ECONOMIC ASPECTS OF STONE FRUIT MARKETING IN NEW ZEALAND

by

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INTRODUCTION

New Zealand stone fruit constitutes a multi-million dollar industry. Possibly because the industry exports very little in either value or quantity terms little work has been completed in this industry. Little is known, quantitatively, about the market forces which operate within the industry. This study is an attempt to measure the forces operating within the New Zealand market for stone fruit.

So little is documented of the industry that it is highly desirable that chapter one of this study examine the broad outline of the sales methods available, where the product is produced and the distribution and sale post wholesale.

Chapter two then examines in detail the quantities of apricots sold through the channels available. This basic data was obtained by questionnaire and provides also a fuller insight into grower reasons for supplying their present quantities of fruit to each outlet.

Chapter three is devoted to the development of economic theory so that a demand study for stone fruit can be undertaken. This basic framework is employed in chapters IV and V where annual and daily marketing is considered.

In chapter IV an attempt will be made to predict the annual industry price and using this as a basis, future projections will be made.

In chapter V an attempt will be made to predict daily price. If daily price can be predicted, then growers should be able to

develop successful marketing strategies.

Chapter VI considers these marketing strategies and how they can affect the price for his whole crop in any year at auction.

Chapter VII describes the auction system as it is at present and considers some aspects of its operation.

Chapter VIII considers the method of sale which is commonly considered by many present members of the industry to pose a threat to the livelihood of small growers and present wholesaling firms alike.

The chapter then considers the improving of the present wholesaling system and concludes with a review of what the work has achieved, making suggestions for further work.

My original brief on this study required me to study "ring buying". Ring buying is the practice of one man buying and then splitting his purchase among other buyers. Therefore all "group buyers"*, and commission buyers** and the auctioneer practice [3]*** which continues today of auctioning the line once and then selling to numbers of buyers (some of whom are "group buyers") at the same price is ring buying. An analysis of buying power is presented in Table 7.1.

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* Group buyers purchase for a chain of stores in the same retailing group.

** Commission buyers buy for a large number of retailers who may or may not be members of a retailer group.

*** It should be noted that all symbols of the form [ ] refer to a reference in the References page 89.

CHAPTER I

MARKET STRUCTURE OF THE STONE FRUIT INDUSTRY IN NEW ZEALAND 1971

The purpose of this chapter is to acquaint the reader with the general market structure of New Zealand's stone fruit industry at the 30 January 1971.

1.1 GROWER MARKETING

Stone fruits are a perishable commodity.

Most stone fruits with the exception of cherries and some fruit sold in Wellington are transported by rail. The exceptions travel a part or all their journey by air. The rail/air service allows fruit consigned to Wellington to be sold a day earlier than its competitors travelling by the Picton/Wellington ferry. The greatest time lag for fruit from any part of New Zealand to any other part by normal rail transport is three days.

The marketing system for stone fruits in New Zealand is very liberally serviced with auction establishments. Forty-seven auction establishments, plus five firms selling by private treaty, distribute growers consignments.

Major supply regions are geographically separated from the auction centres (diagram 1.1). Marketing is chiefly conducted through auctions and processors. These two markets compete for

stone fruit, and the strength of any price relationship between these will be studied.

There are very few regulations governing stone fruit sale in New Zealand by the grower. The fruit must conform to Health Regulations and be fairly packed. Apart from these regulations the grower may market his fruit as he pleases. He must however, market quickly as his product has a maximum cool store life of 14 days and must be marketed promptly after removal from storage.

1.1.1 Sale by Producer

The producer has several methods of selling his product. He may choose any of the following six methods. The first two of which are the major methods of sale. Ninety-six per cent of the fruit being sold through them.

(a) Forward to the Central Marketing System for sale by auction (predominantly) with no reserve.

(b) Sell to a Processor at a negotiated price. Negotiation is between producer organisations (at a local level) and the processors, the price being announced well before fruit maturity.

(c) Sell "Direct" to the retail system. Such sales are negotiated between the retailer (or retail group) and the individual producer or producer group. Negotiations to date have been direct between buyers and sellers.

(d) Sell by "Mail Order". This title covers the

numerous methods by which orders are received. The fruit is dispatched by public transport directly to the consumer.

(e) Sell "Off Farm". In this case the fruit is uplifted, usually by the consumer, from the grower's property, packing shed, or stall.

(f) Export. Exporting is in its early stages. It is hampered by transport difficulties and severe quarantine regulations. Some increase has occurred in the last three years. Export supplies are generally negotiated between the exporter and the producer. The fruit generally being supplied at a set price.

1.1.2 The Central Marketing System

There were 60 wholesaling establishments operating in 1970 of which 47 offered an auction floor for stone fruit. Five sell stone fruit by private treaty. Of the 60 wholesalers there are a number of "Order", "Supply", or "Country Order" companies, usually subsidiaries of auction companies providing a distribution service for buyers not attending auction. Prices asked by these secondary wholesalers are generally based upon the auction price of the day.

Evidence will also be presented in Chapter IV to show that the auction, as the major link between growers and retailers of fresh fruit, is thus a key element in the present marketing system and will also indicate that it is the price which a grower expects to obtain

at auction which largely determines how much fruit he supplies to the processor.

1.1.3 Processors

The processing of stone fruit is carried out by several firms in New Zealand. All the processing firms offer the same fruit price. Some competition occurs amongst processing firms through setting and interpretation of the top grade standard. Processors would take more fruit if it was available and they could plan for its arrival. The method of processor purchase is described in Chapter II, paragraph 2.4.5.

Unfortunately the processors are often called upon to take fruit at short notice when the auction price falls. As this happens to most growers simultaneously, and because stone fruit cannot be cool-stored for more than 10-14 days, the processors may sometimes be unable to accommodate the glut.

1.1.4 Direct Sales

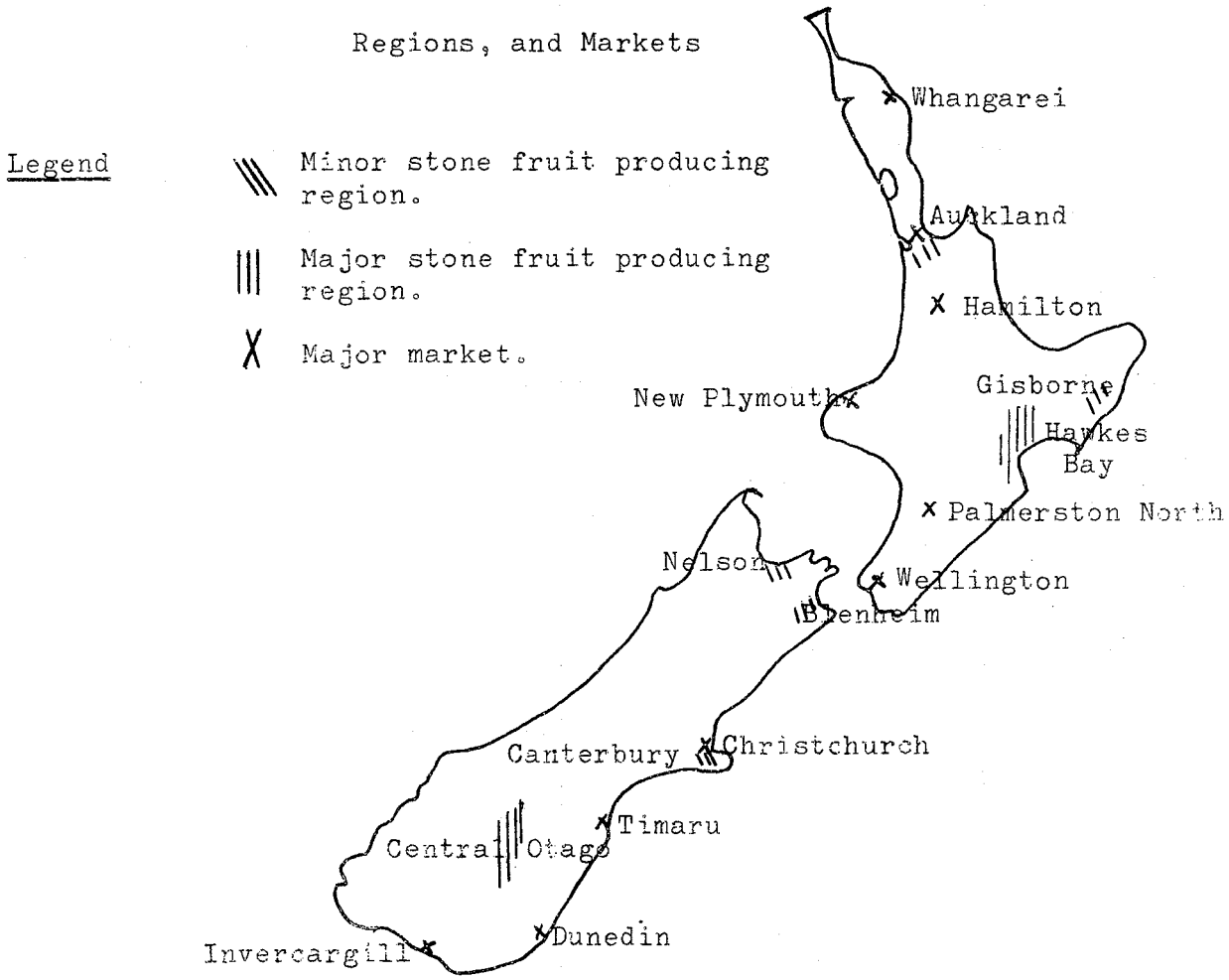
Direct selling is sale by grower to retailer without an intermediary. Direct selling has become a controversial issue in stone fruit politics. The quantity of fruit that is sold direct is relatively small (see Table 2.1) but fears that the auction system will be undermined are widespread. Direct sellers and direct buyers claim many advantages for the practice. Direct selling and its effect upon stone fruit sales will be studied in Chapter VIII.

1.1.5 Other Sales Outlets

The absolute quantity of fruit sold through these channels is so small that they cannot greatly affect the prices for the bulk of the stone fruit crop. Little further mention will be made of these methods.

Diagram 1.1

Geographical Distribution of Stone Fruit Producing Regions, and Markets



1.1.6 Production Concentrations

The reasons for the above geographic concentrations of production regions are believed to be based upon the considerable

comparative advantages that certain sites gave to the historical stone fruit grower.

Central Otago with its low summer rainfall, extremely cold winter and somewhat frost free spring, was able to produce stone fruit with a low level of infestation of brown rot (Monolinia). This gave their stone fruit good shelf life. The climate also allowed for long economic tree life - a few economically viable trees were 80 years old in 1969.

Hawkes Bay developed because the good soils and warm climate allowed stone fruit growers to produce heavy crops of fruit from young trees.

The small areas in Canterbury and Auckland developed to supply the needs of their local market. Today these orchards are still primarily satisfying this demand.

1.2 DISTRIBUTION AND SALE

From the central marketing system, fruit may be bought by anybody. The retailer, commission buyer or agent, are the major buyers at auction.

1.2.1 Distribution

Diagram 1.2 illustrates the interrelationships between the various elements of the distribution system for stone fruit.

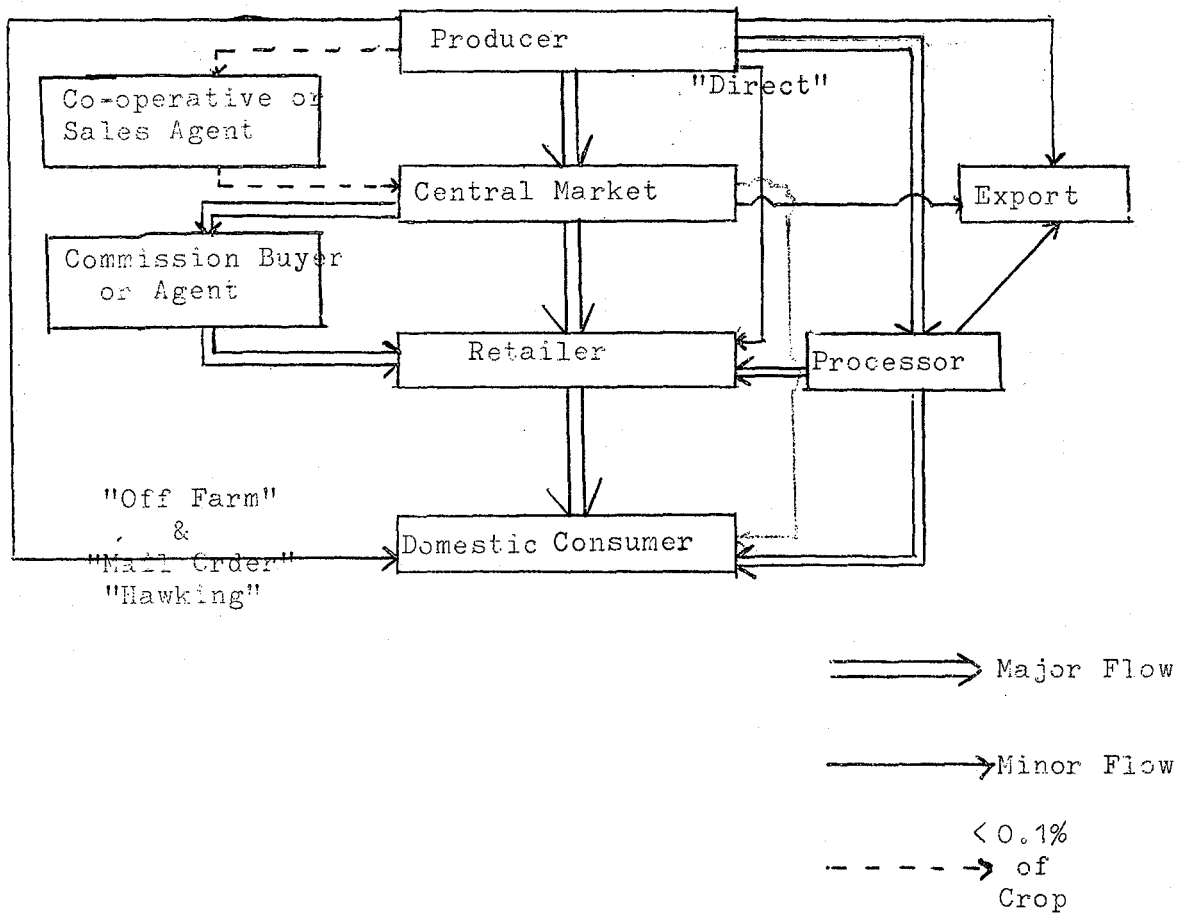
The market distribution system is a very simple one compared with overseas systems. In America sale to an intermediary may occur preharvest, on the orchard, on rail, direct to the retailer, direct

to the public, to a co-operative or agent, export or to the processor.

Diagram 1.2

Stone Fruit Marketing Flows in

New Zealand



The New Zealand system is simple in comparison. The decision by the grower as to sell to market or to the processor is made on the farm, often when the fruit is virtually ready for harvest.

In New Zealand there is little direct force requiring a grower to act as a salesman.

This function is usually performed by the wholesaler.

1.2.2 Retailing

Retail outlets for stone fruit in New Zealand are:

(a) Auction markets

(b) Supermarkets

(c) Fruiterers

(d) Super Fruiterers

(e) Grocer Dairies

Kitson [1] has defined and studied b,c,d, and e.

The amount of fruit retailed by auction firms amounts to a very small proportion of the total turnover. An exception to this generalisation occurred on December 24th 1969. The market firms used advertising to entice the public to the markets in sufficient quantities to influence the price.

CHAPTER II

PRODUCER SURVEY

In order to improve our knowledge of the stone fruit marketing system it was decided late in 1968 to undertake a questionnaire survey by interview.

The objectives of this survey were to establish

(i) The proportions of fruit marketed through the channels available.

(ii) Growers experiences with different marketing systems and their views as to advantages and disadvantages of the outlets.

Apricot marketing was selected for the survey for several reasons.

(i) Apricots are used and marketed in a similar manner to other stone fruit.

As with other stone fruits, apricots may be used fresh or in a culinary manner. Some varieties are more suitable for one purpose than the other and some have multiple uses. For example, Newcastle apricots are mainly used fresh while the Moorpark variety is more versatile as it can be used for jam, preserving, conserve etc.

Apricot marketing parallels other stone fruit marketing. Apricots are sold via the auction system, to the processors, off farm, by mail order, direct to retailers and exported.

(ii) The apricot is a clearly defined product easily traced through auction firm records, produced commercially in geographically defined and confined regions in New Zealand.

Grower response to the questionnaire was excellent, all growers who were contacted co-operating. (See Appendix I for a copy of the questionnaire.) The survey was conducted during the first two weeks of January 1969.

2.1 THE SAMPLE

Preliminary work before the survey indicated that it would be possible, working within the time budget available (two weeks), to interview almost all the growers of apricots in the Clutha Valley. A list of growers was compiled, using the author's local knowledge, the local producer bodies, and Horticulture Division's (Department of Agriculture) Officers in the region.

The survey consisted of a personal interview with each Grower/Manager.

Apricot growers were interviewed in the Clutha Valley and surrounding areas between Millers Flat and Lowburn. All areas between these points were surveyed. One hundred and sixty nine growers were contacted. These growers market from 772 bearing* acres which is approximately 94 per cent of the apricot producing area in Central Otago and almost 80 per cent of the Dominion total

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* The distinction is here made between bearing and non-bearing orchard. The age distribution of an orchard is most important when marketings from the area are considered.

at the time of survey.

2.2 ANALYSIS OF THE QUESTIONNAIRE

Question one established the size of the apricot sector of each orchard. Item two in the questionnaire was an interviewer's rating of the orchard. The purpose of this was to check that the results as recorded were reasonable. In two cases confirmation of the accuracy of data was required. Question three established the individual methods of sale and Question four and four(a) gave the individual quantities and proportions of fruit sold by each method.

Strenuous efforts were made at all times to reduce "Interviewer error" [5]. Questions were asked which forced the respondent to supply his own unbiased answer. Attempts were made to eliminate suggestion by the interviewer.

Code Cards were used by the interviewer in appropriate places to speed up the recording of answers.

Analysis of the results was completed manually as the author considered that the time involved in coding the data, writing, debugging and testing a computer programme would have been greater than that estimated as being required for manual analysis.

2.3 RESULTS

The quantities of fruit sold via each channel are expressed as a percentage of the total fruit sold from each of three geographically distinct areas. "Cromwell", "Alexandra", and "Roxburgh".

The "Cromwell" district included all Northern areas surrounding Cromwell. (Ripponvale, Lowburn and Bannockburn.) "Alexandra" included the Cromwell Gorge, Clyde, Earnscleugh, Conroys Gully and the Manuherikia. The "Roxburgh" area included all areas south of Fruitlands in the Clutha Valley to Millers Flat.

The survey results from each of the areas required weighting before production of the total figures was possible.

A slightly different proportion of the productive area was sampled in each district. The results were therefore scaled up to the full acreage for each area. This step relies upon the assumption that the unsampled area produces in exactly the same manner as the sampled area. When the random sample size is considered this assumption appears reasonable.

The absolute quantities were then converted to percentages, which are shown in Table 2.1 - Results of Producer Survey.

Table 2.1

		Fruit Sold by Each Method					
District	Surveyed Acres	Auction	Process	Off Farm	Mail	Direct to Retail	Others & Export
Cromwell	67	95.8	0.2	1.1	1.2	1.7	-
Alexandra	424	83.4	12.2	2.1	0.6	1.4	0.3
Roxburgh	281	32.0	65.1	1.4	0.7	0.6	0.2
		% of Total Central Otago Crop Sold by Each Method					
		65.8	30.2	1.7	0.6	1.5	0.2

1968/69 was a light crop year. The survey was conducted just prior to the commencement of the picking season.

While the results apply to the 1968/69 season, they do not necessarily apply to a heavy crop or an extremely light one.

The survey is consistent with the annual statistics produced by Horticulture Division, Department of Agriculture, 1969. Table 2.2 compares the results.

All quantities in bushels.

Table 2.2

Sales Channel	NZDA Statistics		Survey Results
	All New Zealand	Otago	Otago
1. Process	63,100	63,100	63,250
2. Auction	-	-	138,200
3. Off Farm	-	-	3,580
4. Mail	-	-	1,260
5. Direct	-	-	3,160
6. Others & Export	-	-	420
Sum of two to six	177,450	147,250	146,620
Total Production	240,550	210,350	209,870

2.4 RESULTS, THE REMAINDER OF THE SURVEY

2.4.1 Growers' Opinions

Appendix II gives the detailed results of the survey. The survey was designed to obtain each grower's opinion of the

advantages and disadvantages experienced when selling by each of the methods tabulated in Table 2.2.

This information is most important, as an insight was gained into the factors which cause a grower to choose a particular marketing pattern.

It will be demonstrated that it is the sum of an individual grower's opinions gained by experience which cause him to choose a particular marketing pattern.

The industry action is the sum of the individual grower's actions and reactions to the marketing situation (which is in a state of continual flux) during the marketing season and from season to season.

2.4.2 The Auction System : General

Question five sought information on advantages and disadvantages of selling by this method.

Selling at auction is informal and depends to a large degree upon the mutual trust of the producer/supplier and the auction firm. The producer is supplied with labels from each firm which wants to do business with him. Personal visits to orchards by auctioneers to cultivate business occur in November/December. The auctioneer attempting to obtain promises of a greater share of the coming crop and leaving his firm's labels. The label identifies the grower, has distinctive colouring and clearly indicates the destination.

When the grower wishes to consign fruit to a firm he takes that firm's label and affixes them to each container in the consignment. Other methods such as stamps and private labels are sometimes

used.

No advice is sent to the market of pending arrival, consignment size or any other data which might help in "price discovery" [6].

When the consignment arrives at the market it is entered into the firm's books. When sold the grower may be sent a telegram, at his expense, giving a price summary. Later an "Account Sale" giving the number of cases and prices is sent to the grower. Some firms show the prices obtained for each grade. Later the grower receives a cheque for the consignments in the period. (Payment period is usually two weeks.)

Pilfering and loss of fruit during transit is sometimes a problem. Claims against the Railways and transport firms are made by the auction firms. The grower has no check that the gross price he obtains for his fruit is the price paid by the buyer.

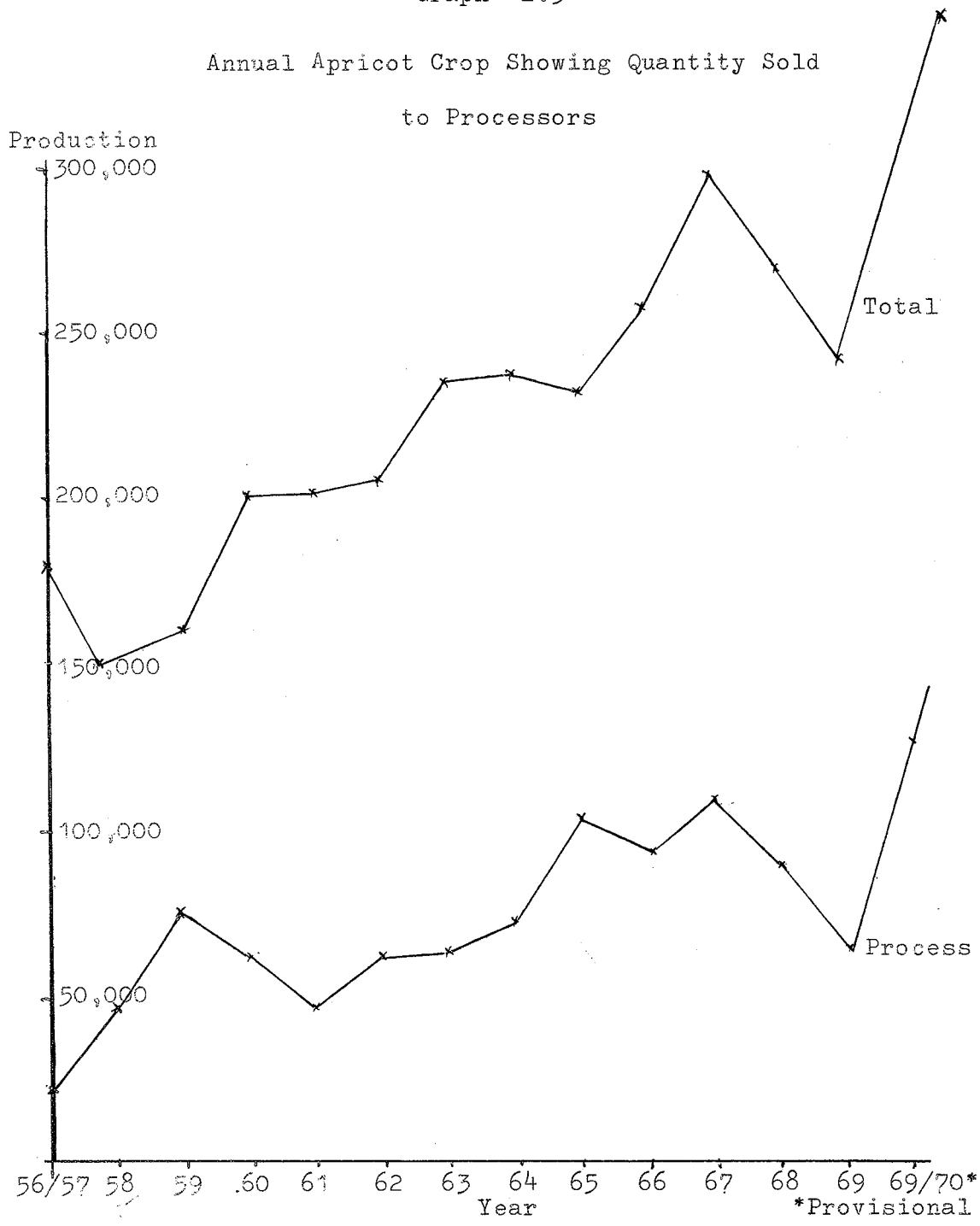
Graph 2.3 shows the annual crop of apricots and the proportion supplied to the processors.

Table 2.1 shows that the total sales from auction plus processing amounted to 95.6 per cent of the apricot crop in the 1968/69 season.

It is therefore clear, that any significant increase in supplies to the processors will reduce consignments to auction.

Graph 2.3

Annual Apricot Crop Showing Quantity Sold to Processors



Source: Department of Agriculture Statistics.

The following are the prices at which the processors bought apricots. All prices in cents.

Table 2.4

Processor Prices Paid

Year	Price for first grade per lb	Price for second grade per lb	Remarks
1960/61	4.375	2.708)	
1961/62	5.000	3.333)	Price
1962/63	5.000	3.333)	at
1963/64	5.209	3.543)	Rail
1964/65	5.209	3.543)	
1965/66	5.416	3.750)	
1966/67	5.416	3.750)	Farm
1967/68	5.42	3.42)	Gate
1968/69	5.67	3.67)	Price
1969/70	5.55	3.55)	

Note that in 1968/69 when the crop was predicted to be low by the Horticulture Division in late November, the processors buying price was raised in an attempt to secure a greater share of the crop.

Graph 2.3 shows that this attempt was not successful in obtaining a significant increase in relative supplies.

2.4.3 Auction system - Advantages; and a misconception

Some growers have a false impression of the price which must be obtained from the market to break even with the processor price.

When the average line is sent to the factory, 90 per cent is first grade and 10 per cent second grade. Using Table 2.4 we obtain a farm gate price for processor fruit of 5.55 cents/lb or $1.17 for 20 lb case. Consider a Central Otago grower marketing

in Christchurch; he will incur costs in addition to those he would incur when supplying a processor.

Table 2.5

1969/70 Marketing Costs not Incurred when Sending to Factory for Processing

	Cents
Grading & packing	9.20
Materials	27.00
Cartage to rail	3.00
Railage - Christchurch	12.45
Cartage to market - Christchurch	3.00
Commission (sale price $2.20)	22.50
Others	2.00
	79.15 cents

At a price of $1.94 per 20 lb case, the extra costs of sending to auction total 76.25 cents for an average grower. Therefore, at a gross price of $1.94 the grower receives $1.18 compared with $1.17 from the processors. Unless, in Christchurch, a grower can expect $1.93 or more per 20 lb case he should send his fruit to the processors. The comparable break even price in Auckland is $2.52. Each market town in New Zealand has its own break even price. These will vary with the transport costs and the factory price.

Note at $1.93 the grower receives no return for the risk involved in fresh marketing.

In the 1967/68 season approximately one third of the panel (chapter I) received an average price for their market crop below the break even prices ruling them. These growers were losing money.

A large percentage of the growers (Appendix II) suggested that the first advantage of the auction system was that they obtained a higher price.

The evidence above suggests that some growers are not getting a better price than they would get from the processor.

But many growers do receive a premium for quality, earliness and superior presentation of their product. Other advantages of the auction system are listed in Appendix II.

2.4.4 The Auction System - Disadvantages

Fifty-seven per cent of all growers who market by auction listed as their biggest problem the lack of information with which they have to make the daily marketing decision "Where should I market my fruit, and in what quantity?".

There is no grower co-operation to establish market intelligence The growers market independently. The result is the violent quantity fluctuations observed in Chapter V.

Most growers listed price fluctuation as the major disadvantage of the system.

In 1968/69 and 1969/70, 80 per cent of Roxburgh's apricots were sent to the processors. Roxburgh fruit matures later than fruit from the Alexandra and Northern areas. Also with a heavier rainfall it is sometimes more prone to brown rot. Growers in this

region supply the processors because they consider the price is too low at auction, and it fluctuates too much. Also auction marketing requires more time and working capital.

Note that in 1968/69 they thought that the auction was a better paying proposition than in 1969/70. The crop was going to be light most growers thought, and as Chapter IV shows they supplied the market too heavily.

2.4.5 Selling to Processors : General

Processing includes all fruit sold for manufacture.

Sale to processors follows a set pattern. Prior to harvest the grower contacts the processor and obtains some of the firms "dumps". The "dump" which is a large case, has the firm's brand on the end. The grower picks the fruit and sends it to the factory, either orchard run (straight off the tree) or he grades it and takes a premium grade for market. He affixes his label on the box and sends them to the factory.

The factory grades the fruit (if necessary) and pays out on their grading at the negotiated price for the season. All processors pay the same price but "competition" occurs between factories because growers quickly learn who are grading the easiest and attempt to supply that factory.

When a grower wants to supply more fruit to the factory he asks for more dumps. If his fruit is wanted by that factory they will send the dumps. If the processor doesn't want the fruit (a circumstance which occasionally arises) they don't send dumps.

2.4.6 Selling to Processors - Advantages

The major advantage listed was that the grower received a better price. The auction sellers also claim this advantage.

The two statements are compatible (after allowing for the misinformed statements previously mentioned). A large proportion of fruit sold to processors is grown in Roxburgh. This fruit ripens in the middle of the selling season, and is therefore being sold in the heaviest supplied period on the markets. Prices are therefore low. Roxburgh receives more rain than Alexandra and is therefore more susceptible to Brown Rot. (Monolinia laxa and Monolinia fructigena.) It is therefore quite correct to say that for this fruit the factory pays a better price than the market would.

Some growers now have orchards which do not have the facilities to market their fruit at auction. These growers consider that reduced working capital, overheads and lower capital costs of establishment, further increase their advantage over auction selling.

2.4.7 Selling to Processors - Disadvantages

There were few disadvantages seen in supplying processors and the system appears to have very few problems.

Some growers considered that better liaison between processors and producers would help improve relations and might give a slight increase in the proportion of the crop which the processors receive.

2.4.8 Off Farm, Direct Selling, Mail Order, Others & Export

A very small percentage of the national crop is sold through these channels.

If the question "Why doesn't the volume of apricots SOLD increase?", is asked of each outlet, the following answers are deduced from the survey results.

2.4.8a Off Farm (Gate Sales)

Gate sales are restricted to their current level because the geography is such that little traffic passes many of the orchards. Bad debts, competition (price cutting) the extra work requirement and disappointed customers, outweigh the advantages to the individual orchardist.

2.4.8b Direct Sales

Direct sales are sales made by negotiation between the producer and a retailer. The fruit is bought under the agreement and consigned directly to the retailer. At no time does an auctioneer, or broker, handle either the fruit or the sale thereof.

Direct sales are restricted to their present level by grower fear "of undermining the auction system". Chapter VIII will consider the validity of this fear.

2.4.8c Exports

The export trade in 1970 was attempting to establish contracts for supplying of fruit in considerable quantity. The frost wrecked these plans but if suitable markets can be re-negotiated then fruit will be sold through this channel. This outlet will have all the benefits of selling to a processor plus the benefit of an excellent price premium to the growers of a quality product.

A second advantage recognised by the growers is that a quantity

of fruit removed from the market will help raise the prices.

2.4.8d "Others"

"Others" included miscellaneous sales outlets such as hawking, which are of such little significance and potential as to not warrant comment.

2.4.8e Mail Order

This method of sale is not being increased because few growers can see any benefit to themselves from such a system.

We have considered how apricots and other stone fruit are marketed in this chapter and have also considered some grower reasoning for their actions when marketing.

The auction system of sale is such that a grower has very little information with which to make his decision on where to send his fruit. While he can saunter around the Railway yards keeping his eyes and ears open sizing up the other producers actions, and while he can meet other growers, workers, truck drivers and exchange quips, lies and information, the only real piece of information which he has is his telegram from the markets.

Some firms are now employing agents in producing districts to dispense market information during the season.

CHAPTER III

THE FIRM AT AUCTION
THE PARTICULAR CASE OF NEW ZEALAND STONE FRUIT

As a prelude to the closer study of stone fruit marketing arrangements, it is necessary to consider whether these arrangements can be studied within an existing theoretical framework.

To this end the suitability of the theory of perfect competition was considered as a framework to consider stone fruit marketing within.

3.1 PERFECT COMPETITION AND NEW ZEALAND STONE FRUIT

It is an economic axiom that for a good to have a price, it must be useful, and scarce in relation to the uses to which people wish to put it.

There are occasions recorded when stone fruit at auction have had no price. (Under these conditions the grower is paid for the container and debited for the cost of dumping the fruit.) These occurrences are rare. In general we can accept that stone fruit has a price.

Stone fruit prices are generally per pack. For example $X.YZ per 20 lb case. A 20 lb case <u>does not</u> have to hold 20 lbs of fruit. Common packs are $\frac{1}{2}$ case (20 lb), $\frac{1}{4}$ case, tray (single

layer pack).

3.1.1 Homogeneity

Homogeneity is the requirement that all units of the product be the same. A quick glance over any auction market reveals that stone fruit are graded into a myriad of non standard grower grades. Stone fruit and particularly apricots, produced in New Zealand are from a group of horticultural products characterised by simultaneous joint production of similar products of different unit value (all other things being equal). Apricots and stone fruit are therefore, each generic products. (Generic means containing a number of closely related species.)

3.1.2 Divisibility

Divisibility requires that the product can be bought in large or small lots at the same unit price. This assumption can be accepted provided that, during any particular time period, no more can be bought than the total quantity of the particular line offered. The final bidder at auction can buy all or one unit of the line offered. If however, a grower supplies a line of too great a size he will push his own price down.

3.1.3 Pure Competition

Pure competition is characterised by atomistic buyers and sellers and requires that no artificial restraints be placed upon demands for, supplies of, and prices of goods and resources, that mobility of goods and services is free.

Ridler [3] concludes that buyers are not atomistic. It

can be accepted that demands for, supplies of, and prices of goods and resources are largely free from interference.

Mobility of goods and services through the market is not free. Kitson [1] p.19, describes the system whereby Fruit Distributors Ltd. is restricting entry of new marketing firms into the business and sheltering firms from the full effects of (as yet unproved) more efficient methods of distribution.

3.1.4 Perfect Knowledge

It can be said a priori, by the very fact that there are often gluts on some stone fruit markets and simultaneous scarcities on another throughout New Zealand, that knowledge is imperfect. Imperfect knowledge is also manifest by the considerable price variation in the one town for the same line on different market floors.

It must be accepted in the light of this chapter so far, that any attempt to constrain this market into the perfect framework would be most unrealistic.

The theory of imperfect competition may be more helpful.

3.2 IMPERFECT COMPETITION AND NEW ZEALAND STONE FRUIT

3.2.1 Generic Products

The type of product that naturally occurs in a variable state of quality (value) has several characteristics affecting demand and price per unit. Quality is a function of colour, appearance, flavour, shelf life, packed weight, wastage rate, cooking ability, size. These factors are inter-related. For

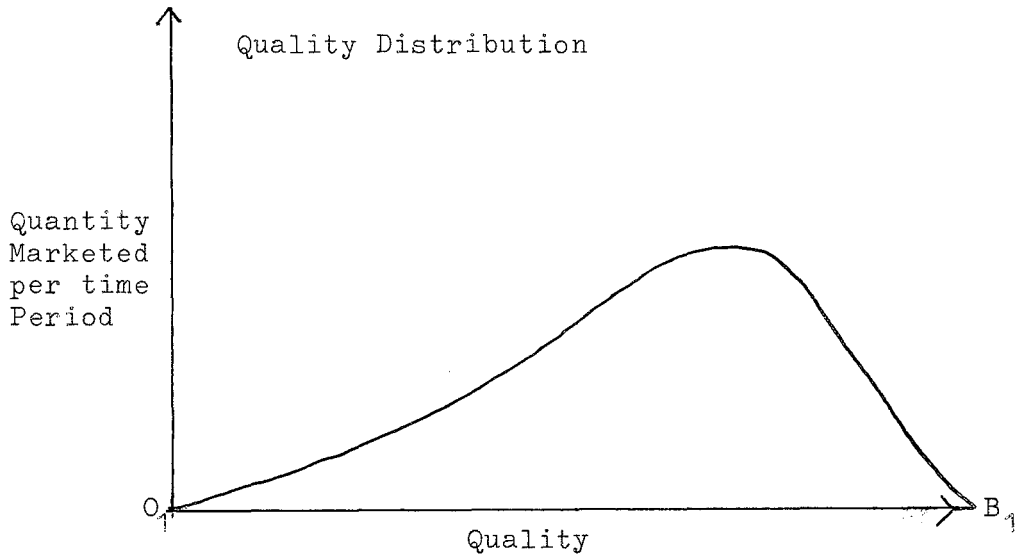
example size, flavour and colour all change with maturity. A very mature fruit at harvest has maximum size, flavour and a brief shelf life, compared with a slightly immature fruit having a longer shelf life and slightly less flavour and size.

3.2.1a Quality Variations

In stone fruit there are a very large number of species of the same product, a continuous gradation of quality can be assumed.

It can also be assumed, because cultural techniques are aimed at producing the maximum quantity of the highest grades, and from growers pack out data, that the resulting distribution will be of the form in Graph 3.1.

Graph 3.1



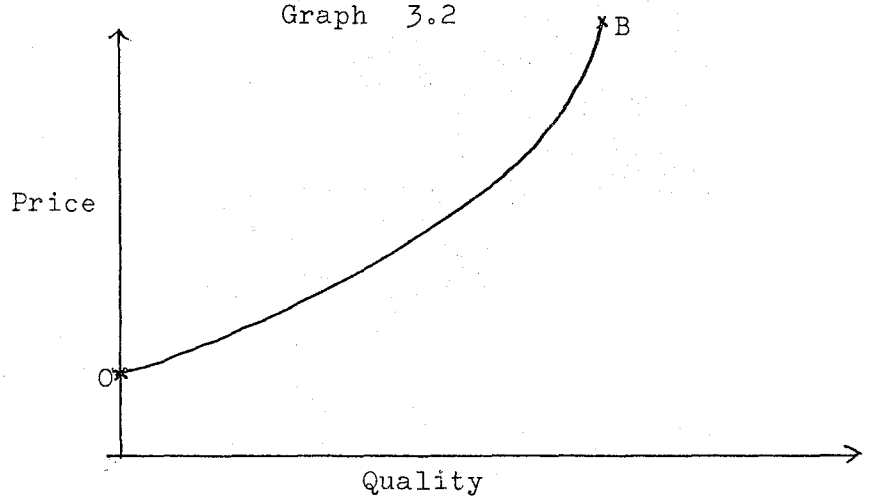
O_1B_1 is skewed to the right as it is grower technique to obtain as high a proportion of quality fruit as possible.

The physical quantities marketed of best and worst quality are low.

Consider a day when the average price for apricots is a.

The relationship between quality and price can be postulated as in Graph 3.2.

Graph 3.2



Although no study of quality difference and the prices received has been made, <u>significant</u> (P = 0.10)* differences do exist between prices for different growers similar size lines. Better graded lines of more attractive appearance command a premium over similarly sized lines with a greater grading deviation from the average size, and less attractive appearance. With this evidence we can state that OB should be a curve running upwards to the right.

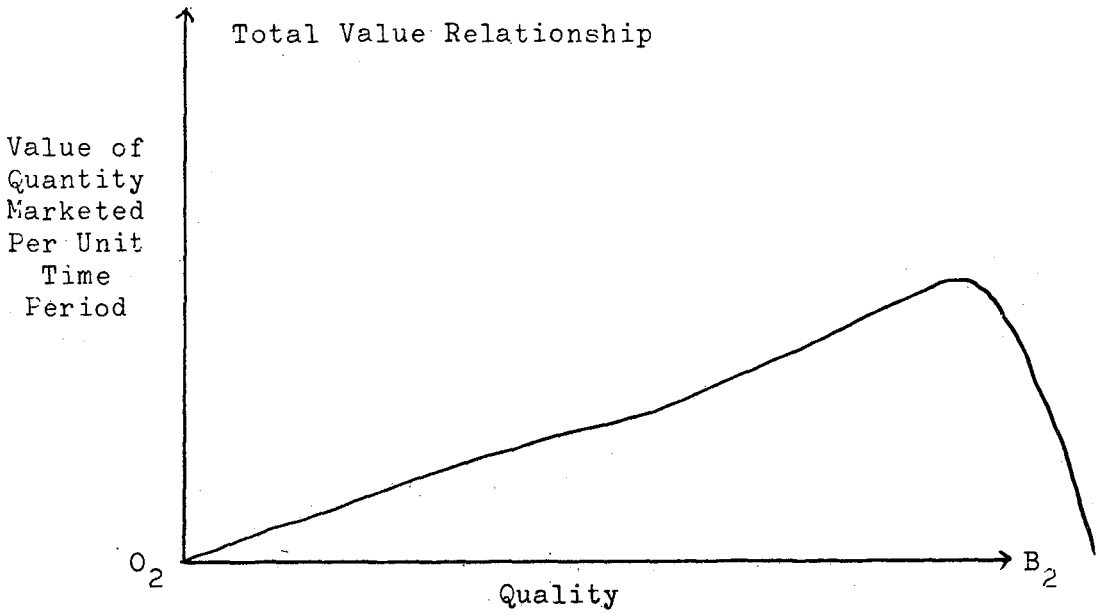
---

* This result was obtained by taking the daily price data from three growers who market on the same auction floors. While the three growers do not pack similar sized fruit into similarly named grades, similar sized grades existed. The prices for these grades were recorded each day that the three growers fruit were sold on a particular market.

The mean and standard deviation of each grower's prices were found and the hypothesis that there is no significant differences between the population mean prices of the three growers was tested using students t. The hypothesis was able to be rejected at the 10% (P = 0.10) level.

This now allows a value curve to be postulated Graph 3.3.

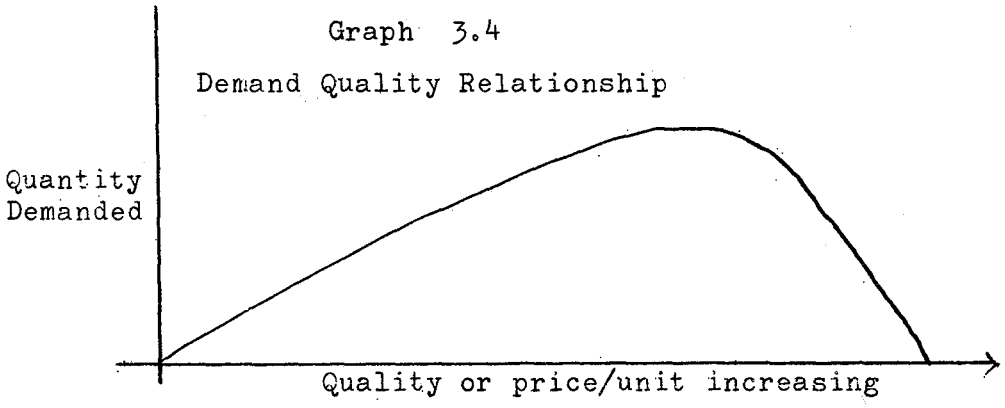
Graph 3.3



Note that this graph is skewed even further to the right than O_1B_1 on Graph 3.1.

R.R.W. Folley [4] on page 144 of his paper considers that a relationship of the following type also exists.

Graph 3.4



This type of relationship must vary with the average price of the market on the day, for if the market were glutted compared with a period of scarcity then prices will be much lower for all qualities in the glut period.

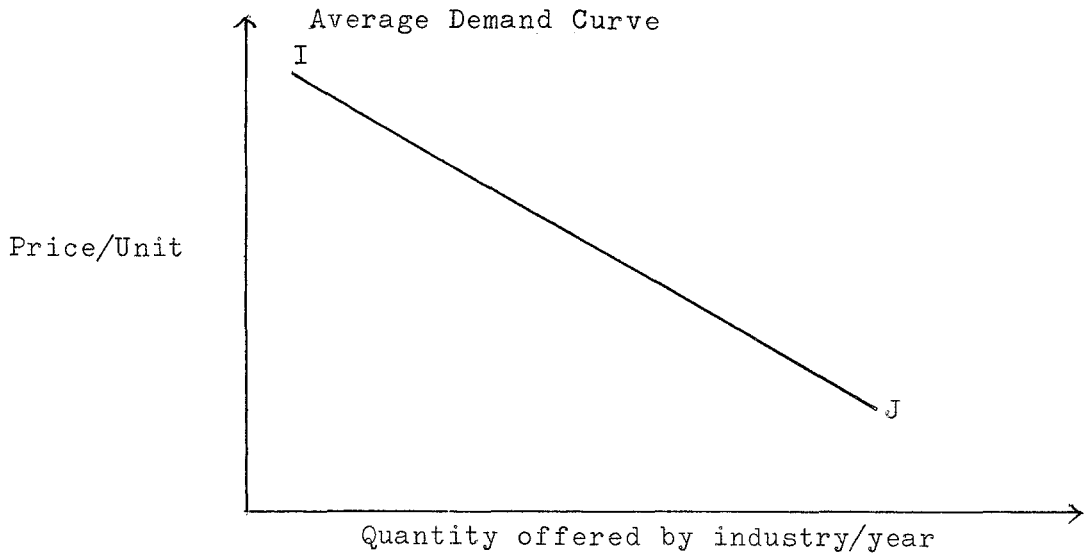
Demand is defined as the quantity of the product which will be bought at a certain price.

Folley's relationship can be accepted with the condition that the market price is constant.

3.2.1b Annual Demand and Generic Produce

The apricot has a demand curve. For the annual case the curve is of the shape shown in Graph 3.5 (assumed for this exercise).

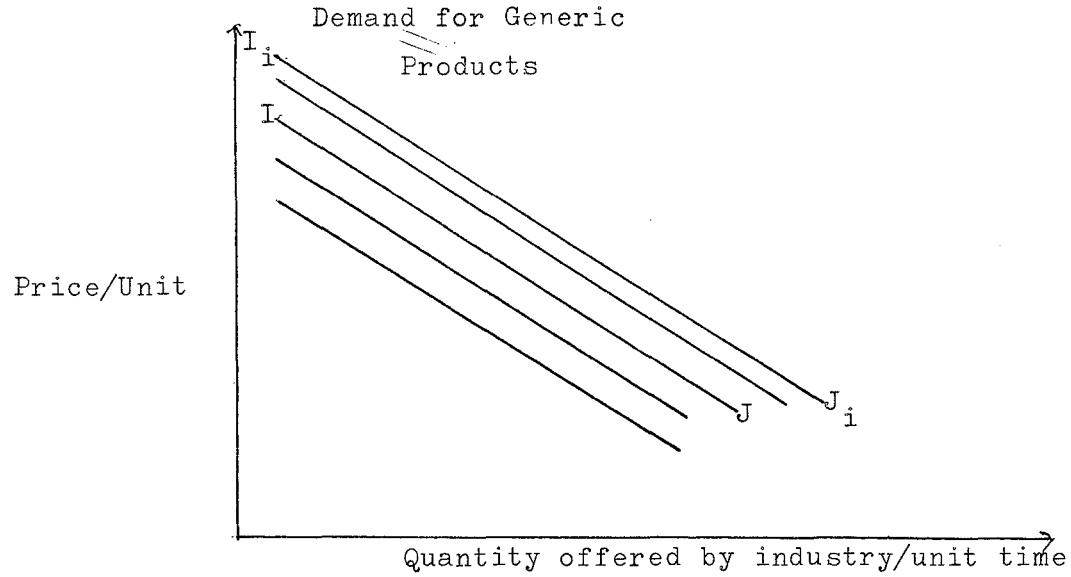
Graph 3.5



The line IJ representing the average market price for the whole crop over the year.

Considering that the product is generic we should draw the relationship as in Graph 3.6.

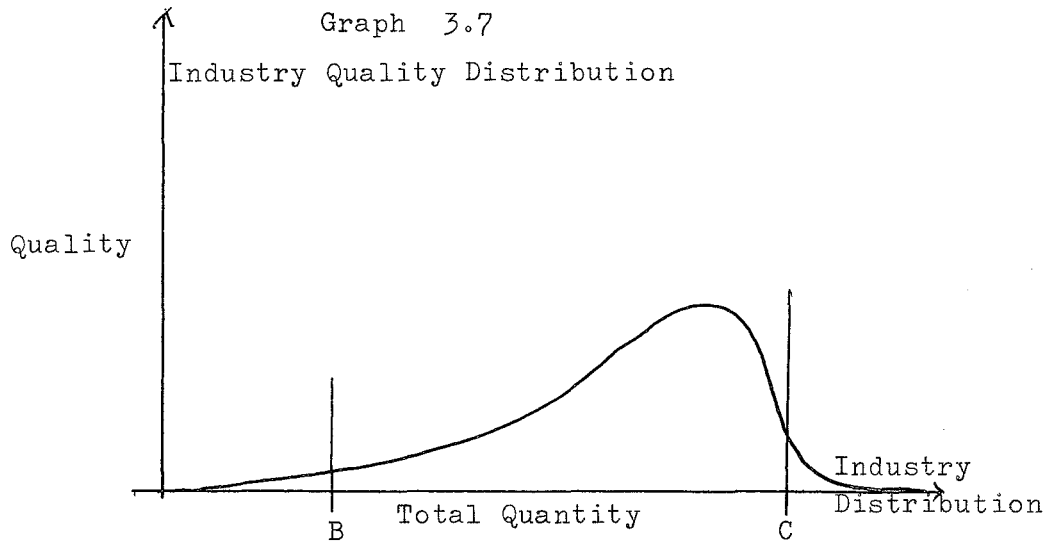
Graph 3.6



Where IJ is the mean of the very large number of I_iJ_i.

When a grower markets over a year he does not sell all the products in the generic range he may perhaps sell between the boundaries BC on Graph 3.7.

Graph 3.7



The mean of the distribution BC will differ from the industries mean and as a result the demand curve which he faces will not be IJ in Graph 3.6 but one of the many I_iJ_i.

Therefore every grower who does not market the full range of the generic product faces a different price quantity relationship

to his neighbour. There are therefore, two sources of variation from IJ. Quality as such and range of product quality offered.

3.2.1c Production Planning

As fresh stone fruit are perishable time does not concern this argument. It is clear that production planning must consider both quantity and quality. It is obvious that growers already do this. They have moved to areas where high quality can be obtained through climate and they thin and irrigate to obtain bigger sized fruit. (One of the major components in quality.)

3.2.2 The Firm; Supply Characteristics

The individual is free to market his stone fruit in almost any manner which he chooses. He must choose whether he is going to market an homogenous product or a graded product and the degree of grading which he will implement.

The individual may market his stone fruit on any market he pleases.

3.2.2a Processor Supply

A large number of growers supply the factories with stone fruit. Some growers regularly supply all the acceptable fruit which they produce.

Others supply the markets until they consider that the factory pays more. At this point they must make a decision - how much fruit should be diverted. If all the growers were able to suddenly withdraw all their fruit from market and supply the processors then the market price would rise drastically.

Economic theory would suggest that each grower should market that quantity of fruit on each market which equates marginal revenues.

But, basically the grower of stone fruit has no control over what his marginal revenue will be on the auction market.

The daily price of stone fruit is likely to be largely a function of quantity supplied that day. While an individual grower can slightly affect his own price the major effect comes from the rest of the industry.

With the information available today, the grower has no means of rationally deciding which markets to supply and how much fruit to send to the factory.

3.2.2b Very Short Run Market Supply

Supply by the grower is fixed after despatch. No more fruit can be sent, none diverted. After expiry of the travel lag the markets of New Zealand receive a fixed supply of fruit. They normally sell all this fruit on the day and therefore normally do not adjust supply on any one day. The very short run is defined for stone fruit as the period from farm gate to auction.

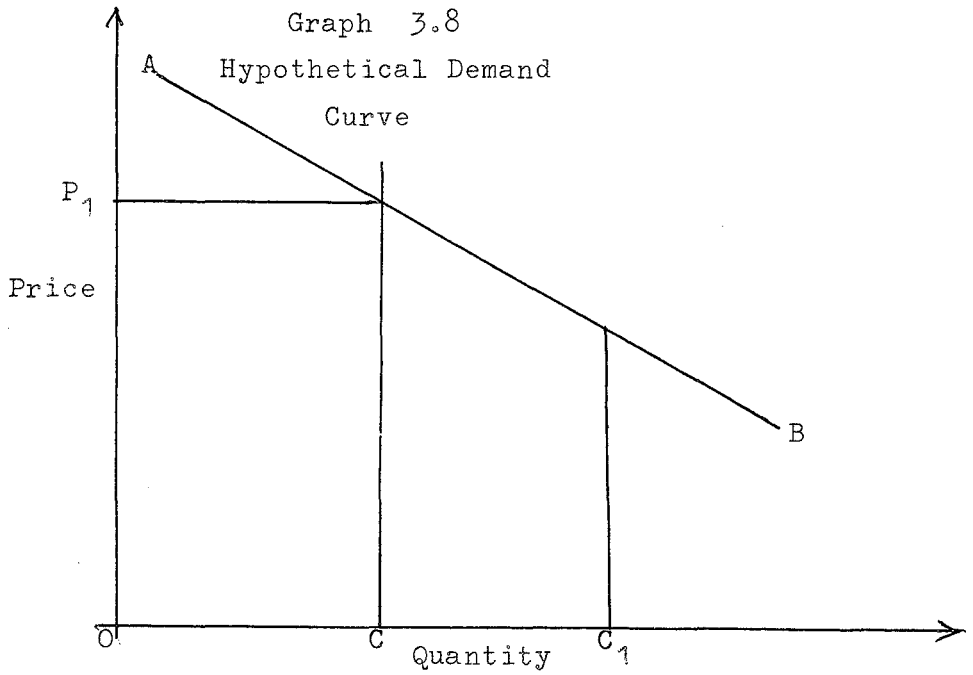
3.2.2c Short Run Market Supply

Defining the short run as any period greater than the very short run, but less than a period in which the grower can increase the scale of his operation, supply becomes infinitely variable to the extent that the grower is physically able to market. He can market his daily pack which must be picked. He may also have fruit in cool store.

A grower can send any or all of his stock to any market, collection of markets or the processors. It is this ability of all the growers collectively to vary their supplies which leads to market supply instability.

Consider the hypothetical demand curve AB in Graph 3.8.

Graph 3.8



On day one, the quantity supplied is OC and the price P1. If P1 is significantly greater than all the other prices then three basic decisions can be taken by a grower.

(1) To send more fruit as the price is higher.

(2) To send less fruit as everybody else will be sending more.

(3) To send the same amount as the grower always patronises this market.

The most likely case is, that after the travel lag has expired, supply may increase to OC_1 but no-one can predict where C_1 is likely to be.

The rationality of each decision will be studied in chapter VI.

3.2.2d The Long Run

In the long run the grower may increase the scale of his production.

From the time of planting the average apricot grower needs five years before his trees produce a significant increase in his total apricot production (not ascribable to the effects of season). The trees will require at least ten years to reach full production. The economic life of a tree is conservatively estimated at forty-fifty years for apricots in Central Otago. Peach trees in Hawkes Bay may not be worth keeping after 15 years.

The orchardist who wishes to increase his scale of production must do so with very little data. There is generally a considerable waiting period between the ordering of trees and their receipt from the usual source of supply (N.Z. Fruitgrowers Federation Nursery). Some growers now have their trees propagated privately. Consider one of these growers. At the time he plants he does not know how many other trees are planted. Horticultural Statistics produced by Biometrics Section are available for past years planting figures.

Any rational decision to plant an apricot block will require considerable study. The price in any year is a function of the quantity marketed. The quantity marketed is influenced by the total crop (influenced by the weather) and the proportion sent to the factory. Also the crop potential in any year is the result of a function of the following type.

$$Y = (a_1X_1 + a_2X_2 + a_3X_3 + a_4X_4 + a_5X_5)$$

where,

Y = total crop potential (bushels) for New Zealand

a_1 = the bushels potential per acre of trees in their $5 + 1$th year

X_1 = the acres of trees in their $5 + 1$th year.

Such complexly lagged long term production could easily produce a cycle similar to the American Pig Cycle although of much longer duration.

3.3 COSTS AND RETURNS

Economic theory suggests that for a firm to produce at the point of maximum profit it should produce to the point where Marginal Cost = Marginal Return.

It has already been pointed out that a grower has no means of predicting his daily marginal revenue unless he sends all his fruit to the processors (where the price is constant and dependent on the quality of the growers product).

3.3.1 Costs

Any attempt to obtain a meaningful marginal cost of production for any one property is at the moment irrelevant. Irrelevant because the marginal cost of producing an extra bushel per acre of apricots is virtually a meaningless concept. The orchardist cannot close his plant temporarily, he cannot immediately increase his crop potential over what the elements will

allow him because of the lag between planting and fruition.

The marginal cost of improving quality is a much more meaningful concept but as to date quality has not been measured. This will not be studied further.

The marginal cost - from a long run point of view - is also a problem to estimate. Fraught with the problems of lumpy inputs, economics of scale and diseconomies of scale and lags.

CONCLUSION

The arrangements for stone fruit marketing have been described in a manner which allows the application of normal demand supply concepts.

The discussion of generic products allows some of the homogeniety problems to be overcome by considering "line" prices. A "line" is the common grower consignment to market and consists of a mixture of all the grades he produces for the particular stone fruit variety.

CHAPTER IV

ANNUAL MARKETING

The objective in studying stone fruit marketing on an annual basis is to predict future prices under varying conditions and to provide a basis for considering the effects of changes in the market structure.

4.1 DATA COLLECTION

4.1.1 Price Data

Wholesale price data at auction were collected from a panel of ten growers who market throughout New Zealand. The records were kept by growers as market diaries, account sales or in their varietal records.

The average price for the panel was obtained and this annual price was then assumed to be the industry price. This assumption could be a source of error but no way to check this was available. Total value figures not being available.

4.1.2 Quantity Data

New Zealand Department of Agriculture statistics were used to obtain the quantity data. These statistics are available to the public. These data are collected annually by survey using field officers of the Horticultural Division, Department of Agriculture.

The statistics are called New Zealand Department of Agriculture Horticulture statistics.

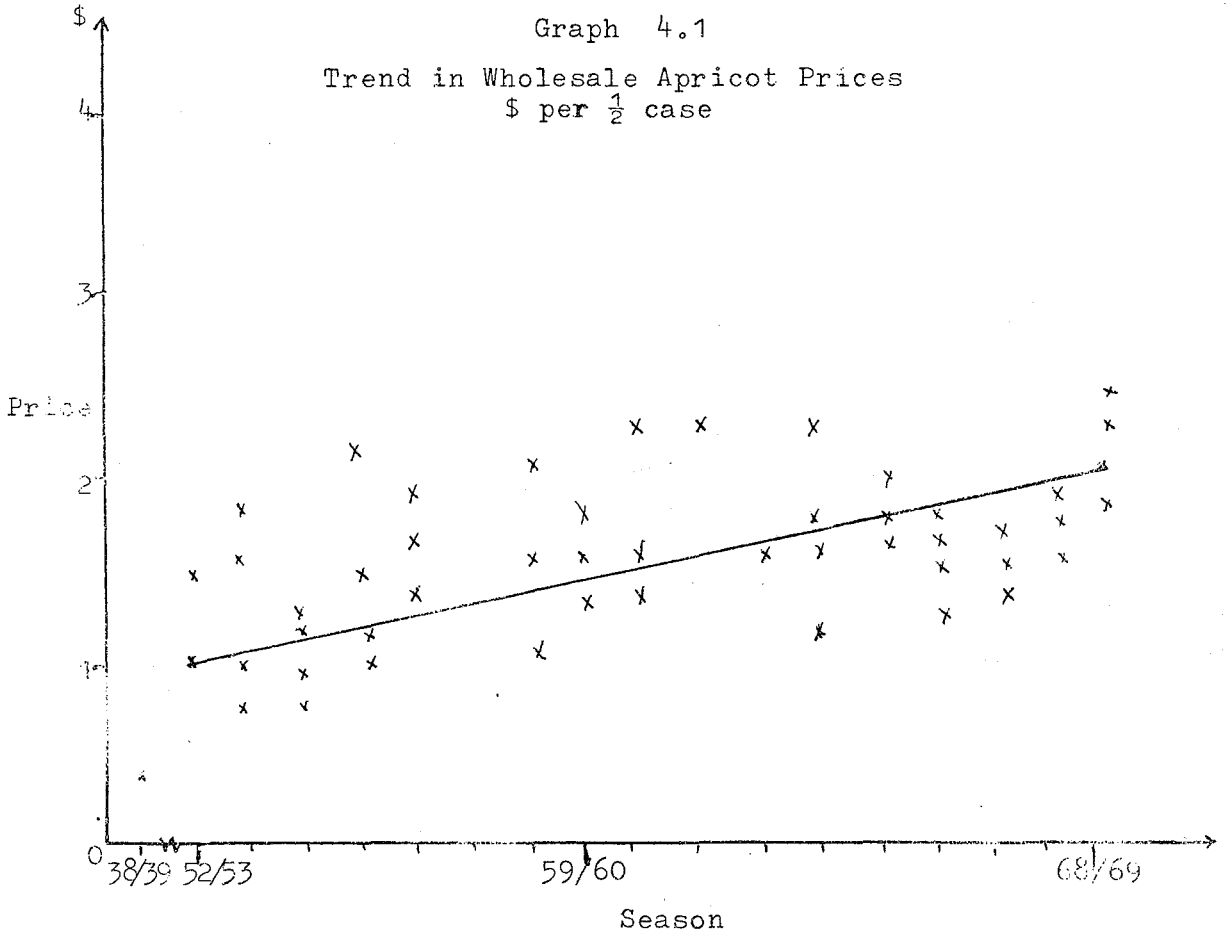
4.2 PRICES AND TIME

In this section a general indication of the movement of apricot prices over time was sought. The fruit growing industry often claims that price movements for their product are not keeping up with inflation.

Graph 4.1 shows gross wholesale prices received by the panel for apricots. The several points for each year are the individual variety averages.

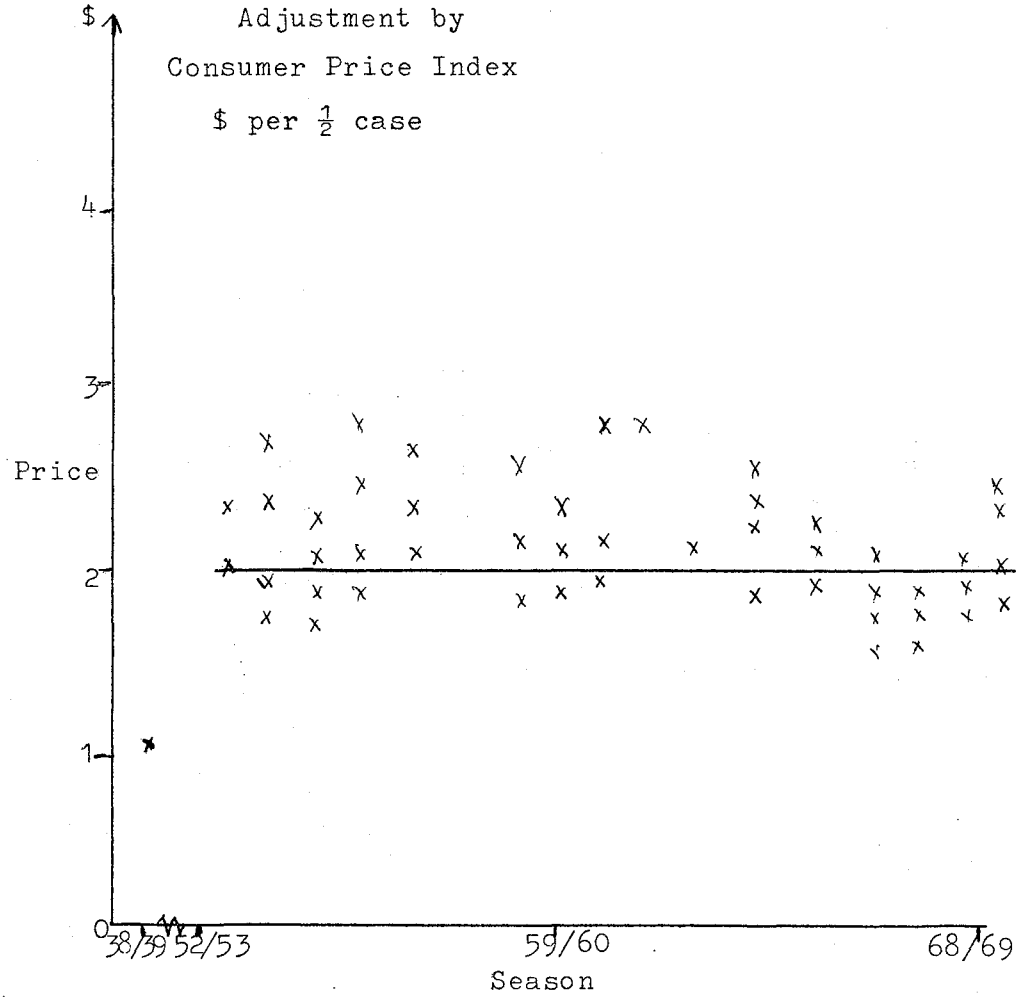
Graph 4.1

Trend in Wholesale Apricot Prices
$ per ½ case



Graph 4.2

Wholesale Price Trend for Apricots After Adjustment by Consumer Price Index



Graph 4.2 presents the same points after deflation by the Consumer Price Index, base year 1968/69. The consumer price index was chosen as the author felt this to be the best method of expressing the buying power of past prices. As the apricot is a very small part of the value of consumer goods this assumption appears reasonable.

Graph 4.2 indicates that in the past there has been virtually no long term movement in the buying power of the apricot

crop.

4.3 PRICE QUANTITY RELATIONSHIP

Thompsen and Foote [6] define demand as,

> "The quantity of a product or service which buyers will take at a given price in a given market at a given time."

Demand for stone fruit at the wholesale level is not simple consumer demand. The bulk of the fruit is bought by a buyer on behalf of a retailer. (Chapter VIII.) However, the objective was at this point, not to measure demand characteristics but to establish a method whereby the price in any year could be predicted.

4.3.1 Prediction

Numerous growers had informed the author it was their opinion that the annual average apricot price was a result of the quantity marketed in that year. Note, that if this is so then the price is a result of the quantity marketed and demand over time.

It was deciced to test this grower opinion. A graph of the form -

$$Y = \alpha + \beta X$$

was used where Y = price in cents per bushel, for bare fruit at farm gate, and X is the quantity marketed on the domestic market in New Zealand. That is, all apricots not sent to the processors are included in X. X therefore equals the total New Zealand apricot crop minus the quantity sold to processors.

The resulting graph is -

$Y = 1210 - 0.0048X$ (equation 1)

$r = 0.88$

$F = 72.54$ with $(1,10)$ degrees of freedom. For these degrees of freedom F 0.01 = 10.04. The data decisively rejects the hypothesis of no relation between the variables.

The 95 per cent confidence interval for B is $.0048 \pm .0012$ using t and the 95 per cent confidence interval for Y at X = 140,000 is 535 ± 56.

The Durbin-Watson statistic is 2.15. The Durbin-Watson tables do not extend as low as eleven observations.

This relationship is described by prices from twelve consecutive years up to 1965/66. The four points from the years 1966/67 to 1969/70 do not fit closely to the line.

$Y = 1210 - 0.0048\ X$

These points have been displaced above their expected values by an apparently constant change. The effect of this displacement was included by using a dummy variable.

The relationship (equation 2) was obtained,

$Y = 1070 - .0043\ X_2 + 141\ X_3$ (equation 2)

where,

Y = price/bushel in cents

X_2 = the quantity marketed on the domestic market in New Zealand in bushels

X_3 = a shift variable with a value of one in the years 1965/66 to 1969/70 and a value of nil elsewhere

F = 412.0 highly significant at 1 per cent level

R^2 = 0.85

95% confidence interval for β_2 = $-.0043 \pm .0011$

95% confidence interval for β_3 = 141 ± 62

Marketing factors which could have contributed to this demand shift,

(a) improved control of brown rot.

(b) improved transport communications.

(c) advertising.

It could be contended that improved brown rot control in marketed fruit would increase buyer and public faith in apricots. Improved transport facilities enable more markets to be reached with little handling and transhipping.

Acquaintance ("Buy apricots now") type advertising was introduced in its present form at the beginning of this period also. It is the author's opinion that advertising was a major contributor to the price rise.

It would appear that some or all of the factors improving fruit quality and consumer knowledge leads to possible higher prices.

In work such as this it is difficult to separate the individual effects of technical change and quality improvement.

If it is accepted that this demand shift is real and not likely to shift for some time, then we can use equation 2 for predictive purposes and obtain our best estimate of predicted price.

In the 1970/71 season, frost destroyed most of the crop. The total apricot production for New Zealand was predicted to be approximately 30,000 bushels. Predictions are made by the Horticulture Division prior to crop maturity. The expected gross average wholesale price for all apricots sold was predicted at 570 cents/half case using equation 2 and assuming a minimal amount is sent to the processors. At the time of writing, reports from markets indicate that this figure may be very close to the true national average.

The conclusion can be made - that the annual average wholesale price of apricots is largely predictable in terms of quantity only.

4.3.2 Other Considerations

The fact that the price of a commodity can be predicted in terms of quantity only over time is rather surprising.

The relationship neglects the important effects of,

(a) competing products prices.

(b) consumer income.

(c) consumer tastes and preferences.

(d) the number of consumers using apricots.

A time series study of competing stone fruit products prices was made. The records of five growers were found to be suitable in that they sold a range of stone fruits for several years. The nectarine and peach data were considered and analysed in the same manner as apricot prices to obtain a national figure for the fruit for each year. The correlation coefficients were,

S apricots/peaches + .46

S apricots/nectarines + .44

S nectarines/peaches + .61

We can therefore conclude that there is sympathetic movement between these product prices. The major reason for this relationship is possibly the fact that inter-year crop variation is largely a function of the weather. In a good year all stone fruit crops in the country are likely to be heavy and vice versa.

4.4 INCOME EFFECTS

The effect of consumer income tastes and numbers of consumers cannot be neglected when considering the future prices of stone fruit.

The price trend over time is virtually hortizontal. This means that ovef the period under consideration the average quantity marketed and the quantity demanded has been matched. Although this has occurred in the past, it will not necessarily occur in the future.

An estimate of the income elasticity of demand is required.

Several attempts were made to establish this parameter using time series data. No result giving a coefficient for Y significantly different from zero was achieved.

No attempt was made to estimate the effect of Y using cross section data.

The effect of income is important. This may be illustrated by considering that if the income elasticity of demand is, for example, 2.0, then projected market quantities for the next five

years could be sold at constant prices.

4.5 FUTURE PRICES

Future stone fruit prices, at a given income elasticity, will largely depend upon technology, trees planted and removed and processor policy.

These important aspects of marketing were studied in an attempt to guage their affect upon stone fruit prices.

Apricots are again used as an example.

4.5.1 Technology

Table 4.2 shows that the three year average crop/acre from bearing trees has increased considerably over the last ten years.

Table 4.3

Apricot Production

Year	3 yr Moving Average of Crop (Bushels)	Average Acreage	Average crop/acre of bearing trees (Bushels)
1960/1961	193,000	823	244
1962	209,000	834	251
1963	215,000	831	266
1964	227,000	839	276
1965	246,000	899	295
1966	254,000	948	306
1967	273,000	967	326
1968	275,000	1,038	330
1969	270,000	1,068	301
1969/1970	288,000	1,165	304

Discussions with advisers and growers reveal all considered, that as new techniques are continually being introduced the crop per acre will continue to increase, at least as fast as it has in the past. Linear regression of the above cropping trend gave the following relationship.

$Y = 253 + 8.3\ X$

X = Year

Y = Expected crop per acre

$r^2 = .72$

F = 20.9 which is significant ($F_{.01} = 11.23$)

The 95% confidence interval for β is 8.3 ± 4.1

Using this we can expect an apricot crop of 378 bushels per bearing acre in the 1974/75 season. It is not proposed to discuss whether this increase is technical change or due to increased inputs.

4.5.2 Future Projections

The supply of apricots in 1975 is virtually fixed. No trees planted now will substantially alter the crop in 1975. Unless trees are removed there will be 1165 acres of producing (five year plus) apricot orchards in 1975.

The expected national apricot crop in 1975 will therefore be 378 x 1165 = 440,000 bushels. This is almost 100,000 bushels greater than the heaviest crop to date. Frost and other climatic factors may influence the crop. A crop of this size handled in the manner that the 1969/70 crop was, would lead to prices considerably lower than in that year. As the effects of income

and population have not been measured this statement must be viewed with considerable caution.

With the exception of a possible hydroelectric scheme in the Clutha Valley, no factors have been detected as likely to cause long term reductions in stone fruit crops. Apricot crops can be expected (using the evidence above) to increase substantially in the near future.

Data on processor requirements is also required. It is likely that in the near future, canned Australian stone fruit will be available in New Zealand as a result of the New Zealand-Australia Free Trade Agreement. Processor policy in this event was not available at the time of writing.

From the admittedly fragmentary evidence in this chapter it appears that problems in the future maintenance of price can be expected for the apricot crop.

CHAPTER V

DAILY PRICES FOR STONE FRUIT

This section of the study was undertaken on the Christchurch Market. The Christchurch Market consists of four firms all of whom sell stone fruit by auction.

5.1 DATA COLLECTION

Price data were obtained from growers records only. The panel of growers (which included some Canterbury producers) had sufficient consignments on the Christchurch market for virtually every consecutive marketing day from Christmas until the middle of February to be studied.

Quantity data were obtained from the auction firms in Christchurch. Quantity data only was obtained from the wholesalers. These data were only available for two years as earlier records were incomplete. The quantities were the total quantities of apricots in half case equivalents offered for sale each day on the auction floors in Christchurch.

5.2 DAILY MARKETING CHARACTERISTICS

5.2.1 Supply

In chapter III reference is made to the fact that supply

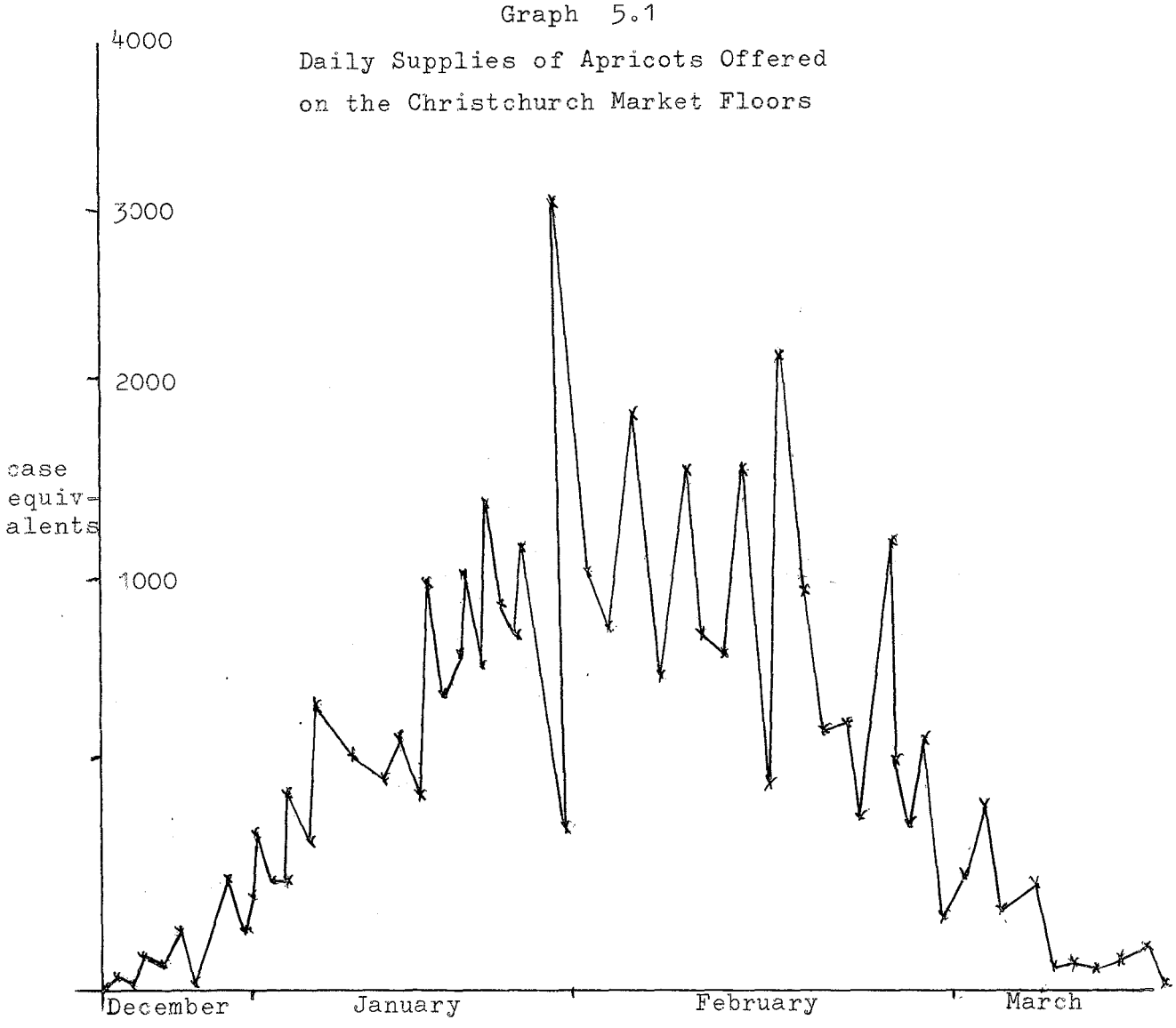
in the short run is almost infinitely variable. Graph 5.1 shows that the Christchurch market is subject to enormous, almost chaotic fluctuations in supply. If each days supply was not sold each day, then fruit would be carried over to the next day and if supply were not almost infinitely variable, then the tremendous between-day fluctuations would not occur.

Graph 5.1 plots the daily offerings in the 1968/69 season. A study of the 1969/70 data reveals the same pattern.

For both years, daily offerings are heaviest on Mondays and Thursdays.

Graph 5.1

Daily Supplies of Apricots Offered on the Christchurch Market Floors



Several attempts were made to predict price on a daily basis.

5.2.2 Daily Price/Quantity Relationship

If price formation for stone fruit can be understood, then the industry can adjust its policy to make the best of the market.

5.2.3 Price formation for Apricots

If we assume that the price on a marketing day is largely a result of the past and present supplies and the level of demand, then the price is largely beyond the control of individual buyers provided each of them is relatively small.

Let us assume that the price is largely beyond the buyer's control. There are four auctions in Christchurch, each being conducted at approximately the same time.

Now if actual supply and demand conditions are fully known to all buyers and wholesalers and if the judgement of individual buyer's and seller's in translating these conditions into bids and offers were the same, then under perfect competition the price existing on the market at any one time would be the "true" supply and demand price. No seller would accept less. No buyer would pay more.

But this does not occur for such information on supply and demand is very imperfect in the case of stone fruit, competition is not perfect and as a result market prices will fluctuate back and forth around the "true" supply and demand price.

This process of fluctuation about the true price is called price discovery. It occurs constantly as it is the experimentation

necessarily involved in determining the supply and demand conditions and the prices that are justified. It is possible therefore, for a skilled buyer to purchase to his advantage by influencing sellers to think that the price should be lower. This occurs and is demonstrated by Kitson [1], who shows through analysis of grower price records that some buying firms in some towns are able to use the imperfections of the system to consistently obtain a better price for their supplies.

The opposite to both these effects also occurs.

Now if we accept that the imperfections of the system will balance out, and is the "true" price (weighted average market price) exists and deviations from this true price are a result of imperfections, given demand is constant. We therefore arrive at the conclusion that <u>if demand is constant</u> then price changes will be a result of changes in the quantity sold.

Daily demand may not be constant, theory and grower opinion points to daily demand being influenced by the weather, proximity to Christmas and many other factors.

A cursory study of buyer habits revealed that there is a period during which the retailers inventory can be depleted and purchases do not have to be made.

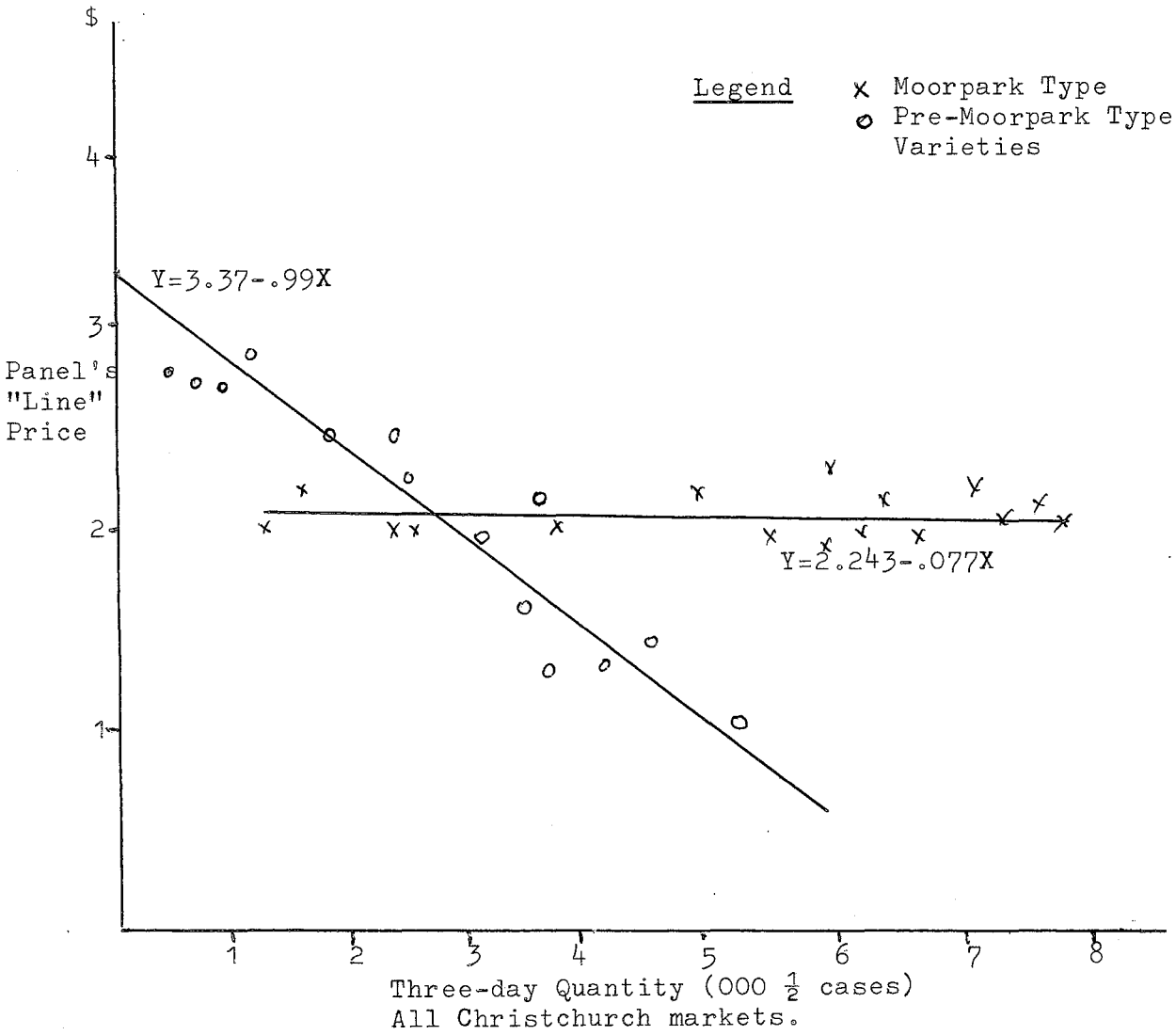
This leads to the concept of a buyers purchasing horizon. If a retailer wishes to stock apricots of quality he must buy within the purchasing horizon or not stock quality fruit.

This horizon was found to be three days by a telephone survey of 35 Christchurch retailers. Daily price is therefore considered to be a function of the quantity supplied on that day,

plus the two proceeding market days. Once again the daily price is the mean price of the panels lines of apricots.

Graph 5.2

Relationship Between Price of Apricots and Three-Day Supply



Graph 5.2. There are two daily price quantity relationships, as there are two different consumer products.

The line $Y = 3.37 - .99\ X$ (Y = average "line" price in dollars)

$r^2 = .92$ (.19) (X = 3 day quantity in thousands of half case equivalents)

(The Durbin-Watson test was inconclusive)

describes the relationship found between price and quantity for pre-Moorpark* varieties in 1968/69.

Similarly $Y = 2.243 - 0.077\ X$ describes the Moorpark varieties relationship in 1968/69. (.012)

The 1969/70 "Moorpark" relationship was,

$Y = 2.41 - .087\ X$ (.006)

The Durbin-Watson test indicated no autocorrelation using F.

Both these relationships were highly significant. In addition an F test was applied to establish whether the relationships are significantly different.

Using Chow's test described in Johnson [8] p.137, it was found the hypothesis $\beta_1 = \beta_2$ could not be rejected.

Unfortunately further data could not be obtained to test the extremely small between-year variation shown in the Moorpark relationship. This data being destroyed for earlier years.

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* Pre-Moorpark varieties are the early varieties generally with a dessert appeal only. The major varieties are; Newcastle, Oullins Early.

Moorpark varieties are those later varieties usually with a dessert and culinary use. Major varieties in this group are Moorpark, Trevatt, Dundonald, Roxburgh Red.

The pre-Moorpark period in the 1969/70 season was extremely interesting, the prices opened as expected at about $3.00 per case and higher. Very soon afterwards brown rot was blamed for a substantial drop in price (brown rot also reduces the buying horizon). The local growers retaliated with heavy advertising to increase their gate sales. The weather became very hot and heavy supplies of fruit were again offered for auction. The price crashed, the auction firms advertised the glut and the public arrived to buy. The price rose.

The result was an interesting price pattern. The application of the three day quantity principle to this period did not produce a statistically satisfactory relationship. There appeared to be no price quantity relationship over time in this period in 1969/70.

A knowledge of the quantities sold through these outlets would allow for more precise price prediction. Grower gate sales records were not sufficiently accurate to contribute to the analysis.

5.3 PRICE FLUCTUATION

It has been demonstrated that daily price fluctuation is due largely to quantity fluctuations of apricots supplied to the market (market in this case meaning the whole of the buying power which the Christchurch central markets predominately satisfy in the stone fruit field).

Secondary fluctuation occurs through imperfect knowledge on the part of buyers and sellers.

5.3.1 Reducing Instability of Daily Price

The reduction of instability at auction lies in increasing grower co-operation. A marketing authority, its function, scope, objectives and likely results is an extremely complex and interesting concept. A thorough consideration of such an organisation is a major undertaking and was not considered further.

A simple system which could work required a daily, integrated, continuously reviewed system of price prediction. Such a system is practical for if such prices were freely available, growers would not oversupply any market.

The critics of this system consider that such a system would automatically fail as the first non-perfect competition supplier would discredit the predictions.

The mechanics of the system are described by the following example.

On any consigning day a grower will ring up and ask for the prices in the five markets. He receives these prices which will be approximately equal and makes his decision. His consignments are noted and the predicted prices on the markets used immediately reviewed.

No grower is likely to place fruit on a low return market.

No grower would expect to obtain exactly the predicted price. He would expect with time, to consider himself likely to be above or below the predicted price. They would understand that daily fluctuations about this price would occur as a result of the functioning of the price discovery mechanism.

Problems of fruit being late for the sale and like matters

would still be the growers responsibility.

A bureau to perform the above function would depend for its success upon having the majority of the growers participating and that all have to do exactly as their decision indicated.

CHAPTER VI

GROWER MARKETING STRATEGIES

This chapter describes the use of a simulation model in describing the efficacy of various marketing strategies, for the attainment of maximum return at farm gate.

6.1 RETURN FOR MARKETING SKILL

A grower does not always receive the average industry price for his fruit on each day for his crop. If a grower's product quality is better than the average, then his expected price will be greater than average.

But a grower whose expected market price is better than the industries mean will not necessarily obtain the expected advantage. His skill as a marketer influences the payout which he will receive. As a result of his extremely flexible supply ability, the orchardist is able to use marketing expertise to obtain a premium for his fruit.

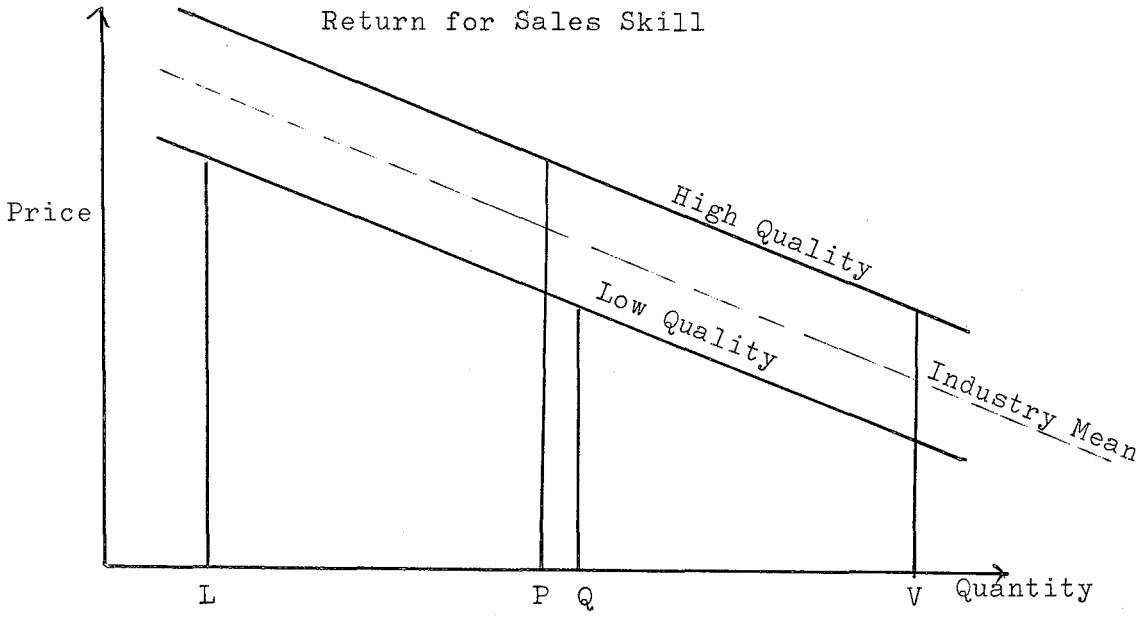
In an extreme case he could realise a higher price than his competitors higher quality produce. (See Graph 6.1)

If a grower only supplies on days when quantity was in the LQ range and his competitor on days when supply was in the range PV, then the grower is clearly getting a return for his marketing ability.

Growers know that the good marketer can obtain this advantage

and many use complicated strategies. These strategies are classified below.

Graph 6.1



6.2 THE STRATEGIES

Four major strategies are explored individually and in combination.

"Market" in this chapter is defined as all the auction floors in one town. The descriptions and opinions used to define the strategies result from the author's experience.

The positive chasing strategy is defined as the strategy whereby a grower sends small lines of fruit to several markets (to act as market intelligence) and sends the majority of his fruit to the market upon which he got the best price on the last marketing day. This information is supplied by telegram.

If all persons followed this strategy then a classic "cobweb" fluctuation in price would result.

The negative chasing strategy is the exact opposite of the positive chasing strategy. The grower who uses this strategy considers that a cycle of the cobweb type does exist. He therefore sends his fruit to the lowest priced market, assuming that higher prices will exist there when the time lag expires.

A spreading strategy is employed by some growers. These growers spread their consignment over as many markets as possible without reducing their daily pack to an unmanageably small series of lines. They consider that this method will give an average return with least risk.

A "buddy" strategy is employed by some who consider that by continually patronising one market their product will become better known, and they will be known better to the auctioneer as a "good customer". The users of this method consider that they should therefore get a better price under all conditions.

A few random sellers can give no method by which they determine where to send their fruit. If their selling is truly random, and they supply often enough, then their result should be similar to the "spreading" sellers.

6.3 THE MODEL

The objective was to build a model capable of comparing the five strategies for their efficiency, efficiency being measured in terms of net farm gate price for the grower's total crop.

The model (a copy of the basic program is included as Appendix III) is a large loop. The model reads the total crop size to be

sold and the maximum and minimum daily packouts are established. This establishes the individual consignment sizes.

The consignments are then sold according to the strategy selected. A random number generator established the daily packout distribution. A feature of RANDU, the generator used, is that with the same starting number, the same series of random numbers is generated. In this way the same packout distribution was used for each strategy.

6.3.1 Data

Data were collected during the initial survey described in chapter II. All growers were well established and known to buyer and auctioneer.

The prices used initially were the gross price paid less commission. The conversion to farm gate price was carried out by the model, using the charges required to transport a case of fruit from the farm gate to the auction floor.

All the strategies were explored using gross market price and farm gate price as the basis for consigning to markets. The panel of growers whose prices were used, supplied account sales or marketing diaries from which each grower's price daily on each market could be calculated.

Sufficient 1966/67 data were available to allow the selection of nine markets; Invercargill, Gore, Dunedin, Timaru, Christchurch, Wellington, Palmerston North, Hamilton and Auckland. Forty marketing days (eight weeks) were considered. A matrix of 40 rows and 9 columns (360 observations) was then created using the weighted

average of all growers supplies to a market on a marketing day. Nineteen observations could not be obtained. The prices for these observations were calculated using other prices, such as peaches. This action can be justified by the fact that there is significant correlation between the daily price fluctuations of stone fruits. If apricots are dearer on a certain day then it is likely that peaches will be too. The cause of this correlation is probably that especially in southern markets, the bulk of the fruit is consigned from one region. If a market falls from favour it will receive less of all stone fruit.

After initial data assembly the matrix was re-organised to allow the programme to correctly adjust for the travel lag.

6.4 RESULTS

The program yielded the absolute maximum and minimum prices for the 1966/67 season.

If, each day, the average panel grower had been able to sell that day's consignment on the market which returned the highest gross price that day, then his average gross price for the season would have fluctuated between 301 and 308 cents depending upon consignment size. This maximum has a farm gate value of 218-225 cents.

The absolute minimum price calculated by the same method was 128-132 cents/case depending upon consignment size.

The absolute maximum assessed by selling using the highest farm gate price was 241-248 cents at farm gate.

Table 6.1 shows the results. All results are expressed as mean farm gate prices per case received for a season's fruit of approximately 10,000 cases. These results are a mean of ten runs using different sized lines. The maximum range of the mean is ± 5 cents.

Table 6.3

Results from Simulation Model

No. of markets patronised each day	Tactic or Strategy: Positive Chasing — Using Farm Gate Price	Positive Chasing — Using Gross Price	Negative Chasing — Using Farm Gate Price	Negative Chasing — Using Gross Price	Spreading	Random
	$	$	$	$		
1	2.15	1.85	1.52	1.61		
2	1.99	1.85	1.47	1.49		
3	1.91	1.87	1.48	1.50	Fluctuating	Violent
4	1.84	1.80	1.46	1.49	about the	Fluctua-
5	1.73	1.73	1.50	1.51	mean of	tions
6	1.74	1.74	1.52	1.56	1.59	about the
7	1.67	1.67	1.52	1.55		mean of
8	1.61	1.60	1.50	1.52		1.59
9	1.60	1.60	1.59	1.58		

If the spreading tactic is used on many markets there is some fluctuation in final price, but the smaller the number of markets that fruit is sold on the bigger the price differences found.

The random tactic has the same effect.

The "buddy" system, when a few markets only are patronised, gives a price of 150-185 cents depending upon the market chosen. We cannot measure whether the grower is likely to get a return for "loyalty". But it is likely that if such prices exist the payment is for the trustworthiness of the grower brand. Such payments are in the panel data used as the panel included a range of growers who are already known to auctioneer and buyer.

"Spreading", "random", and "buddy" tactics, if applied blindly and at random will yield an average return of 159 cents, but this mean can vary considerably.

Positive chasing using the farm gate price as the chasing criteria has the highest overall result. This is closely followed by positively chasing gross prices.

Negative chasing tactics are definitely inferior to positive chasing tactics.

The model also produced evidence to show that markets geographically closer to the source of supply were comparatively over supplied, these markets seldom yielding a high farm gate price compared with the rest of New Zealand.

6.5 Conclusion

It has been shown in an earlier chapter that violent fluctuations in quantity of apricots supplied to a particular market occur.

This chapter has shown that in the year considered, chasing the market was the most efficient sales tactic as it produced

more money for the grower.

But, any increase in this tactic could quickly negate these findings.

If all growers employed this tactic then large price fluctuations resulting from cyclic supply fluctuations could occur.

CHAPTER VII

AUCTION SELLING

This chapter considers the efficiency of stone fruit sales at auction.

A positive increase in efficiency is considered as an increase in net return to the grower.

7.1 THE GROWER AT AUCTION

Auction selling by some growers is carried out very efficiently. Growers adjust their consignment sizes to minimise freight costs. Growers also do not supply too large a line at any one auction floor. Evidence from grower records shows that too large a consignment can force the growers own price down below where it would have been had he supplied a smaller line.

Growers make use of the premium available for quality and earliness.

Skillful judging of the market gives the skillful marketer an advantage over his competitors.

With the exception of Direct Selling the evidence suggests that growers can obtain the highest net farm gate return from this method of sale - provided they can sell their fruit to a processor if their expected price falls lower than $2.10 per bushel of bare fruit.

Many growers do this and as such are using the system efficiently.

Also, from the growers point of view, the system itself is an efficient method of selling a fresh market crop of stone fruit. Other methods of sale are likely to yield a lower net return. Direct Selling is again the possible exception.

7.2 THE INDUSTRY AT AUCTION

The Industry as a whole could act as a monopolist.

Smith [12] pg. 8, documented the quantity of fruit to achieve optimal fresh marketing as 104,000 bushels. This analysis used the equation $Y = 1210 - .0048\ X$ and does not contain the shift variable.

Considerable advantages were available to the industry if they followed this course of action.

A similar analysis using the improved relationship shows that in future years the maximum quantity which should be sold fresh is (using $Y = 1070 - .0043\ X_2 + 141\ X_3$) approximately 117,000 bushels. At this point marginal revenue is \$2.10 per bushel of bare fruit at the farm gate.

The remainder of production should be processed, to achieve greatest industry profits.

This result is not compatible with the individual grower's objective for at this quantity the grower will be receiving \$7.00 per bushel and it would therefore pay the individual grower to continue his selling at auction.

7.3 ATTEMPTING TO ATTAIN THIS GOAL

If processors require apricots and are prepared to pay $2.10 per bushel average for it then a collective monopolistic selling system will succeed in the short run.

If suitable sites are available then new entrants will tend to move into the industry. After an initial lag they will begin producing fruit and reduce the proportion of fruit which the individual could sell on the fresh market.

Some production increase could be expected after seven years, so the monopoly could succeed for at least this time.

If the processors were unable to buy more fruit then dumping fruit would initially bolster grower revenue. Once again however, new entries to the industry would be attracted, when producing they would obtain a share of the market and all producers returns would drop.

To sum up. Any attempt which artificially reduces supplies to the auction market will initially raise price.

Any method which does raise price will attract new entries to the industry reducing all incomes after the expiry of the time lag.

7.4 AUCTION EFFICIENCY

To all persons who sell at auction the question of whether or not the grower receives what he ought to is a much discussed subject. The problem is further complicated by the fact that the econometric measures used earlier in this work all reflect the

position as it has been, complete with imperfections.

If the system were improved, buyers could only buy easier. It is unlikely that commission rates would fall (several firms have been taken over in the last few years and negotiations for more mergers and take-overs are proceeding) and buyers are unlikely to bid higher because the sale is quicker and they need less time to buy per day. Nor are buyers likely to reduce their fees.

The results therefore, of making the actual sale more efficient are unlikely to be passed on to the grower.

7.4.1 Auction Firms

The sale of fruit at auction in New Zealand does not conform to the perfect model of economic theory. Some of the major reasons for this are:

(1) There are a restricted number of auction firms in the industry

(2) The entry of new firms into the business is severely restricted [1] p.21.

Auction firms are members of a virtually closed oligopoly. To date all buyers have been virtually forced to trade through this oligopoly. Oranges and bananas are distributed by a monopoly (Fruit Distributors) through this oligopoly. Imported oranges etc. are allocated on a quota basis. The size of a buyer's quota depends on how many dollars he spends at the auction market. So, if retailers obtain supplies elsewhere they don't get imported oranges and bananas. There are some documented exceptions to this statement

7.4.2 Retailers and Auction

The auction system involves double handling and time delays out of controlled climate store.

The spacious auction floors are costly to construct and trucks lie idle while the crop is sold.

Mr T. Ah Chee, Foodtown, Auckland has demonstrated that travelling time, buyer time and product quality are all resources which the system handles poorly (address to Lincoln College Fruit-growers Short Course, 1970).

Table 7.1 shows buyers and retailers have come together via ring buying, commission buying or agent buying. Group buying speeds up auction and reduces the retailer cost. Group buying appears to be on the increase.

Table 7.1

Analysis of Buying Power Trends

in Christchurch

Year	No Floor Buyers	No. Bought For	Group Buying	Buying Power	
				% Single Business Buyers	% Chain & Group Buyers
1958	331	349	8 for 79	77%	23%
1963	290	394	12 for 104	69%	31%
1968	154	668	22 for 528	44%	56%
1970	133	568	22 for 455	42%	58%

Note : Genuine supermarket buying power is assessed at 21% of the total (January 1971).

If the small businessman were not able to buy his fruit through an agent buyer he would earn less profits. It is not economical for a shop keeper to spend the majority of each morning purchasing his day's stock.

If all buyers were forced to attend the sale the auction would take longer and therefore the commission raised. Already over-crowded facilities would have to be extended to handle the same amount of fruit as today.

7.5 THE GROWER

The auction system from the growers point of view is very efficient. He is able to obtain the benefits mentioned in 7.1, he can trade on this market with no fear of bad debts, can virtually always sell his crop at some price.

CHAPTER VIII

"DIRECT" SELLING

Direct selling is the most controversial subject in fruit and vegetable politics today.

The sale of fruit directly from the grower to retailer, (direct selling) must not be confused with direct delivery. Direct delivery involves sale by sample or by agent or auctioneer with the bulk of a line being supplied directly to retailer.

This chapter shows several situations where direct sales are not a problem. It concludes with two situations in which direct sales are a problem to the present system.

8.1 PREVIOUS WORK

Kitson [1] p.76-83, p.290-297, discusses this problem at length. He states that the advantages may be any combination of:

(1) Savings in marketing costs.

(2) Product improvement, freshness, quality, suitability and standardisation of grade.

(3) The product may be available to the public cheaper than through conventional channels.

Kitson then moves on to discuss the implications of direct selling and bargaining strengths of retail and producer groups.

Kitson says in summary (p.81) ..."Although economic theory

> suggests that as buyer power becomes more concentrated into the hands of large retail organisations, and the opportunity for exercising this power, in a way which will provide growers with a smaller share of the gain from trading will become ~~greater~~, there is little valid evidence to support this contention..."

Two growers in the Alexandra area were chosen. Each grower produced fruit of similar quality and marketed the fruit at the same time of the year. Kitson was able to show that the direct seller sold at an advantage to the auction seller.

Kitson was unable to show how the direct seller would compare with the auction seller when selling in Auckland at auction.

Secondly, he was not able to show whether the direct buyer would buy the auction sellers fruit at the same price as the direct sellers.

Kitson was unable to prove or disprove the contention that direct buyers selling prices determine maximum selling prices at auction.

The direct seller Kitson studied, has a 21 cent advantage over the auction seller considered, (per half case).

Kitson moves on to consider that the main criteria for a change in marketing pattern was met - reduced cost. The grower criteria is also present to lure him away from auction - higher returns?

Kitson also notes that the effect upon the auction system should also be studied as lower utilisation is likely to be associated with higher costs.

8.2 EFFECTS AT AUCTION

From this study direct selling has not greatly affected either auction price or efficiency up to the end of the 1971 season.

The two questions are:

(1) Is direct selling harmful to growers as a whole?

(2) Will the public receive any benefits as a result of direct sales?

Kitson has stated that an answer to question two cannot be provided. It is not proposed to consider this problem again as a study of future retailer efficiency is beyond the scope of this work.

8.2.1 Direct Sales Effects on Auction Price

In chapter V a daily price/quantity relationship was shown to exist.

Now let us assume that this relationship is that which prevailed in 1969/70.

$Y = 2.41 - .087 X$

Y = Price in dollars/half case.

X = Three day quantity of apricots supplies (thousands).

Let us now assume the following supply pattern exists to the auction floor.

Day	1	2	3	4	5	6	7	8	9	10
Supply Daily	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
3 day Pattern	1000	2000	3000	3000	3000	3000	3000	3000	3000	3000

It is obvious that after day three, the expected auction price is approximately $2.15 (actual $2.149).

Now assume that an isolated consignment of apricots arrived in Christchurch of say, 1000 cases, and this arrives on day 4. The market supply pattern is now changed and our expected price pattern would (if all fruit were sold at auction) be:

Day	3	4	5	6	7	8	9	10
$	2.15	2.06	2.06	2.06	2.15	2.15	2.15	2.15

So even if the whole of this crop were sold at auction significant expected price reductions would occur.

If perfect knowledge existed in the price formation process this would be the sum effect of direct selling.

Price formation for apricots (and other stone fruits) is far from perfect. The more likely pattern is one of two.

Position 1

No one knows the extra fruit has arrived except the persons involved.

Position 2

The persons involved have advertised and all buyers know the consignment is present.

Note

In both cases the consignment size of the extra auction fruit is not known.

Let us consider a marketing day. Before this day no fruit has been sold direct in the area.

A price/quantity relationship

$$Y_E = \alpha + \beta X_E \qquad (1)$$

is known to exist. Where Y_E is the price at which buyers and sellers would normally expect to exist when quantity X_E is offered for sale.

Let us now assume that another quantity X_D of fruit is delivered direct to shops without the auction systems knowledge.

This action will remove bids from auction creating a new relationship.

$$Y_N = \alpha + \beta_1 X_D + \beta_1 X_E \qquad (2)$$

or

$$Y_N = \alpha + \beta_1 (X_D + X_E)$$

Where Y_N is the price at which all fruit offered for sale would be sold on a market supplied direct and through auction. When the amount sold direct is small and X is large we can assume that $\beta = \beta_1$.

Using this assumption it should be noted that the sum effect is the same as if X_E had been increased by X_D on the auction floors.

The processes of price discovery may take some time to find the new point Y_N but eventually they will.

In position 1 (above), theory suggests that the price will be initially established at Y_E which is too low and successively tend towards Y_N.

In position 2 the processes of price discovery should take less time to cause the price change from Y_E to Y_N.

In both these examples, provided no interference occurs, the price will be little different to that prevailing - if the same quantity had been sold through the market floors.

8.2.2 Direct Sales and Interference

Let us now consider the position of a retailer who buys his fruit direct. Assume that a buyer normally buys A% of the auction throughput. The retailer buys direct (from growers who receive premiums) and advertise the product at X% below what he would have had to pay for his supplies at auction. Let us further assume (as most commonly happens) that the ordinary suppliers to this market are not aware of the direct sales and they consign the usual sized consignments. (Using Graph 8.1)

Let the usual price paid be P_1 and the usual quantity sent be Q_1 then $P_1 = \alpha + \beta Q_1$ for each day.

When direct sales start the first day, expected price P_2 is as if all were sold at auction -

$$P_2 = \alpha + \beta Q_1 (1.0 + A)$$

and the second day's expected price is -

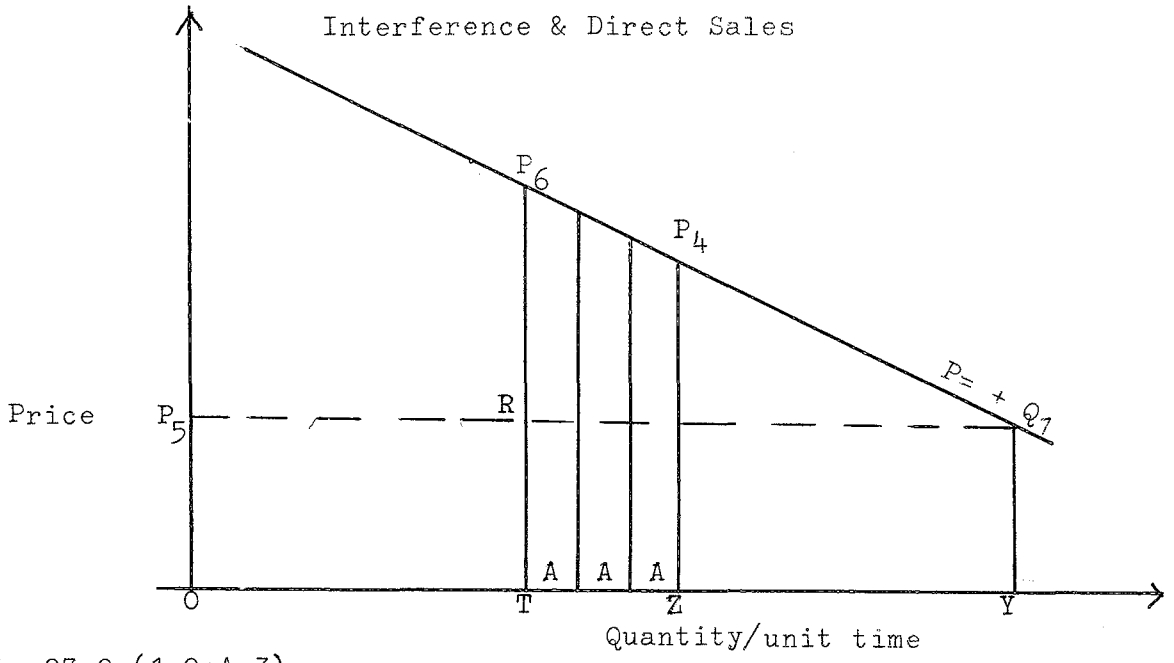
$$P_3 = \alpha + \beta Q_1 (1.0 + Ax2)$$

and the price should settle without interference at -

$$P_4 = \alpha + \beta Q_1 (1.0 + Ax3)$$

Now assume that this retailer promotes his product at a price less than P_4, say P_5.

Graph 8.1



$OZ=Q_1(1.0+Ax3)$

If the retailer sells at P_5 then auction price must rise above P_5.

If the retailer is able to sell at P_5 for more than a few days (and provided he doesn't increase the quantity he sells) there will be an unsatisfied demand for fruit. The consumer wants to buy OY at P_5. The retailer is only able to supply A% each day. The rest of the fruit will be sold at an increased price to ration it.

At price P_5 the consumer wants to buy OY per three days. The consumer receives Ax3 of OZ leaving OT to be sold. Normally a price P_6 would prevail, but having a lack of Ax3 bids, the price quantity relationships will be shifted downwards. Normally the line $P = \alpha + \beta Q_1$ would shift to pass through point R. Provided A is small. Basic theory however, points to the fact that since Ax3 cases of fruit have been sold at a price less than their true value, more purchasing power than usual is available to buy the

remaining quantity. The greater the discrepancy between P_4 and P_5 the closer will the auction price be to P_6. The less real bids having been removed from the market.

8.2.3 Large Buyers and Sellers

All the evidence so far supports the contention that direct sales are not a problem.

Kitson [1] p.81, mentions large buyers and was quoted earlier in this chapter. The problem of large sellers is considerable. A case history from the mushroom industry provides an excellent example.

In the winter of 1970 the average wholesale price for mushrooms gross on Christchurch was 69 cents/lb for a particular producer.

The average price for 1970 was 53 cents/lb gross for the same producer.

Late in 1970 a new firm joined the producers. The firm employed an Agent to sell their product direct to retailers and consumers (restaurants etc.). The price is set and retailers are prevailed upon to sell for less than 50c/lb.

The original growers, who produce a cleaner and higher quality product are unable to secure a premium at auction.

This large concern has effectively, by direct selling, secured a greater share of the market.

The monetary result is that other growers who may be more efficient are unable to obtain as high a return as they would under full auction because they are selling upon a distressed

market. Price quantity data suggests that the average price should be about 35 cents wholesale. The new firm should be getting less than this.

The auction market is currently (February 1971) selling approximately the same quantity of mushrooms as in 1970. Direct sellers are selling more than the auctions previously did, to the same buyers. The buyers are satisfied and do not go to auction to augment their supplies.

There are two propositions which can explain this.

(1) The new entry is exerting powers which tend towards monopoly. The movement toward monopoly will increase as the competing growers in Canterbury become financially embarrassed and fail.

(2) The buyers see so many benefits from buying direct that they are not even interested in auction.

A retailer gets these benefits through buying direct.

(i) Fresh Product. In the case of any fresh product this is most important.

(ii) Constant Price. Allowing advertising, budgeting and better forward planning.

(iii) Constant Quality. The buyer from the retailer gets to know the product.

(iv) Specials. Requests for large quantities for specials can be made at a realistic price.

When supplies are available advertising can be confidently placed in advance. The retailer can be confident that his supplies

will not run out and be forced to discontinue the special because the auction price has risen.

In summary, the new firm is able to obtain a higher price than they would at auction. The local growers are suffering as a result of this influence. There is a possibility that this is a result of the incurring of short run losses to exercise monopoly type power, but it is also likely that this price improvement is a result of the better service offered to retailers.

8.2.4 Direct Sales of Large Quantities

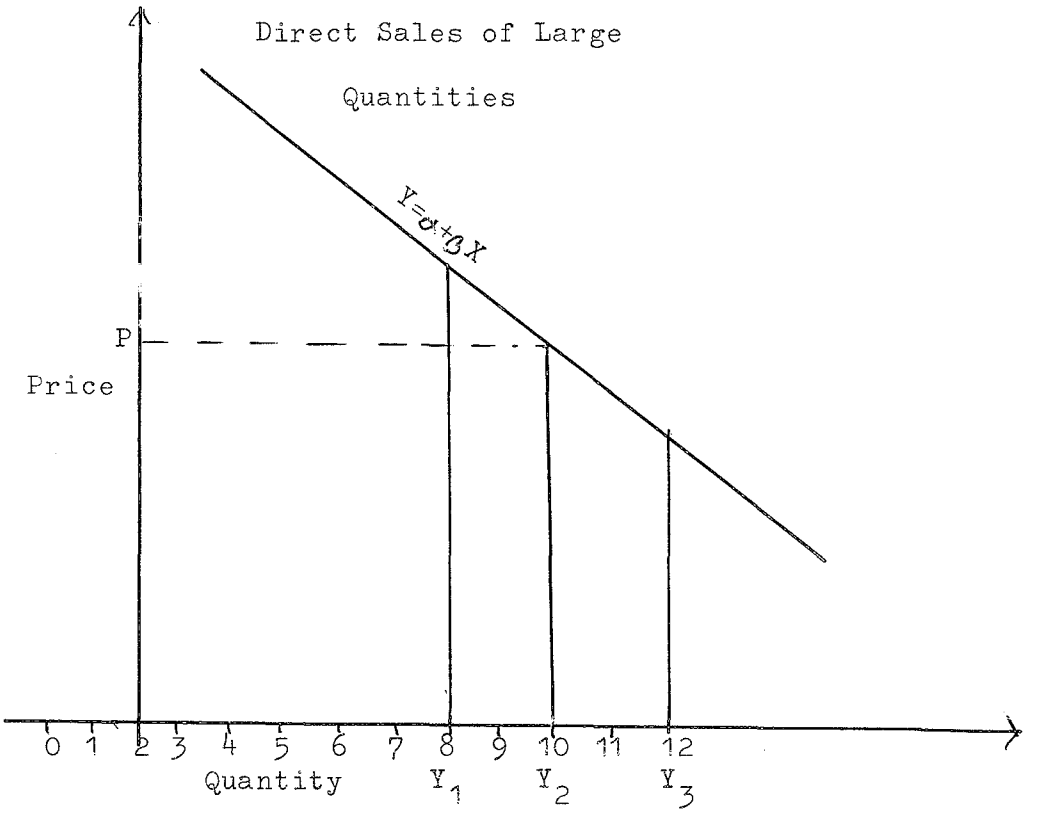
Sections 8.2.2 and 8.2.1 considered direct sales effects when the quantity sold direct is a relatively small proportion of the market.

When a large proportion of the market obtains supplies direct the problems increase.

If a group of growers co-operated and sold through an agent they could effectively act as in section 8.2.3 and secure a premium for their fruit. To the financial disadvantage of the rest of the marketers of stone fruit.

If a large proportion of the market obtains its fruit direct from a host of small suppliers, the auction price would cease to be a basis for price negotiation. Graph 8.2 illustrates this point.

Graph 8.2



$Y = \alpha + \beta X$ is the curve which would exist if all the crop were sold at auction.

OY_1, is the quantity which is bought in each three day period direct by retailers.

$Y_1 - Y_2$ is the amount which is supplied in one three-day period.

Therefore, if all the crop were sold at auction the "true" wholesale price is P.

Let each increment in 8.2 be q units. Therefore at price P 2q units are sold at auction.

Now let the auction quantity supplied increase by 2q to increase total supplies to $Y_3 = 12q$.

The direct buyers quantity will not change but the auction buyers will face twice the quantity on their market while total

quantity has increased by only 2q to a total of 12q.

Let us know consider the Christchurch auction market.

In 1969/70 $Y = \alpha + \beta X$

$Y = 2.41 - 0.087 X$

The median 3 day quantity supplied to this market was approximately 8000 cases.

Assume that a constant direct sale to Christchurch of 6000 cases occurs. The expected price would be $1.71 for the 8000 cases supplied. If the total quantity were to suddenly increase to 16,000 cases the price will drop to $1.01.

In the case where each type of buyer served a completely immobile buying public an increase of supplies to auction would make this the position that a buyer would face, and the auction price would drop to $1.01. This being the maximum effect in a less than completely immobile situation.

That is, in this assumed case an increase in supplies of 25% could cause a drop in price of 70 cents while if all were sold at auction the price change would have been 17 cents.

This type of effect is not likely to occur for any period of time. But, it is likely to occur every time quantities vary significantly on the market. This discussion contrained by severe assumptions describes the potential effect.

Price increases will also be violent. But, at the point when the buyer considers that he cannot match the other proportion of the market he will discontinue bidding. Under these conditions direct sales will effectively place a ceiling price upon the market.

(Almost no one would buy similar apricots, peaches, plums to the direct buyers at double the direct price especially when the direct sellers are readily accessible.)

8.3 IMPROVING THE WHOLESALE SYSTEM

Preceding chapters have demonstrated that the wholesale disposal system as it exists is satisfactory from the growers point of view.

If increased efficiency is considered to be an improvement in grower returns, then under the present system this is largely over to the industry as a whole.

The auction firms too have improved the relative per unit costs of marketing for the grower by holding their commission rates to 10 per cent for many years. This has been done by the more efficient handling of the fruit. The actual sale has been speeded up by introducing improved auction facilities.

From the grower's point of view he is unlikely to receive an increase in efficiency (greater net grower return) at auction.

Modifications to the present sales system were considered such as grower co-operative selling, and central sales in the producing area.

Neither of these methods is likely to increase grower return over the return from the present system.

It has also been shown that an overall improvement in efficiency is not likely through direct selling.

One structural change which could improve efficiency is

direct delivery. This method of sale is one where a broker arranges a sale and the fruit is delivered direct from orchard to buyer.

This method should be more efficient as the fruit is handled less and arrives at the point of sale more quickly than at present. The buying horizon should increase, reducing price fluctuations and fruit could be forwarded in a more forward condition giving improved flavour of consumer appeal. Such a sales method (which was implemented in a small way in Christchurch in the 1969/70 season) should theoretically benefit all suppliers. This may not, however, be the case.

Small growers with small lines of fruit may suffer because of the relatively higher per unit cost to dispose of their crop compared with large lines.

The essence of such a system is that by selling through a central brokerage system the forces of supply, demand and the resulting price discovery mechanism could continue to work efficiently. Such a system contains many of the retailer desirable components specified previously.

In a system where all sales are conducted directly between producer and retailer the "true" price of any line would be very hard to estimate. Little of the information on quantity - so readily available today - would be obtainable.

8.3.1 Conclusion

This study was an attempt to measure the forces operating within the stone fruit market of New Zealand.

From chapter II we have an understanding of the forces which cause a grower to supply the outlets used. Using this information and economic theory we have measured some of the factors influencing annual price. It must be noted that much more work is required in this field, particularly to study the effect of national consumer income upon the industry. This chapter also demonstrated that through co-operation, higher returns could be obtained by the industry.

In chapter V it was demonstrated that the daily price of apricots is largely predictable in terms of quantity and this led on to a consideration of marketing strategies. These strategies were documented for one year but more work is required to establish the effects of changing total strategy by the industry.

A detailed consideration of several direct sales cases was made showing that only in certain cases need direct sales be detrimental to grower interests.

Finally a short summary is made of possible modifications to the present system; only one of which is considered to be likely to have benefits for growers.

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The individual fruit growers who so freely supplied initial information were very helpful. The panel who supplied special data deserving special mention. It was through these growers

alone that satisfactory price data were available.

Finally I would like to record my appreciation of the time effort and understanding displayed by my wife Alison in providing a home environment suitable for the production of this thesis.

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APPENDIX I

QUESTIONNAIRE SURVEY OF APRICOT GROWERS' MARKETING PRACTICES

GROWER: _____

1. What area of bearing apricots do you grow? _____acres

2. Interviewer's opinion of orchard: (a) excellent
   (b) good
   (c) fair
   (d) poor

3. In what ways do you sell apricots?
   (a) Auction floor
   (b) Process
   (c) Gate
   (d) Mail Order
   (e) Direct sale to retail trade
   (f) Others

4(a) What proportion of your crop do you sell in these ways?

(a)	(d)
(b)	(e)
(c)	(f)

4(b) What is the total quantity of apricots produced and sold last season.

Produced _____bu.

Sold _____bu.

5. Auction floor: (a) In your opinion what advantages has the system got?

1, 2, 3, 4, 5, 6, 7, 8, 9, 10,

(b) Disadvantages?

1, 2, 3, 4, 5, 6, 7, 8, 9, 10,

6. Process: (a) In your opinion what advantages has this method of sale got?

1, 2, 3, 4, 5, 6, 7, 8, 9, 10,

(b) Disadvantages?

1, 2, 3, 4, 5, 6, 7, 8, 9, 10,

7. Gate: (a) What are the advantages of gate sales?

1, 2, 3, 4, 5, 6, 7, 8, 9, 10,

(b) Disadvantages?

1, 2, 3, 4, 5, 6, 7, 8, 9, 10,

8. Mail Order: (a) What are the advantages of mail order sales?

1, 2, 3, 4, 5, 6, 7, 8, 9, 10,

(b) Disadvantages?

1, 2, 3, 4, 5, 6, 7, 8, 9, 10,

9. Direct sale: (Retail) (a) What are the advantages of direct sales to retailers?

1, 2, 3, 4, 5, 6, 7, 8, 9, 10,

(b) Disadvantages?

1, 2, 3, 4, 5, 6, 7, 8, 9, 10,

10. Other: Comments.

11. Which sales method do you like the most?

12. What is the biggest problem which you face when marketing your stone fruit?

13. Do you market your other stone fruit in the same way as apricots?

1, 2, 3, 4, 5, 6, 7, 8, 9, 10,

14. What marketing records do you keep? Would you be prepared to allow us the use of these records for future, more advanced studies?

APPENDIX II

SURVEY OF SOUTH ISLAND STONE FRUIT GROWERS MARKETING PRACTISES (JANUARY 1969)

1. Introduction

The objective of this survey was to establish:

(a) The proportions of fruit marketed through the alternative channels available,

(b) Growers' experiences with different marketing systems and their views as to advantages and disadvantages.

2. The Sample

Apricot growers were interviewed in the Clutha Valley and surrounds between Millers Flat and Lowburn. All areas between these points were surveyed and a total of 169 growers were contacted. These growers market from 772 acres which is approximately 94 per cent of the apricot growing area in Central Otago and almost 80 per cent of the dominion total, at the time of survey.

Grower response to the questionnaire was excellent, all growers who were contacted giving information. See Appendix I for copy of questionnaire.

3. Results

The results are expressed as a percentage of the total fruit sold from three areas. These are then combined in appropriate

proportions to yield the percentage of Central Otago apricots sold through each channel.

District	Survey and Acres	% Fruit Sold by Each Method: Auction	Process	Off Farm	Mail	Direct to Retail	Others & Export
Cromwell	67	95.8	0.2	1.1	1.2	1.7	-
Alexandra	424	83.4	12.2	2.1	0.6	1.4	0.3
Roxburgh	281	32.0	65.1	1.4	0.7	0.6	0.2
TOTAL	772	65.8	30.2	1.7	0.6	1.5	0.2

District boundaries were established geographically. The Cromwell district included all northern areas surrounding Cromwell, (Ripponvale, Lowburn, and Bannockburn). Alexandra included the Cromwell Gorge, Clyde, Earnscleugh, Conroys Gully, the Manuherikia and all points north of Fruitlands. The Roxburgh area included all points south of Fruitlands in the valley to Millers Flat.

The objectives as in Section (b) were obtained from questions five to twelve inclusive.

4. The Auction System

In the Cromwell district 75% of the growers considered that the auction system yielded a better net on farm fruit price, than other methods of sale. Alexandra growers who felt the same way comprised 81 per cent of the sample while in the Roxburgh area only 22 per cent of the growers had this experience.

The major reasons given for this statement were that the growers obtained a premium for top quality fruit, a premium for earliness, and a premium for good presentation of their product

at auction.

In the Cromwell district, 45 per cent of the growers listed as an advantage of the auction system, the point that the whole of the growers crop can be sold in a short space of time. Approximately half of these growers mentioned the advantage that under auction, they can pick heavier, thus reducing costs of picking. The more mature fruit is sent to nearby markets and the less mature fruit further afield. (No comment was made about packing labour.) These sentiments were not mentioned to any great extent in the other areas, only 11 per cent of the Alexandra growers mentioned this advantage. None of the Roxburgh growers felt this way.

Other advantages of the auction system which were mentioned by some of the growers were:

(a) that the auction system can quit the whole apricot crop in a short space of time.

(b) that a grower's freedom to choose who auctions his fruit is preserved.

(c) that the system guarantees payment promptly and that bad debts don't occur.

(d) that a grower enjoys attempting to assess the prices and obtain the maximum returns from the auction floors. This was an advantage listed by 5 per cent of the growers while the majority registered this as a major disadvantage of the system.

4.1 Disadvantages of the Auction System

Over 85 per cent of the Cromwell region listed price

fluctuations as a major disadvantage of the auction system. In the Alexandra area 56 per cent of the growers considered this worthy of mention. In the Roxburgh region 38 per cent mentioned price variation as a defect of the system.

The price variation mentioned was general price fluctuation, within a line on one market, between markets in the same town, and country wide.

Concern was also registered that this fluctuation, while being partially due to buying pressure (or the lack of it), is self perpetuating as a high price on one market almost invariably leads to glut conditions a few days later, and vice versa (when the travel lag has expired).

Other growers attributed the fluctuations to fluctuations in demand only. Many of the marketing growers claimed that the immediate post-Christmas glut is due to reduced public buying power, possibly caused by heavy commitments over this period.

Another factor which growers feel is important is the weather. Many growers claimed that in a normal season when hot weather occurred in the South Island, then apricots would be expected to drop in price, while if hot weather occurred in the Auckland region, prices there would rise and vice versa. They justified this with the point of view that in the South Island the apricot is cheaper, considered less of a luxury and the bulk of demand is used for preserving while in the Auckland region it is a luxury.

The magnitude of the price fluctuation problem is reflected by the fact that 57 per cent of all the growers who market by the

auction system listed as their biggest problem, the lack of information with which they have to make the day-by-day decision - "where should I market by fruit and in what quantities?". No other group of answers can be selected from question twelve. The other replies to this question were randomly distributed across the whole range of problems listed in this report.

In the Cromwell region 35 per cent of the growers claimed that their distance from markets involving high transport costs, considerable time lags (affecting quality) and poor handling (causing damage in transit) was a disadvantage of the auction system when compared with sales methods where freight is paid, or fruit is bought at the orchard gate.

Better packaging, better packs improved transport speed, less transhipping with more efficient palletisation and bulk handling were all suggested as improvements which would help reduce current fruit quality deterioration. Alexandra growers also felt that this was a problem with 33 per cent of the growers meriting it. However, in the Roxburgh region only 7 per cent felt this way.

In the Roxburgh region over 50 per cent of the growers felt that the auction price was too low and only 32 per cent of the area's crop is marketed by auction. Roxburgh could therefore, be considered as processor orientated while the other regions are more auction orientated. The sharply contrasting primary sales methods are reflected in the advantages and disadvantages which each region sees in the auction system.

Another disadvantage listed by large numbers of the auction

sellers; they felt the consumer received insufficient benefit from periods of low prices, but also commented that they couldn't see how other bulk systems could improve this. The major remaining disadvantages seen by some of the growers were:

(a) the lack of liaison and trust between the auction firm and the growers e.g. some growers wonder whether the reason given for low prices is the true one. "If poor quality or transit damage is given as the reason for low prices when the real problem is over-supply, then it is better to let the grower know this".

(b) Country Order Firms - the opinions given were divided on this count. About half the growers who mentioned these firms considered that they were a bad thing - the other half who mentioned them considered that they were a good system, "as they effectively created a floor price for the auction each day".

(c) collective buyers received a small mention as did ring buyers. The growers who mentioned these types of buying considered that their presence was undermining the auction system. Little fact was offered to support the claims.

(d) the following disadvantages came almost exclusively from Roxburgh.

  (i) No premium is received for fruit quality. This opinion was expressed by a small minority of growers in this region who were factory suppliers.

  (ii) The high working capital compared with a factory orientated property is a disadvantage. This capital

is required for more picking labour, more packing labour, cases to be stored and made up and transport.

(iii) Brown Rot. A few growers claimed that their market prices were depressed by Brown Rot and that it paid to sell by a method which disposed of fruit before the fungus could spread.

4.2 Avenues for Improving the Auction System

Many growers offered suggestions for improving the auction system. These are listed below.

(1) The Dutch Clock system of selling be installed.

(2) A uniform system of size grading be set up. Growers know that there are many systems of size grading for apricots and that even if two growers are using the same system, they don't necessarily have the same sizes under the same grades.

The exponents of this philosophy feel that uniform size grading would result in improved buyer knowledge and that would lead to better prices, especially for better packs.

(3) Some growers wanted better market intelligence, especially as assessment of quantities already consigned to distant markets.

(4) Other possible means of improvement, such as co-operatives, central selling etc., received little comment at all.

5. Processing

Processing includes all fruit sold for manufacture. No

attempt was made to discriminate between the companies that the fruit was consigned.

5.1 Selling to Processors

The major advantage listed by growers was that for the fruit sold to the factories, they received a better net price. They felt firstly, the time and cost involved in picking the fruit was reduced compared with the other sales avenues; secondly, less working capital and overheads are required; and thirdly, one advantage listed even by non-suppliers, that the fruit sold to the factory, is fruit off the open market which helps keep the auction prices up.

Factory suppliers also stated that payment was fixed and prompt and they found it an advantage to be able to plan using their knowledge of prices and expected crops.

5.2 Disadvantages of Selling to Processors

Apart from the proportion of growers who do not supply the factory because they obtain a better price elsewhere, the only disadvantages listed were fairly negative ones. Some growers listed as a disadvantage the opinion that their blocks of apricots eligible for factory supply, were too small. Others felt that their distance from the factories virtually prevented them from supplying processors.

The only disadvantage which was pertinent to the actual processing system, is a liaison problem. Some growers claimed that they had been subject to down-grading for which no explanation was given, and others complained of a lack of communication

efficiency, which at times, has lead to misunderstandings and discrepancies between what quantity growers think is required and the quantity which the factory wants.

In general, growers who supply the processors could see little to fault this method of sale.

6. Gate Sales

This category includes all methods of sale to private consumers who buy either from the orchard itself or from a stall, the buyer removing the fruit from the selling point himself.

6.1 Advantages of Gate Sale

(a) The primary advantage which was listed by approximately half the growers in all regions was that the grower knows what price he will receive.

(b) Another major advantage was that this outlet was supplying a demand not represented on the market floors.

(c) Many growers consider another advantage of gate sales stems from the fact that the fruit must be mature, so that the riper fruit (unsuitable for transportation) can be sold from a stall.

6.2 Disadvantages of Gate Sales

(a) Nearly 20 per cent of the gate sellers felt that pilfering was a serious disadvantage.

(b) Others claimed that gate sales competition was causing price cutting which was to no ones advantage.

(c) The majority of growers claimed that in their experience

the amount of work required to present the fruit, the labour required to sell it, and the interruptions to shed routine, rendered this method of sale impracticable.

(d) A common disadvantage mentioned was the dissatisfied customer. Some growers felt that the dissatisfied customer took a disproportionate amount of time, and that often the source of dissatisfaction was not due to the orchardist but to the customer not knowing which fruit to select.

(e) Many growers felt they couldn't charge the extremely high prices available for some early premium quality fruit on the market and felt that this was a disadvantage as they need this fruit on the stall to attract a large clientele.

Many growers were sited in positions where the traffic incidence was too low to warrant gate sales. Sixty per cent of the Cromwell growers, 44 per cent of the Alexandra growers and 26 per cent of the Roxburgh growers felt that this was the case.

7. Mail Order

The majority of growers could see no advantage in mail order systems for stone fruits.

Sixty-five per cent of the Cromwell growers felt mail order sales did not adequately repay the extra time, book-keeping expense and worry involved. Sixty-three per cent of the Alexandra growers and 89 per cent of the Roxburgh growers supported this opinion. Almost all of these growers only supply a few cases of fruit to their relatives and friends. A small minority of

growers consider that when they supply good fruit to their mail order buyers, they can ask a suitable price. They considered that the system has the advantage of the grower knowing his return. These two factors have moved them to establish their mail order systems.

All sections mentioned that it is hard to get the fruit to the consumer in good condition.

8. Direct Sales

Direct sales to the retail industry were almost universally condemned by growers. Roxburgh and Alexandra growers with 80 and 61 per cent respectively, considered the major disadvantage resulting from supplying retail outlets directly, was that this activity would "undermine the auction system". The growers were worried and said they had experienced the effects of direct sales in some areas. They felt that large retail concerns could feature and advertise a line of fruit in such a way as to set the price in that sales area.

Other disadvantages listed were that a grower could not sell his whole crop to the one organisation by private treaty. They felt that the price differential for quality would be reduced in the middle range and that some fruit would not be saleable, especially smaller, lower quality fruit.

Some growers were interviewed who have supplied apricots in quantity to retailers but have since ceased this method of sale.

Other growers however, while being somewhat worried by the above remarks, consider that they are being paid very well for

their fruit by direct buyers - they can pick, pack and consign in bulk and that these advantages far outweigh the disadvantages of the auction system.

Direct sale of fruit in the Cromwell region appeared to be more for local and non auction supplied regions, e.g. The Southern Lakes growers who were supplying this demand mentioned a problem unique to their area - bad debts. Many have found this is a major disadvantage. Others said that the lack of uniformity of demand by these retail buyers was a problem which set direct selling at a disadvantage to the auction system.

9. Others and Exports

The exporting of fruit was considered by its associated growers to be a good proposition. The supplying of this market through an agent who guaranteed the price had many advantages for the growers and the industry. The price paid was enough to provide a reward for the extra cultural and packaging costs associated with exporting.

Others included miscellaneous sales outlets such as hawking which are of such little significance as to not warrant comment.

10. Comments and Conclusions

In general the growers who use the auction system feel that with its faults it is the best system available, for selling fruit to the public.

The processors are supported by many growers who consider they obtain a better price, and by others who feel they are

keeping the open market price up by keeping some fruit off the auction floor.

Other outlets have little significance.

APPENDIX III

```
// FOR
*IOCS(CARD,1132 PRINTER)
*ONE WORD INTEGERS
*LIST SOURCE PROGRAM
      DIMENSION PRICE(9,40),COSN(9 ),PROPN(9),COST(9),TOP(10),ACOST(9),
     2AP(9,40)
      READ(2,50)PRICE,COSN,PROPN,COST,TOP,ACOST,AP
   55 FORMAT(IF12.3)
 50   FORMAT(9 F7.2)
      K=0
      IX=17
      NUMB=0
      DO 200 KI=1,40
      DO 200 KJ=1,9
  200 PRICE(KJ,KI)=PRICE(KJ,KI)-COST(KJ)
20    NUMB=NUMB+1
      K=NUMB
      TCOS=0
      TPROF=0
      TGROS=0
      GROSS=0
      PROFT=0
      FACP=0.0
      STOCK=10000
      HI=1000
      LO=10
C     STOCK IS THE YEARS PICK
      IDATE=0
1     IDATE=IDATE+1
2     CALL RANDU(IX,IY,RN)
      IX=IY
C     RN IS THE DAILY PACK OUT AND IS IN THIS CASE RANDOM,+FROM A
C     UNIFORM CURVE
      RN=RN*50
      IF(RN-HI)3,3,2
    3 IF(STOCK-RN)4,4,5
    4 RN=STOCK
      GO TO 100
    5 IF(RN-LO)2,100,100
C     THE DAILY PACK OUT IS NOW COMPLETE
C     PROGRAM ONE SENDING CROP TO HIGHEST PRICE MARKETS DEDUCTING COSTS
  100 CONTINUE
      TOPP=0
      L=0
      J=0
      I=0
      N=I
      DO 12 J=1,9
      DO 11 I=1,9
      IF(TOPP-PRICE(I,IDATE)104,11,11
```

PAGE 2

```
  104 TOPP=PRICE(I,IDATE)
      IDENT=I
   11 CONTINUE
      AP(IDENT,IDATE)=PRICE(IDENT,IDATE)
      PRICE(IDENT,IDATE)=0
      GOTO(51,51,51,52,52,52,53,53,53),J
   51 INEW=IDATE+1
      GOTO54
   52 INEW=IDATE+2
      GOTO54
   53 INEW=IDATE+3
   54 TOPP=PRICE(IDENT,INEW)
      TOP(J)=TOPP
      ACOST(J)=COST(IDENT)
      TOPP=0
   12 CONTINUE
C     NOW HAVE PRICES RANKED
      COSN(N)=RN/K
      INT=COSN(N)
      COSN(N)=INT
      DO 13 L=1,K
      PROFT=PROFT+TOP(L)*COSN(N)-ACOST(L)*COSN(N)-FACP*COSN(N)
      GROSS=GROSS+TOP(L)*COSN(N)
      TCOS=TCOS+COSN(N)
   13 CONTINUE
      COSN(N)=0
      IF(36-IDATE)40,40,1
   40 TPROF=TPROF+PROFT
      TGROS=TGROS+GROSS
      WRITE93,6)TPROF,TGROS,NUMB
    6 FORMAT(/,1X,'TOTAL PROFIT $',F9.2,1X,'TOTAL GROSS $',F92.,/,1X,' T
     1HERE WERE',13,1X,'MARKETS PATRONISED')
      DO 60 IDATE=1,40
      DO 60 IDENT=1,9
   60 PRICE(IDENT,'DATE)=AP(IDENT,IDATE)
      AVG=TGROS/TCOS
      AVP=TPROF/TCOS
      WRITE(3,105)TCOS,AVP,AVG
  105 FORMAT(1X,'TOTAL CASES CONSIGNED',F6.1,1X,'AT AN AVERAGE PROFIT OF
     3',F7.2,1X,'FROM A TOTAL AVERAGE GROSS OF',F8.2)
      IF(.9-STOCK)102,42,42
102   IF(9 -NUMB)41,41,20
 42   WRITE(3,7)STOCK
    7 FORMAT( 'STOCK EQUALS', F7.3)
```