

ment costs for medfly may be detrimental to the U.S. competitive position.

Other citrus fruit exported are lemons, limes, and tangerines. Total annual exports based on the 1972-74 average were 5.39, .07, and .28 million boxes annually for lemons, limes, and tangerines, respectively (6). These export levels amount to 23.3, 4.7, and 5.6% of total U.S. production for these fruits. Projected losses of lemons, limes, and tangerines at the 10/5% infestation rate were 709, 108, and 420 thousand boxes, respectively. These losses are greater than average exports for limes and tangerines, and amount to 13.2% of lemon exports. Adequate data are not available to estimate losses that might occur from an embargo on exports of fresh lemons, limes, and tangerines.

Additional Research Considerations

A possible embargo on fresh fruit exports of citrus could take several forms if an infestation did occur. Since citrus is produced in several states, an embargo might be placed on certain states or infected areas. Another possibility would be the banning of all U.S. exports of certain fruits, although only small areas and a small percentage of total production might be infested.

Estimating the effect of a fresh fruit export embargo on a certain state or area would require demand equations by state or area for the fruit. These equations are not available for some fruit which would make a total evaluation of this embargo form impossible. Also lacking for this type of analysis are interstate movement data on fruit since export data by state are not available in adequate detail. Because of these shortcomings, the approach used to evaluate the effect of fresh fruit embargos was to analyze the effects of a total embargo on the domestic market in the form of total revenue losses. This assumes that exported fresh fruit remained in the domestic market and caused price reductions. Seasonal prices and production patterns were not considered.

Summary and Conclusions

The potential costs of a fruit fly infestation of the U.S.

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MARKETING ALTERNATIVES FOR THE FLORIDA CITRUS GROWER¹

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Additional index words. Cash market, forward pricing, futures market, cooperative, participation plan, consignment.

Abstract. The Florida citrus grower has 2 basic methods of marketing his fruit—either he can choose to make an outright sale of the fruit where he relinquishes all interest or else retain ownership through the packing or processing functions and receive a payment based upon the selling price of the final product. This paper will focus on the relative im-

portance of specific marketing alternatives and discuss the advantages and disadvantages of each option.

portance of specific marketing alternatives and discuss the advantages and disadvantages of each option.

The Florida citrus grower has a number of marketing options he can choose for both fresh and processed fruit. The basic decision, however, is to choose between giving up the ownership of the fruit while it is in its raw form or retaining ownership through the packing or processing of the fruit. In the first case, the grower makes an outright sale where he relinquishes all interest in the fruit and its products. This is referred to as priced fruit and comes from the cash market either as spot sales (price at delivery) or forward priced as shown in a schematic diagram (Fig. 1). In the second case, the grower retains interest in the fruit and its resulting products. The payment will then depend upon the sale of the final product and the expenses involved. This is referred to as deferred priced or non-priced fruit and is primarily participation plan or cooperative fruit. Each of the options shown in Fig. 1 has its advantages and disadvantages. They will be discussed in turn.

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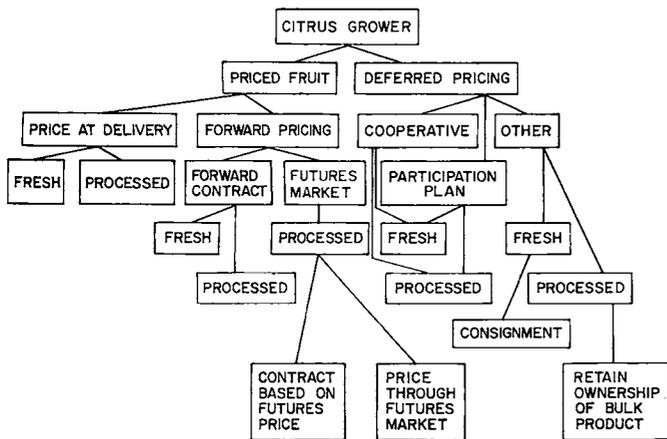


Fig. 1. Marketing alternatives for Florida citrus growers.

Marketing Options

Priced Fruit

Price at delivery. To price fruit at the time of harvest or delivery is to sell in the spot market. This means not committing your fruit to any buyer until harvest time. Spot sales can be made to any buyer needing citrus fruit. These buyers can be processors, fresh packers, gift fruit operators, roadside markets or bird-dogs. The price that is received in the spot market will largely be set by the buyer and will be determined mainly by the quality of fruit offered for sale. The buyer's price is usually related to both the immediate supply and demand for fruit in the local area and to the buyer's particular situation. For example, circumstances may be such that the buyer needs no fruit or is in desperate need of fruit to run a plant efficiently or to meet an order.

At certain times great variation can be expected in the prices buyers offer for spot fruit. Because of this the wise seller will avail himself of the various market information services and conduct his own personal price survey in order to be able to select the best of the various prices being offered.

The payment for fruit priced at delivery is immediate; there is no waiting for pools to close or wait months or years before finding out what the final price is. However, since a home for the fruit has not been assured it may be difficult to get the fruit harvested and delivered at desirable times such as during the period immediately following a freeze. Here the price would be heavily discounted because others are attempting to deliver as much fruit as possible and buyers are offering lower prices. Should the fruit be sold at this time or prior to the freeze, the seller would not benefit in the higher post freeze prices.

It is important to note that this marketing technique would not work to the same advantage if all citrus growers were selling in the spot market. However, growers can gain some control over price because the majority of other growers have committed their fruit to a buyer. Wide price swings in the small uncommitted market are thus likely. When a scarcity situation exists, prices will rise sharply; however, should a surplus situation exist prices may fall sharply.

The second alternative under priced fruit is forward pricing. The crop is presold before it is ready for harvest or delivery. This involves remaining uncommitted until a desirable price is negotiated and then committing your fruit at this price. The options that will be discussed are forward contracting and pricing through the futures market.

Forward contract. To price fruit by executing a forward contract is to agree in advance of harvest to deliver fruit at a designated price. A cash binder advance is usually

made by the buyer at the time the contract is signed. By using this method the grower has the ability to become actively involved in the pricing decision of the fruit, since it is he who decides upon the acceptability of the price to be received. However, this method is preferred only if the grower is fully aware of the economic conditions of supply and demand in the industry.

Knowing something about crop size, movement of processed products, inventories of products and growing conditions can aid substantially in determining an expected return. If the grower is able to strike a favorable price and his conclusions about the economic situation prove correct, then he can indeed be pleased with the pricing decision. If, however, he misjudges the economic situation and price levels rise, he would be justly upset over foregoing the extra return by having contracted at too low a price (1).

Contracts can be negotiated on the basis of pounds solids, boxes, gallons of juice or bulk (all the production from a grove). The grower needs to evaluate which of these pricing units would be best in each individual case. Generally, pounds solids measures the value of product going into concentrate, gallons of juice measures that value of product going into single strength juice and box measures the value of fresh citrus. However, the grower should seek the unit that best compensates him for the individual quality characteristics.

Contracting can be done with processors, packers or bird-dogs. Some contracts can be negotiated so that a minimum price is stated, with provisions for the price to be increased if the cash price rises. Contracts with packers typically call for a specified number of boxes but may also be for the entire production of a grove. In the latter case the fruit is usually purchased on-tree with the packer incurring the cost of picking and hauling. Bulk contract sales can also be made where the grower sells the entire crop on-tree for a lump sum. Should the actual production be different from expected production there is no adjustment and the buyer assumes the risk of any crop damage (e.g. a crop reducing freeze).

The grower is assured of a home for his fruit once the contract is signed with the exact price or minimum and terms of sale known in advance of harvest or delivery. Again there is no waiting for pools to be closed with cash flow position improved by a payment at contract signing and remaining payment at time of harvest or delivery. However, there is loss of flexibility once the contract is negotiated. Should prices improve after the contract is signed, increased income may be foregone.

Futures market. Pricing fruit by hedging in the FCOJ futures market is another forward pricing option. Hedging is limited to oranges grown for processing and can be used most effectively by the grower with uncommitted fruit. Hedging, in its simplest terms, is the establishment of a futures market position opposite to one made in the product market. The orange grower is "long" in the product market since he anticipates harvesting fruit, the value of which is subject to change as prices fluctuate during the season. By taking a "short" position on selling contracts in the futures market promising to make delivery he establishes a price for his product.

Forward pricing through the futures market differs from forward contracting in that hedging implies no original intent to deliver (or accept delivery) on the futures contract. This flexibility is one advantage hedging has over forward contracting where actual delivery must be made. Hedging allows the trader to control the timing of sales or purchases while affording the flexibility to close out a futures position by an offsetting futures trade. Since future contracts are bought and sold on margin additional capital is required.

Hedging works because prices in both the cash and the futures markets have a strong tendency to move up and down together. That is not at all surprising, since both markets are influenced by the same supply and demand conditions. Hedging is the act of taking opposite positions in the 2 related markets. When prices move in one direction, the cash revenue position may sustain a gain or loss, but the futures revenue position will be just the opposite with the result that nothing has happened to the net revenue position, given that no product is lost.

Placing a successful hedge also requires knowledge about the "basis" which is the difference between prices on the cash market and the futures market. If the basis does close, the short hedger will have protected his initial price and will have improved upon it because the 2 prices have gotten closer together. Should the basis stay the same, the original price is locked in no matter what happens to prices in either market.

A strong, definite seasonal trend to the basis has been identified for FCOJ. While the level of the basis may vary from year to year, there is a pronounced downward movement as the season progresses. The basis is also widest at the beginning of the season. Studies indicate that a rather quick and significant decay in the basis coincides with the passing of the freeze season (3).

The grower hedging in the futures market can take advantage of this narrowing of the basis. See (2) and (4) for further discussions of hedging strategies to take advantage of this movement. A good understanding of the basis is necessary prior to hedging since the closing basis is not known with certainty until the hedge is lifted.

Pricing fruit through hedging in the futures market can result in higher fruit prices when the market conditions are right. However, it is necessary to have an understanding of the futures market and the current and anticipated industry supply and demand situation. A grower should only hedge a small portion of his fruit and never more than what he would expect to survive a crop damaging freeze. Should it freeze, pricing through futures will likely result in a lower price (than if he hadn't hedged) and the grower would not want to be in a position of having to buy his futures contracts back at considerably higher prices while not being compensated for increases in the return from the cash commodity because it was lost to the freeze.

Contract based upon futures price. A number of processors now offer contracts in which the price to be received is determined by what the futures price is at time of harvest and delivery. An example of this would be a contract with processor A to deliver 100,000 boxes of 'Valencia' oranges, the price to be 10¢ under the closing price of the nearest futures contract on the date of delivery. The advantage to the grower is that he now knows with certainty his closing basis and he has assured a home for his fruit.

When the current basis greatly exceeds this figure, the grower can place a short hedge, thereby guaranteeing himself a profit from a narrowing of the basis. The grower has priced his product directly when the hedge is placed and the realized price will always be 10¢ under the hedge placement price. So as long as the grower is satisfied with 10¢ under the hedge placement price, it is a no loss situation. The only loss could be an opportunity cost should the grower find that he could have received a higher price if he hadn't contracted and hedged or only hedged.

Deferred Pricing

Cooperative. Cooperative marketing is the extension of the grower's business activity into the packing, processing and selling of his product. When a grower places his fruit

in a cooperative, he is assured that his fruit will have a home. This can be important after a freeze when it is imperative to get the fruit harvested and delivered as soon as possible. Having an assured home is also desirable during surplus crop seasons. The grower is no longer concerned about the timing of his deliveries to receive the highest price. His fruit is pooled with that of other growers and he receives an average price.

The grower can also benefit from the services provided—grove caretaking, picking and hauling, and in some cases, even financial assistance may be offered. The cooperative grower joins with other growers to try to do an effective job of marketing his fruit and its products. In most cases, the grower maintains no control over the price he receives for his fruit, but rather entrusts the management of the cooperative to market his fruit.

The price that the grower receives for his fruit is based upon the selling price of the final product minus the expenses of the cooperative. He shares in the net returns in proportion to his contribution. All fruit of the same variety or utilized in the same end-product is placed in a pool. During the season or selected pool period, the appropriate revenues and costs to be charged to a pool are accumulated. At the end of the season or pool period, the pools are closed and the grower is paid on the basis of his contribution to the pool.

Cooperatives, being owned by the growers, distribute all of the earnings from marketing the members' fruit. Each pool is allocated revenue from sales of the product. All expenses or assessments are charged to the individual pools by methods established by the cooperative.

Participation plans. Marketing through a participation plan includes many of the features described in cooperative marketing. It is usually the private corporation that offers a participation plan, but it may also be offered by a cooperative. Participation plans are contractual arrangements between growers and handlers. They are participation plans because the grower "participates" in the specified returns of the processor. It is also a deferred pricing alternative since the final price is not determined until the pool that the grower's fruit is in is closed.

In general there are two types of participation plan contracts: production contracts, where the buyer takes all of the production for a grove, and limit contracts, where the quantity to be delivered is specified.

Participation plans differ from cooperatives in that there are no retains. When the pools are closed, the grower in a participation plan receives all the money that is due him and is not subject to a retain. The price realized for the product depends upon the returns from marketing the product and the method of price determination or terms of the contract. The grower turns over title to the product at the time the product is delivered. Thereafter it is the packer or processor that markets the fruit or its products in the best manner possible. The marketing decisions do not involve the grower, and seldom does he have any influence upon the pricing policies of the packer or processor. Hence, the grower has no control over the price he will receive, but is placing his confidence in the packer or processor. In addition, the grower remains in the position of being the residual claimant and bearing the risk of price changes since the packer or processor will receive his margin for carrying out his functions, leaving whatever is left to the grower.

The advantages of marketing through a participation plan are those discussed under cooperative marketing. The grower is assured a home for his fruit which is especially beneficial should there be a freeze or extreme product surplus. The grower does not have to be concerned with the

timing of his deliveries to get the highest price but will receive an average price. Should prices advance, because of a freeze, for example, the grower will still share in a portion of the higher prices because the pool average price will advance.

The disadvantages of marketing through a participation plan include no control over the fruit price, the carrying of the price risk during periods of adverse price changes, and having to wait several to many months until the pool is closed and the final payment for the fruit is made. While there may be incremental payments or advances as the fruit or its products are marketed, not receiving an immediate payment at harvest does represent a hidden cost. The grower is in effect passing up a return from investing or the chance to reduce the cost of borrowing money. This opportunity cost can be as much as several cents per pounds solids.

Consignment. The handling deal or consignment is used primarily by the fresh fruit segment of the industry. Here the packinghouse packs the grower's fruit, but the grower retains ownership. The grower receives the market price for the product sold minus the assessed packing and selling costs. Thus, the grower can benefit from high prices or special product characteristics. However, the disadvantages of this method is the possible difficulty of packing and marketing the fruit when it is most advantageous.

Retain ownership of bulk product. The final deferred pricing option discussed is available to the processing segment and involves custom processing of bulk concentrate for later sale. Here, too, the grower retains ownership of the resulting product made from the fruit. The fruit is delivered to the processor who manufactures bulk concentrate and places the product into storage. The grower pays the processor a negotiated fee for bulk processing and for storage and is then free to market the concentrate in any manner he desires. The possible outlets for this product are buyers of bulk concentrate, which could include making delivery against a short position in the futures market.

Relative Importance and Historical Returns of Options

Florida citrus growers have traditionally exhibited a reliance on the non-priced methods of marketing. While detailed data is not available for all fruit utilization, excellent information is available on fruit deliveries in Florida processors.² Table 1 shows the percentages of fruit delivered to processors for use in FCOJ for the 1976-77 season. Priced fruit accounted for 17.7% of deliveries. Fruit on non-priced contracts, which include participation plans, were 28.7% of deliveries, while cooperatives and processor owned fruit accounted for 53.6%.

The percentage of the total deliveries represented by priced fruit has been declining. Fig. 2 shows the percentage of priced and non-priced orange deliveries since the 1960-61 season. Although the absolute number of boxes in the cash market has been increasing, percentages have declined. Dropping from 40% in the 1960-61 season, the priced percentage has fluctuated in recent seasons slightly above or below 20%. Non-priced deliveries have been increasing in terms of both percentages and absolute number of boxes.

In summary, the two basic means of marketing Florida citrus fruit are pricing the product prior to or at harvest and delivery time which is called the priced market or retaining ownership with pricing deferred.

²Because this data is on deliveries to processors, it does not measure the true percentages at the grower level. We should expect a slightly higher figure for priced fruit at the grower level since there are direct sales to bird-dogs that are delivered to processors as non-priced fruit and a greater percentage of fresh fruit is sold in the cash market.

Table 1. Deliveries of oranges for FCOJ Florida processing plants, 1976-77 season.

	Million boxes	Percent
Priced fruit		
Spot	5.1	3.5
Contract	21.0	14.2
Total priced	26.1	17.7
Non-priced fruit		
Contracts*	42.4	28.7
Cooperatives and processor owned	79.2	53.6
Total non-priced	121.6	82.3
Total all fruit	147.7	100.0

*Largely participation plans.

Source: Florida Canners Association.

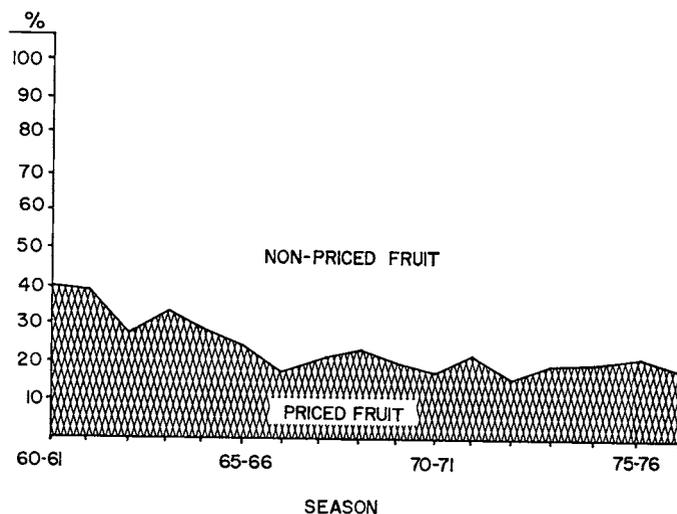


Fig. 2. Percentages of priced and non-priced fruit, oranges for concentrate 1960-61 through 1976-77 seasons.

In general the priced market is the most risky as the grower remains uncommitted until he decides to price his product, while the deferred pricing methods are less risky since a home for the grower's fruit has been assured and the grower receives an average price over a designated period. From a return standpoint, the preference of option will depend upon being in a surplus or scarcity situation.

In large crop years when inventories build up, or immediately after a freeze, there is little demand for the uncommitted product. The cash market becomes extremely depressed. In these years it is better to be in a cooperative or participation plan as prices will likely be higher.

In small crop years, or when excess processing capacity exists, the uncommitted seller benefits since the shortage of the product makes his product more valuable. The cooperative or participation plan grower still has his fruit committed and will benefit from the price increase, though not to the extent the cash grower will.

From a historical viewpoint, on the average, the returns would have been better being in the priced market. While deferred pricing averages are not published, cash prices for oranges going into processing are published by Florida Canners Association and Florida Crop and Livestock Reporting Service published an overall average price for processing oranges. Thus, an average non-priced return can be derived.

Studies of the seasonal averages from the cash market and the derived non-priced fruit averages for all oranges

from the 1960-61 season through the 1975-76 season, show the average cash price exceeding the average non-priced return in 11 out of 16 seasons. Cash price averaged 47.0¢ per pounds solids (p.s.) while non-priced averaged 44.8¢/p.s. However, year to year variance was considerably greater in the cash market with the standard deviation of the cash averages being 13.9¢ while the standard deviation of the non-priced averages was 12.4¢. Similar analysis by variety reveals that over the period 1963-64 through the 1975-76 season in 8 of 13 seasons for early and mid-season oranges and 10 of 13 seasons for 'Valencia' oranges, the average cash price exceeded the average non-priced processing return. The means and standard deviation (shown in parenthesis) in cents per p.s. were for early and mid-season, 44.4 (15.8) and 42.4 (12.0) and for 'Valencia', 48.1 (13.6) and 44.2 (11.7), respectively, for cash and non-priced.

It must be emphasized that this discussion has been concerned only with averages. There will be returns from co-operatives and participation plans that are above and below the averages, just as there are cash prices above and below the average cash price.

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ECONOMIC ANALYSIS OF STRATEGIES FOR RESETTING CITRUS GROVES

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Abstract. A computer routine is available through the Florida Cooperative Extension Service that evaluates the economic return to a strategy of resetting citrus trees. Decisions in the strategy are based upon the annual expected net return prior to incurring planting and young tree costs. The user inputs his anticipated tree removals over the coming years and the computer program calculates removals and the number of open spaces year by year. Resetting occurs when the expected net return, including planting and care costs, is positive. Should revenues not be sufficient to cover planting and care costs then no resetting occurs. The computer program is interactive and allows a grower to analyze his own situation—variety, number of trees per acre, average age of trees and yield, and the basic level of grove care costs per acre.

A citrus tree is a working asset and a means to replace that asset must be developed. Furthermore, with the continuing increase in the grove care costs, it is important that every tree space be kept productive.

The grower needs to inspect his citrus trees periodically and keep accurate records of the yield condition of questionable trees, and costs. Orderly replacement of non-productive trees must be planned for, but at the same time flexibility maintained. The grower should also budget a cost for the replacements in each year's financial planning. This budgeted amount can be compared to the "sinking fund" which most non-agricultural businesses establish to replace capital assets. It will allow a given amount of funds to be assigned to replace trees that are removed from a grove.

This paper provides a reset analysis method which a grower can utilize in developing his own tree replacement program. The advantage of this approach is that a grower's individual situation can be readily analyzed since a model is developed of his grove. The grower can compare several resetting strategies with respect to his estimated costs and returns. The end result will be a method by which the grower can better determine the amount he needs to budget each year.

Computer Program Analysis

A computer program is available to analyze resetting strategies. The computer program is designed to calculate, on an annual basis, the net return from a strategy of grove resetting. The overall sequence of the program is shown in Fig. 1. After the signing on to the computer, accessing the program and initiating the run, the user (grower) is asked a series of questions about his own grove situation. He is asked to input the variety (see Table 1 for the varieties), number of trees per acre, average age of existing trees, the average yield of existing trees, and the number of years to run the analysis. The maximum number of the latter is 30 years.

The yield function (yield by age of trees) for the variety is then selected. Two yield functions for each variety are stored, so that the yield varies according to the number of trees per acre (density). The functions internally stored are a slight modification of Savage's average yield per tree by age and variety (2). Next the grower inputs his basic grove care cost per acre. This cost should include all production costs such as fertilization, spraying, cultivation, irrigation, etc. and fixed costs such as land taxes and insurance. This figure should not include cost of resetting or young tree care, which is the next cost to be inputted. The estimated costs of removing, replanting, and caring for the reset trees through four years of age are internally stored with the costs used in the analysis process shown in Table 2. These costs were calculated from information provided by citrus nurserymen and production managers (1). The costs are presented with respect to the number of trees per acre.

For a given analysis, the user supplies information on his