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# HILLSIDE AGRICULTURE

## SUB-PROJECT

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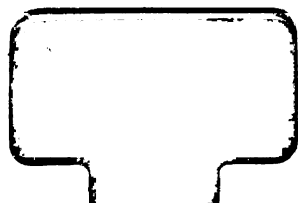
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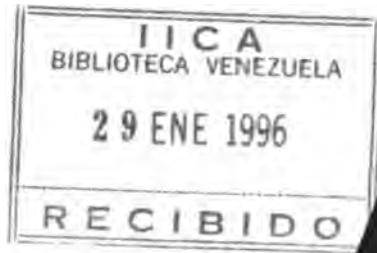
Wholesale Seasonal Price Variation For the Coronation Market

A. Shaun-Marie Grant  
Jamaica, W.I.

December 1994







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"The views expressed in signed article are those of  
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**WHOLESALE SEASONAL PRICE VARIATIONS  
FOR THE  
CORONATION MARKET**

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**1. INTRODUCTION**

Beyond agronomic considerations for farmers to produce, price is an important, if not the most important, variable in the production equation. The knowledge of price variations in a given market is of crucial importance for the farmer's decision-making process with regards to the choice of crops and their time of planting. Additionally, it also influences the typical small farmer's cash flow situation as well as management of his/her scarce resources.

This report provides information regarding seasonal price variations at the Coronation market for a number of crops. As such, this study is geared as a farm planning tool for both extensionists and farmers.

This study was carried out in the last quarter of 1991 and early 1992, on the seasonal price behaviour of twenty crops. The crops reviewed, were: Coco, Dasheen, Irish Potato, Sweet Potato, Yellow Yam, Cabbage, Carrot, Cucumber, Iceberg Lettuce, Manalucie Tomato, Pumpkin, Roma

Tomato, String Bean, Sweet Pepper, Dried Gungo Peas, Red Peas, Escallion, Onion, Grapefruit, Lime and Orange.

A seasonality analysis was done utilizing data from the Ministry of Agriculture (MINAG)'s Marketing Division. As a result, an index was constructed for each crop after analyzing their price behaviour over a five year period, 1986-1990.

Following an explanation of the key concepts and terms, the results of the seasonality index are presented for each crop according to its parent category. The categories are as follows : Tubers, Vegetables, Grains and Pulses, Condiments, and Citrus . This section is followed by a tabular summary of the general results. A brief explanation of the methodology is then given in Appendix I and a presentation of individual graphs in Appendix II.

**1.1 Role of Coronation Market**

The Coronation Market was selected because of its importance in the agricultural marketing system in Jamaica.

According to the Higgler's Survey (1978), it is one of the nine (9) parochial markets found in Kingston and St. Andrew for it was estimated in that year, that 40% of all higgler's in the country, sold their produce at the market. It should be added that parochial markets are the largest channel of distribution for domestic crop production.

Furthermore, the existence of the market is of vital importance to small farmers as approximately 50% of the higgler's who sell in the market purchase their goods at the farmgate.

#### 1.1.1 Functions of the market

The Coronation market serves firstly, as a major wholesale market. Hence, it provides farm produce for resale at other curbside markets scattered across the corporate area therefore, its prices will be lower than those at other markets.

It also serves a transfer market as well as a retail outlet, especially for low-income consumers. Below are some of the characteristics of the market.

#### 1.1.2 Characteristics of the market

##### 1) No storage facilities

Although the market has undergone upgrading within the last few years, there are still no cold storage facilities or dry storage space. As most of the farm produce are of a

perishable nature, they must be sold within a short time.

##### 2) Cash on delivery

The method of payment between sellers and consumers is cash.

##### 3) No standardized grading

The sellers are the persons who carry out the grading of produce. However, this process is quite subjective. Hence, farm produce with different grades will have different selling prices.

##### 4) Varying market prices

Selling prices are known to differ among various locations of the market at any particular point in time. It also varies on a day to day basis with the lowest prices being obtained at the very end of the week. Hence, the average selling price was obtained and used.

##### 5) Higgler's, the main sellers

The main sellers in the market are higgler's, most of whom buy their stock directly from the farmers. The Higgler's Survey distinguishes between various types of higgler's who sell in this market, such as higgler/farmers, professional higgler's and weekend higgler's.

## 2. CONCEPTS AND DEFINITIONS

In order to analyze the pattern of price changes over a typical 12-month period, the methodology employed involved the use of index numbers.

For the purpose of this report, an index is defined as "a statistical measure designed to show changes in a variable or group of variables" [1] with respect to some specified characteristic.

In this case, price is analyzed with reference to time in months. As such, two concepts have been utilized : a base index and a seasonal price index.

### 2.1 Base Index

The base index represents the annual average for the period and has no variations in price from the yearly general trend. As a constant value, ( the base index is always assumed to be 100 ), it measures any fluctuations in relative values.

### 2.2 Seasonal Index

The seasonal index shows the seasonal price pattern based on the average monthly prices over a period of years. Therefore, it shows any regular variations from the yearly trend. For example, if the seasonal index in January, for Produce A, is 150, January's prices would be 50% above the general trend's prices. On the other hand, if the seasonal index in March is 80, this means that March's prices would be 20% below the general trend's prices ( and base index). Hence, one can easily ascertain the months of relatively high and low prices for a selected crop.

[1] Page 313, in 'Theory and problems of Statistics' by M.R.Speigel

## 3. MARKET PRICE BEHAVIOUR

The Higglers' Survey reported that there was seasonality in prices in the various markets but suggested that the main cause was the seasonality of supply. The results of the price study for the Coronation Market confirms this behaviour in prices. However, the study provides no conclusive results about this causal relationship.

The seasonal behaviour in Coronation wholesale prices is similar for most of the twenty one crops under study. With the exception of Citrus, sellers of these various crops should receive their highest prices in the Christmas months and lowest in the Summer.

There are also seasonal price differences among and within specific crop categories. The information on monthly price variations will be presented in the following categories :

- Tubers
- Vegetables
- Grains and Pulses
- Condiments
- Citrus

In each category, there is a general summary on the typical behaviour of wholesale prices throughout the year for crops within the grouping. There is also a detailed description for each individual crop. However, individual graphs for each crop are located in the Appendix.

#### 4. PRICE BEHAVIOUR BY CROP CATEGORY

##### 4.1 TUBERS

The prices for tubers are fairly constant throughout the year. Tubers seem to be the most stable grouping in terms of seasonal variations. Most of the crops in this category share a similar variation in monthly wholesale prices.

As shown in Figure 1, the highest prices for tubers can be obtained in the last three months of the year and this tendency towards high prices continue into the first quarter. This can be partly explained by high export demand for coco and dasheen during these months.

The main exception to this seasonal trend is yellow yam. Prices for this yam are at its highest in the summer months and at its lowest, in the Christmas months.

##### 4.1.1 Coco

Wholesale market prices are fairly constant throughout the entire year. This price stability could be due to the crop being harvested all year round. Prices dip only slightly during the months of May-September, when they are 10% less than the base index. Sellers should get the best prices in the October-December period, when they are usually 10% higher than the base index. This coincides with the months of the heaviest harvests, October-February.

##### 4.1.2 Dasheen

Although wholesale market prices remain fairly stable for most of the year, they are usually 10% lower than the base index. Like coco, there is continuous reaping throughout the year, with the highest production in the months, October-February.

In August, October and September, sellers should receive the best prices which are usually 10% above the index. This period of relatively higher prices coincide with the period of lowest domestic production for the year ( which normally occurs in the third quarter).

##### 4.1.3 Yellow Yam

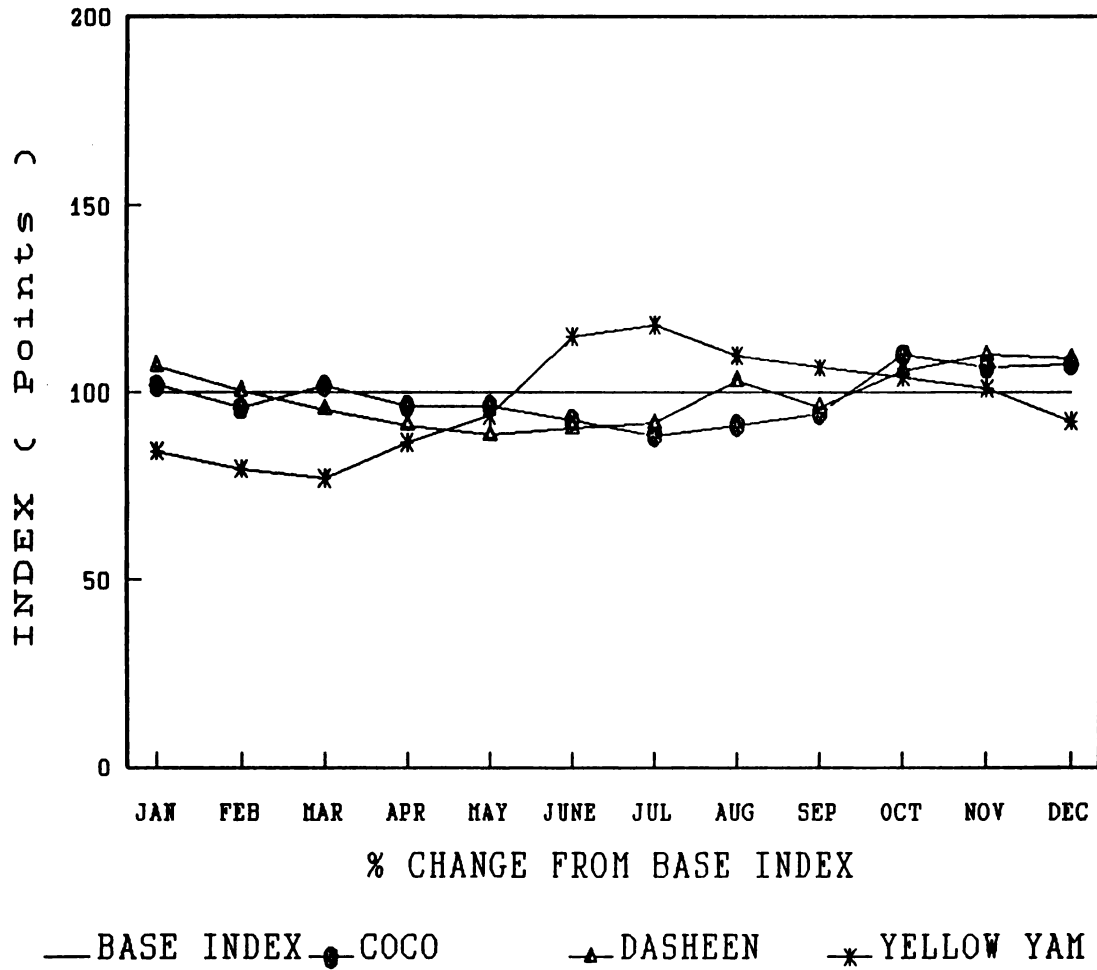
Unlike the other tubers, the highest prices will be received in the summer months. They increase approximately 10% above the base index in June and July. National domestic production is at its lowest for the year during this third quarter.

Although there are no wide differences in price for the year, they are slightly lower in the November-May period, falling as low as 20% below the index. This period coincides with the traditional harvesting times for the late crop, which occurs in December and the early crop in June.

Figure 1

# TUBERS

## SEASONAL PRICE VARIATIONS



As shown in Figure 2, sellers can expect the lowest prices for both irish and sweet potato in the second and third quarters. However, prices for irish potato, peak earlier than that of sweet potato. Thus, the highest prices for irish potato can be received in the August/September period and for sweet potato, in November and April.

#### 4.1.4 Irish Potato

There is a gradual decline in prices during the months of March-August. For instance, sellers will receive prices in June which are approximately 40% lower than the base index. This coincides with the harvesting of the Spring crop in May-July. However, there is a sharp price increase in August, which continues into September and October. For instance, prices are nearly 50% above the base index in September.

There is another decline in price during during the last two months of the year. This could be due to increased supplies from the harvesting of the summer crop, that usually starts in October.

In a Demand study for Irish Potato done by the Data Analysis section, MINAG, three main factors are cited for this price behaviour, namely :

- (1) constant fluctuations in production of the crop;
- (2) inadequate market network;
- (3) impact of demand from hotels and fast food outlets.

The study concluded that demand for Irish Potato is relatively stable. Price increases or decreases will lead to small changes in the quantity demanded.

#### 4.1.5 Sweet Potato

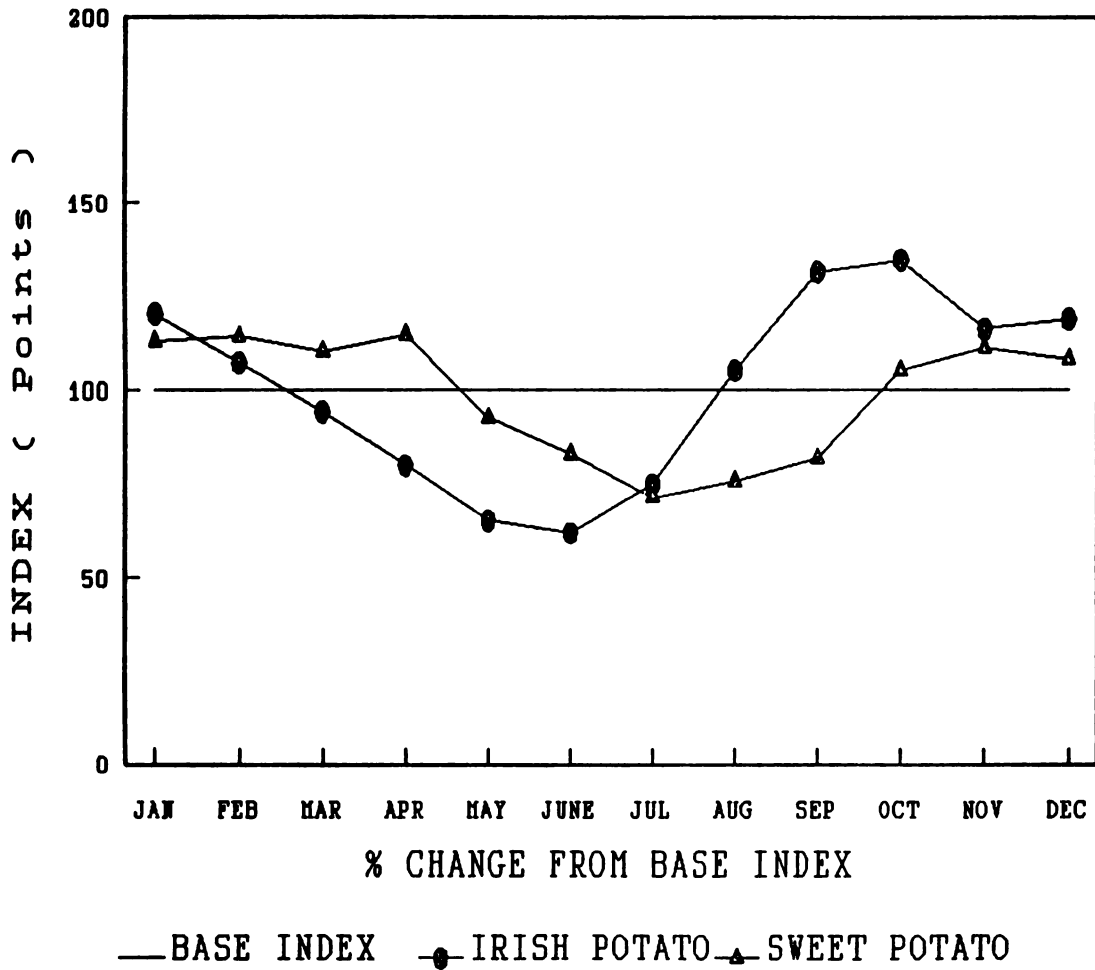
There is a gradual decline in prices during the months of May to September, falling approximately 25% lower than the base index in July. This could be explained by the fact that the dry, summer months are the traditional harvest times with the highest production in August.

However, sellers should get the best prices, that is, 10% above the base index in the Winter and Easter months, particularly in November, January, February and April. Statistics for domestic production indicate that the lowest harvests usually occur in the fourth quarter.

Figure 2

# OTHER TUBERS

## SEASONAL PRICE VARIATIONS



## 4.2 VEGETABLES

This category, in contrast to that of tubers, has the most pronounced monthly price variations. The seasonal trend in wholesale prices for vegetables, as shown in the following diagram, indicates the highest prices can be obtained in fourth quarter of a typical year and the lowest in Spring. Figure 3 shows that certain vegetables which can be planted all year round, such as, cucumber and pumpkin, have a similar behaviour in prices. There is a gradual decline in prices between March and July, but the recovery is somewhat erratic in the following months.

### 4.2.1 Cucumber

There is an erratic behaviour in prices over a typical year. As the crop can be grown in more than one planting season, sellers can benefit from above-the-index prices in February and July. The lowest prices are in May and later in September and November, when prices are 10-25% less than the base index.

### 4.2.2 Pumpkin

There is a gradual decline in wholesale prices for pumpkin for the first six months of the year, with prices as low as 25% below the base index in June. This coincides with the months in which there is the highest domestic production of pumpkin. Sellers should get their best prices in November, December and March when prices are 10-20% above that index.

### 4.2.3 Sweet Pepper

This situation follows the typical pattern in vegetable prices for a year. In other words, there is the usual dip in wholesale prices for the Easter and summer months. The lowest price will be received in June when the seasonal index is approximately 40% below the base index. On the other hand, sellers should benefit from higher prices in the fourth quarter, particularly in November, when these prices are approximately 60% above the base index.

### 4.2.4 Tomato Varieties

#### 4.2.4.1 Manalucie Tomato

There are depressed prices for Manalucie tomato during the first half of the year, with a low of approximately 40% in June. This coincides with the two quarters of the highest domestic production. However, sellers should receive their best prices in August, October and November, when prices are almost 25% higher than the base index.

#### 4.2.4.2 Roma Tomato

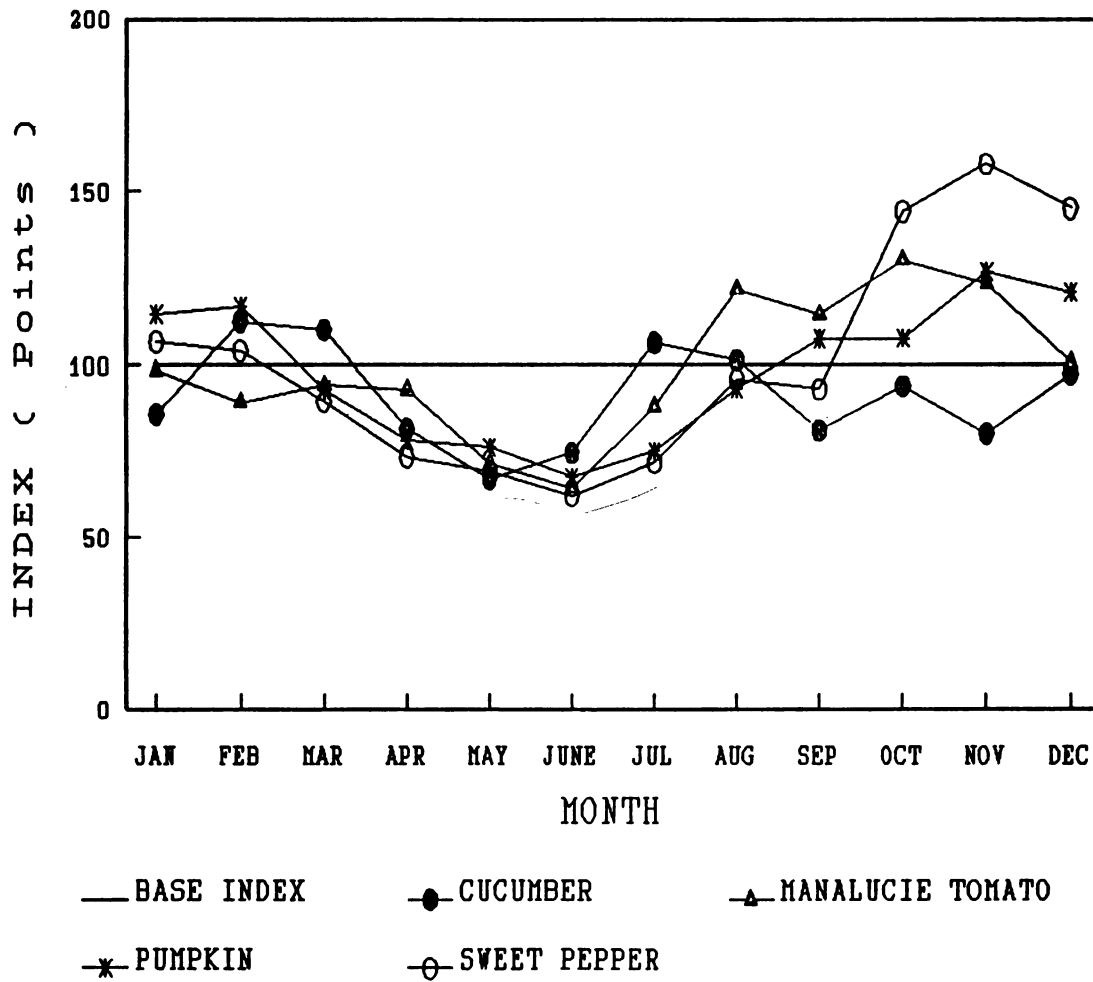
The monthly trend in prices, is somewhat similar to that of the Manalucie tomato. However, declines and increases in price are sharper and steeper than that of the Manalucie variety. For a graphical representation, consult Appendix II. Sellers should receive the highest prices in September, October and particularly in November, and the lowest in February, May and June.



Figure 3

# VEGETABLES

## SEASONAL PRICE VARIATIONS



#### 4.2.5 Other Vegetables - Cool Season

As shown in figure 4, vegetables which do best when planted in the cooler season exhibit a particular behaviour in monthly prices. There is a steeper decline in prices between January and June, (with a brief interruption in April) and a general recovery in the last two quarters of the year.

##### 4.2.5.1 Cabbage

The prices are relatively low for most of the year, and fall as much 50% below the base index during the second quarter. This can possibly be explained by highest domestic production occurring in the first two quarters.

Sellers should get the better prices in the September-December period, when they should receive almost 70% above the base index.

##### 4.2.5.2 Carrot

For the first half of the year, prices are usually lower than the base index, which coincide with the biggest increases in domestic production. In April, prices are almost 50% less than that index. However, sellers should receive better prices in the October-December period, especially in November when prices are approximately 50% above the base index.

##### 4.2.5.3 Iceberg Lettuce

There are wide swings in price for Iceberg lettuce throughout the year. Its price falls gradually in December and dips

as much as 50% below the base index in April. This corresponds with the first two quarters of the year, in which there is the highest domestic production.

There is a slight improvement in June/July, followed by a sharp increase in August. It is in the third quarter, that domestic production is at its lowest for the year. Sellers should receive their best prices in September and October when prices are approximately 50% higher than the index.

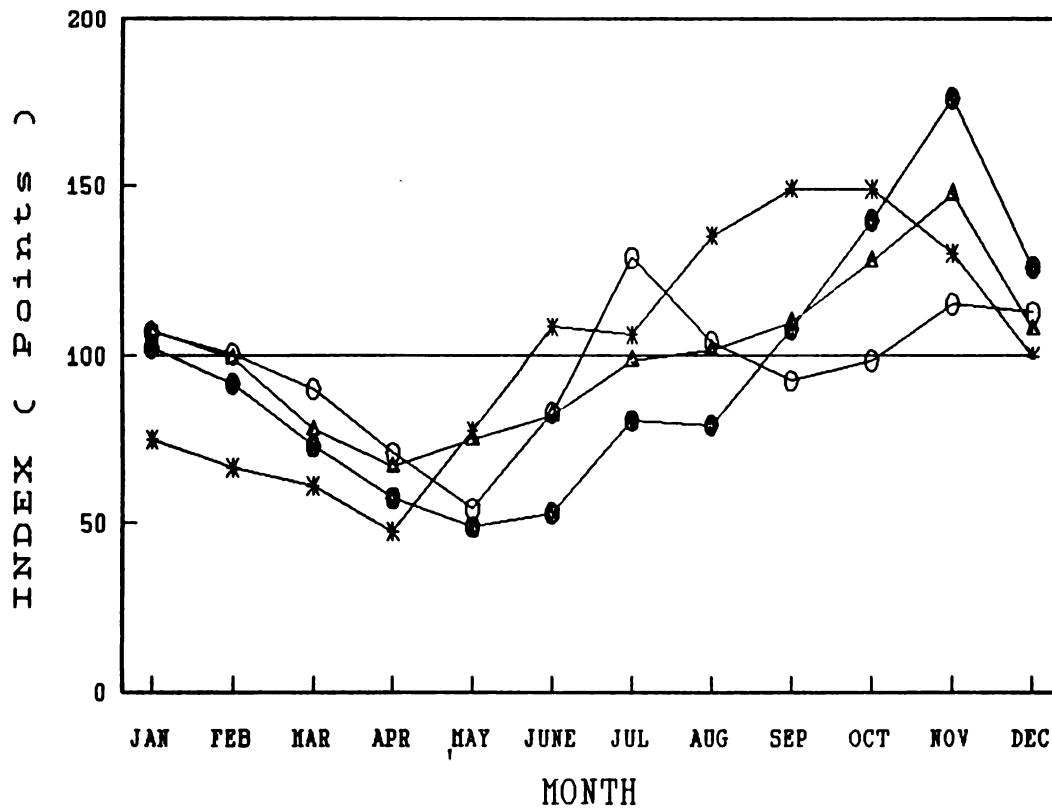
##### 4.2.5.4 String Bean

As there is more than one planting season for string bean, sellers should get their best prices in July and also November/December when prices are 10-30% higher than the base index. There is a gradual decline in prices after the Christmas months, with a low of 50% in May. This corresponds with the periods of highest domestic production of String Bean which occurs in the first two quarters of the year.

Figure 4

# OTHER VEGETABLES

## SEASONAL PRICE VARIATIONS



— BASE INDEX      ● CABBAGE      ▲ CARROT  
\* ICEBERG LETTUCE      ○ STRING BEAN

### 4.3 GRAINS AND PULSES

There are no similarities in seasonal trends of wholesale prices for the two crops, gungo peas (dried) and red peas. As shown in figure 5, the months in which one increases, the other is decreasing. For instance, the price for red peas increases in the first quarter with a peak in March, but for gungo peas, it declines. The situation later changes in June and September when the price for gungo peas increases and that of red peas decreases.

crop. This decline culminates with a deep plunge of over 50% below the index in September. During these months, domestic production is usually at its lowest level for the year

#### 4.3.1 Dried Gungo Peas

The Coronation wholesale prices for dried gungo peas are fairly constant throughout the year. However, they are usually 5% less than the base index. Sellers should receive their best prices in the Christmas months (October-January) when the prices are usually 10% above that index. This time of relatively high prices coincide with traditional harvesting months associated with the late crop, namely : November and December.

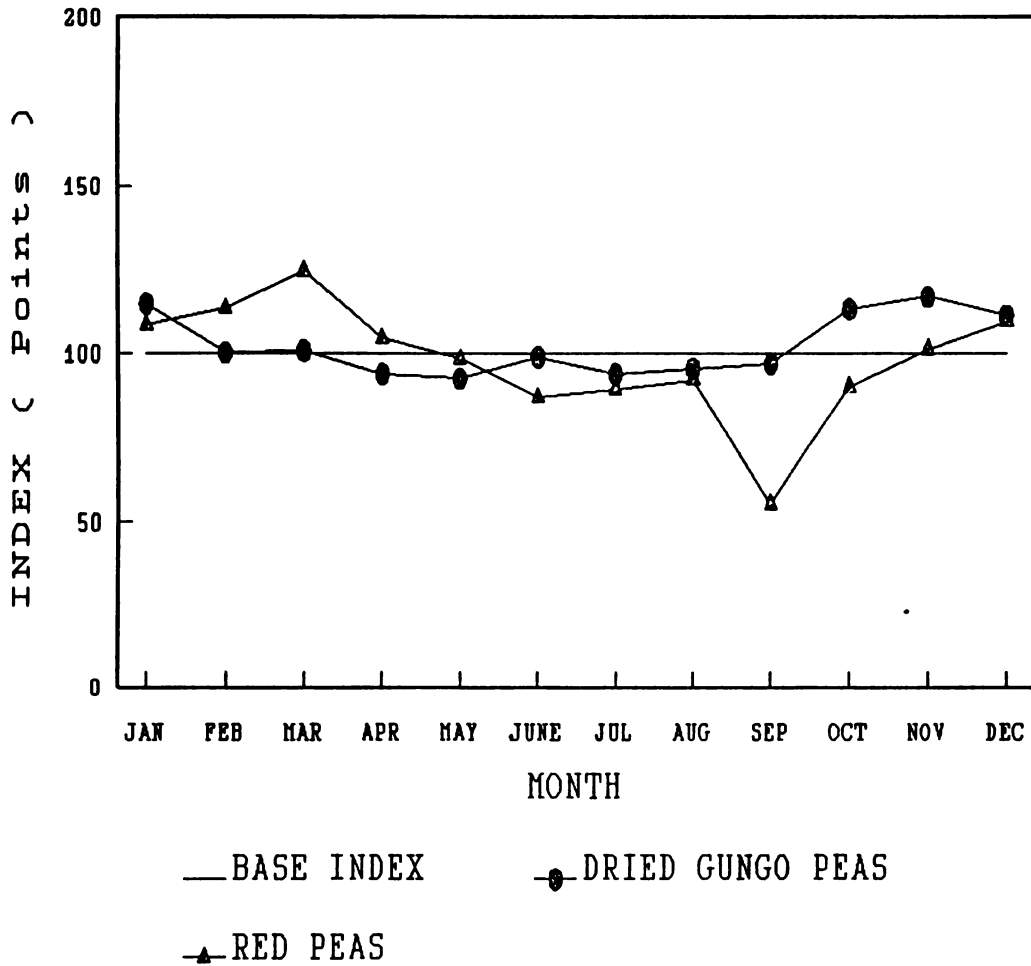
#### 4.3.2 Red Peas

There is an erratic behaviour of wholesale red pea prices throughout the year. Sellers should receive their best prices in the first four months (as well as in December) when prices are 10-20% higher than the base index. Prices start declining gradually in June and July, which are also the harvest times for the early

Figure 5

# GRAINS AND PULSES

## SEASONAL PRICE VARIATIONS



#### 4.4 CONDIMENTS

There is a similar trend in the seasonal variation in prices for escallion and onion for the first six months of a typical year. However, figure 6 shows a change in August, when there is a sharp increase in the price of escallion but a decline in that of onion. This divergence in price variations continues for the duration of the year.

##### 4.4.1 Escallion

There is an erratic pattern in wholesale market prices for escallion over the year. Prices are usually 10-25% lower than the base index for the first six months with the exception of March. However, sellers should get the highest price in August when the price is almost 50% higher than the index. Sellers should also get higher prices in September, October and November when the seasonal index is far above the base index.

##### 4.4.2 Onion

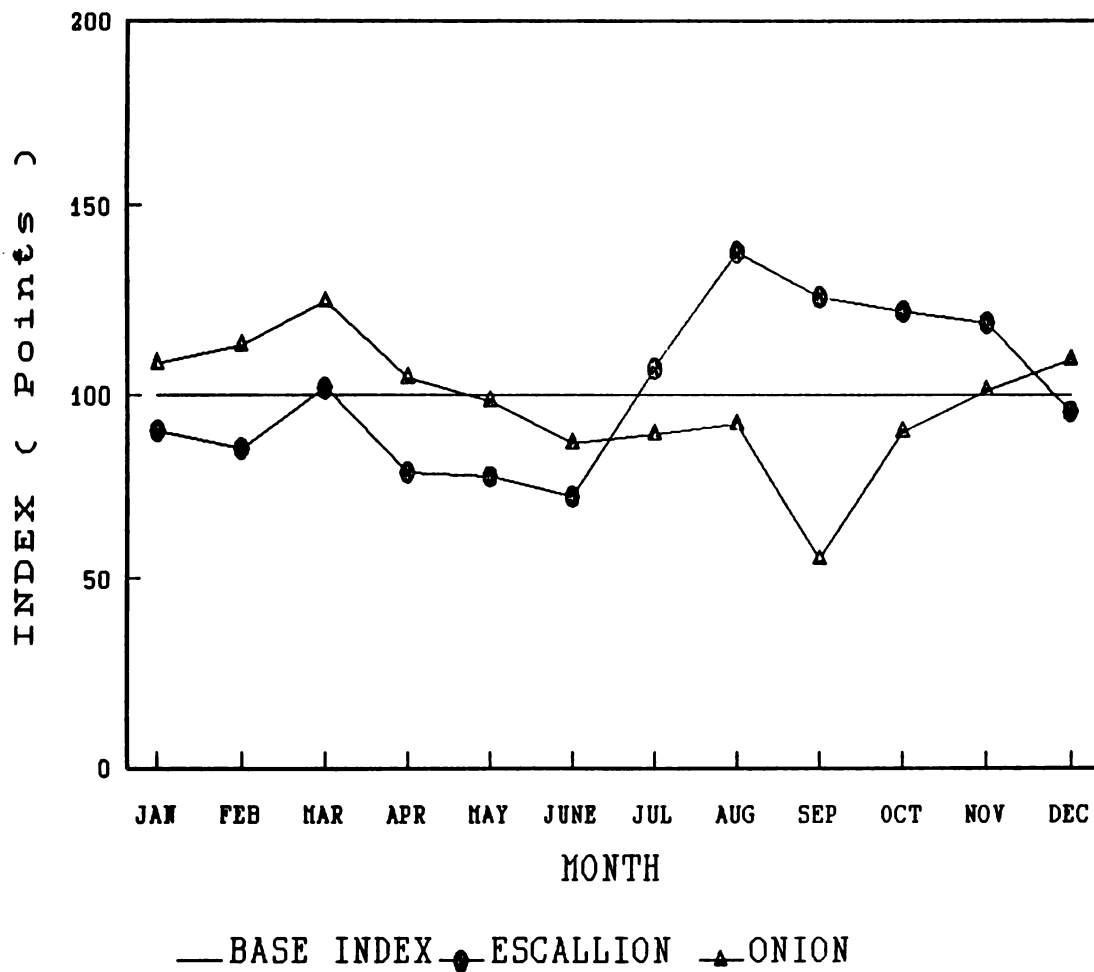
The pattern in Coronation wholesale prices for onion is slightly similar to that of escallion. Although the prices are constant for the first six months, they are usually 10% less the base index. This period coincides with the traditional harvest months of February, March, May, June and July.

This situation is followed by sharp increases in both July and August. Sellers should receive the best prices in September and October when prices are over 50% higher than that index. The index declines in November which is another traditional harvesting month.

Figure 6

# CONDIMENTS

## SEASONAL PRICE VARIATIONS



#### 4.5 CITRUS

The monthly price variations for grapefruit and orange are quite similar throughout the year. As shown in figure 7, wholesale prices are low in the first two months of the year and gradually increases during the second quarter, with the highest prices being obtained in the Summer months.

As shown in the graph, there is a gradual decline in prices during the fourth quarter.

This coincides with the traditional harvest times, beginning in August among the eastern parishes and ending later in December.

Lime is the sole exception in this category, with an opposite pattern in monthly prices. Sellers can expect to receive their lowest prices in the Summer months and their highest in Spring, (that is, the second quarter).

##### 4.5.1 Grapefruit

There are slightly depressed prices for grapefruit during the Winter and Easter months. The lowest prices will be obtained in December/January when the seasonal index is 10% lower than the base index. The wholesale market prices improve gradually in the spring months, but sellers should get the highest prices in the Summer. For example, July and August prices are usually 25% higher than the base index.

##### 4.5.2 Lime

There are sharp increases in the Coronation wholesale price in February and March. Sellers should, therefore, get the best prices during the Easter months, particularly in April when they are 200% higher than the base index. This situation is in contrast to July/August when prices are almost 50% below the base index. These prices remain below this index for the rest of the year.

##### 4.5.3 Orange

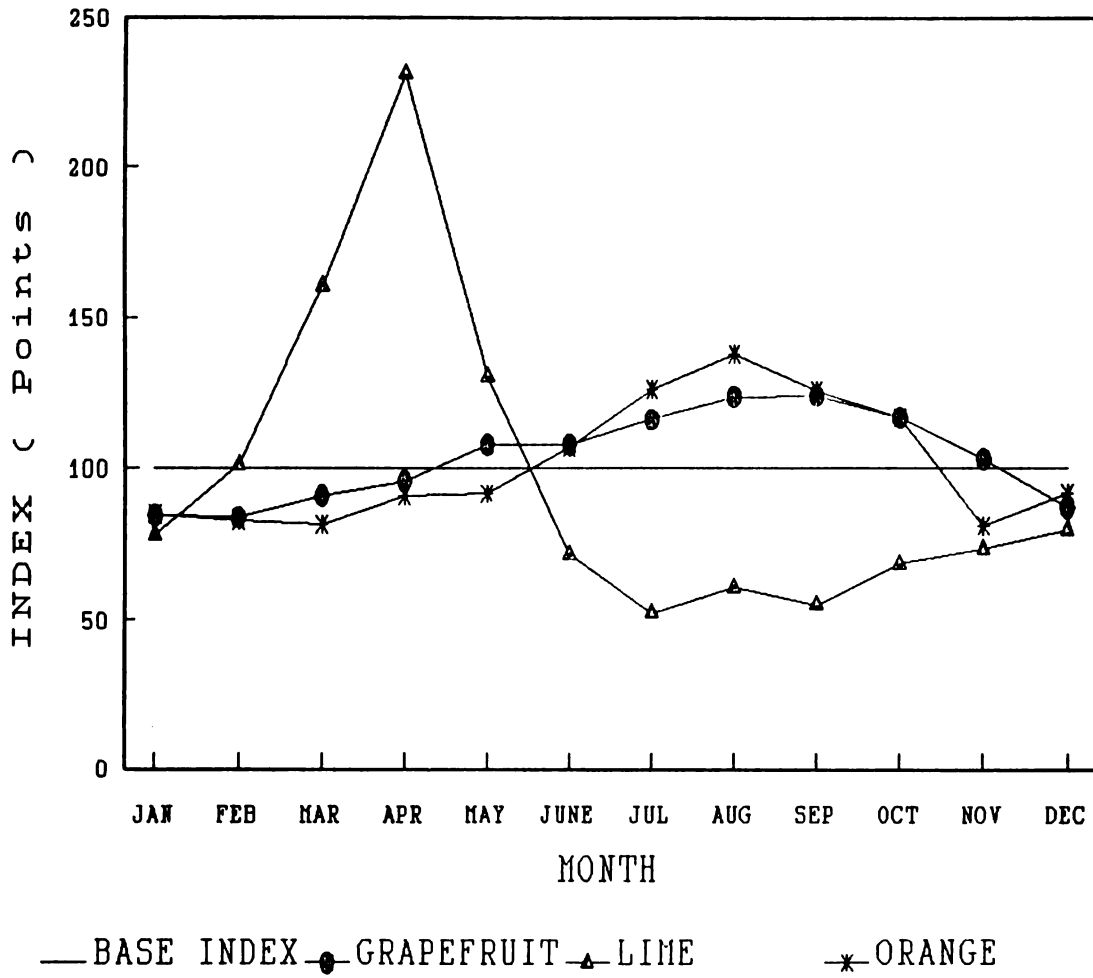
The seasonal behaviour for orange is similar to that of grapefruit. Coronation wholesale prices are below the base index for the first five months but improve significantly during the Summer. Therefore, sellers should get prices which are 30-40% above that index in July, August, September and October.



Figure 7

# CITRUS

## SEASONAL PRICE VARIATIONS



## 5. SUMMARY

Based on the results of the study, Jamaican farmers will be able to maximize their revenues from the sales of their crops by adopting certain farm management techniques, such as adjusting their time of planting as well as selecting those crop varieties whose harvesting times coincide with periods of high prices in the urban market places.

The table below summarizes the months in which sellers can obtain the highest and lowest prices for twenty one popularly traded crops that are sold in the Coronation market.

CROP	MONTHS	
	HIGHEST PRICES	LOWEST PRICES
Coco	October-December	June-August
Dasheen	August, October November, December	April-June
Irish Potato	September, October December, January	April-July
Sweet Potato	November, January February, April	June-September
Yellow Yam	June-August	January-April
Cabbage	October-December	March-July
Carrot	October-December	March-May
Cucumber	February, March, July	May, September, November
Iceberg Lettuce	August-November	February-April
Manalucie Tomato	August, October, November	May, June
Pumpkin	November, December January, February	April-July
Roma Tomato	September-November	February, May, June

CROP	MONTHS	
	HIGHEST PRICES	LOWEST PRICES
Sweet Pepper	October-November	April-July
String Bean	July, November, December	April-June
Dried Gungo Peas	January, October, November, December	April, May
Red Peas	February, March	September
Escallion	August-November	April-June
Onion	August, September	February
Grapefruit	July-October	December, January
Lime	March-May	July, September
Oranges	July-October	November, February, March

## **6. APPENDIX**

### **6.1 The Methodology of the Seasonality Analysis for Wholesale Prices Coronation Market**

The Seasonality Index has been obtained by a statistical method, known as the "Method of Moving Averages". This method "deseasonalizes the data", that is, it reduces the influence of trend, cyclical and irregular factors that could affect the accuracy of the results.

For the purpose of the analysis, monthly wholesale prices (Coronation Market) for the five year period, 1986-1990, were collected from the Marketing Division of the Ministry of Agriculture. The data were then entered into and processed by the Lotus Spreadsheet software package. After the index for the 12 months was computed, it was depicted as a Bar Chart for each market item.

It should be noted that the crops were chosen based on their ranking within the top 35 income earning cash crops for the period, 1984-88 [2]. Another important criterion for selection was the availability of reliable data on each item for the five-year period. If there were missing price data for many consecutive months of one or more years, that crop was not be selected for the analysis.

---

[2] Mulleady, J.T and Patzer, C.,  
Estimated Growth in Domestic Crops, Area, Yield and  
Production, 1969 - 1988

**APPENDIX II**  
**6.2 Price graphs for all crops**

As mentioned earlier in the report, the individual graphs for each crop are presented in this section. Each graph is in the form of a bar chart showing the monthly variations in prices for a typical year. Each graph also shows the monthly variation from the base index of wholesale prices. These graphs are not presented in crop categories, but instead individually. Therefore, they will be listed in an alphabetical order as follows :

□	Cabbage	:	page 22
□	Carrot	:	page 23
□	Coco	:	page 24
□	Cucumber	:	page 25
□	Dasheen	:	page 26
□	Dried Gungo Peas	:	page 27
□	Escallion	:	page 28
□	Grapefruit	:	page 29
□	Iceberg Lettuce	:	page 30
□	Irish Potato	:	page 31
□	Lime	:	page 32
□	Manalucie Tomato	:	page 33
□	Onion	:	page 34
□	Orange	:	page 35
□	Pumpkin	:	page 36
□	Red Peas	:	page 37
□	Roma Tomato	:	page 38
□	String Bean	:	page 39
□	Sweet Pepper	:	page 40
□	Sweet Potato	:	page 41
□	Yellow Yam	:	page 42

Figure 8

# CABBAGE

## SEASONAL PRICE VARIATIONS

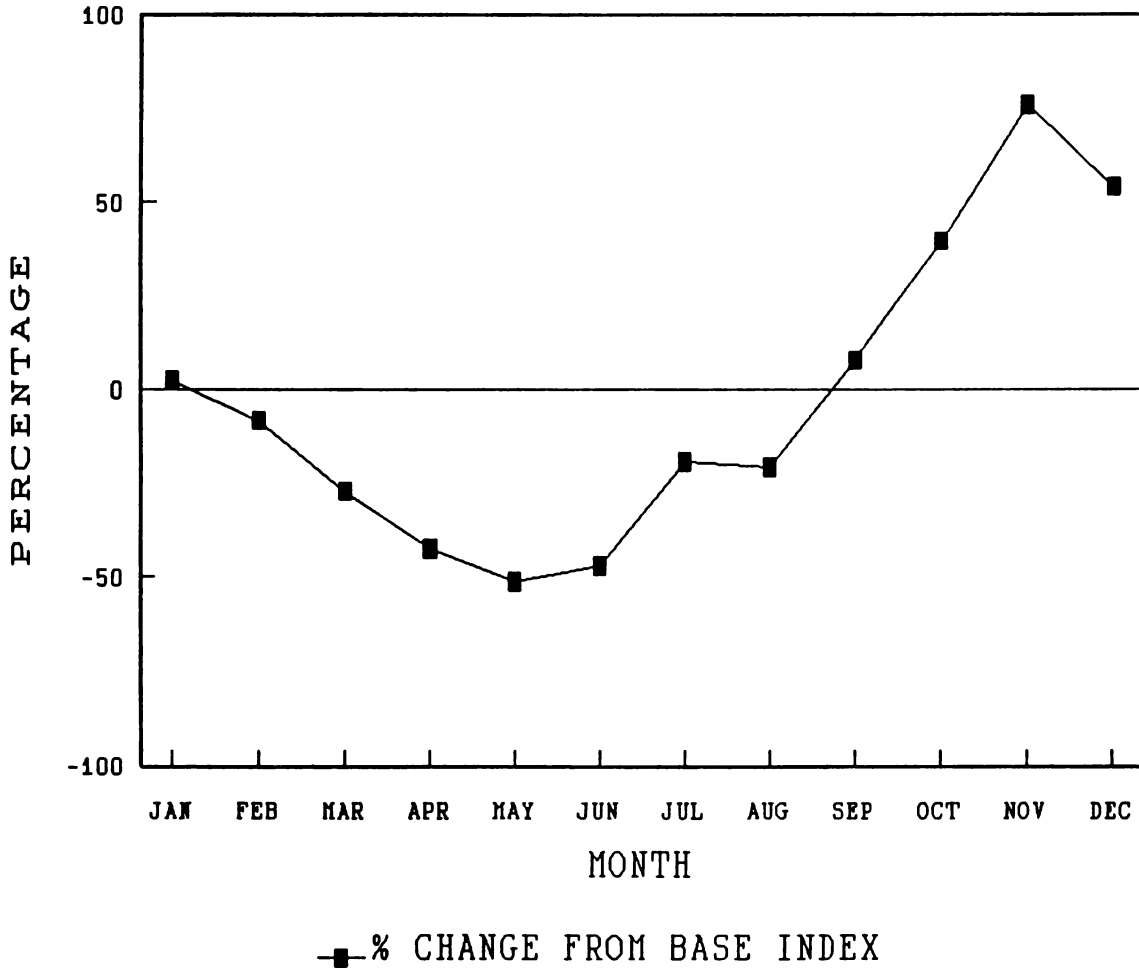


Figure 9

# CARROT

## SEASONAL PRICE VARIATIONS

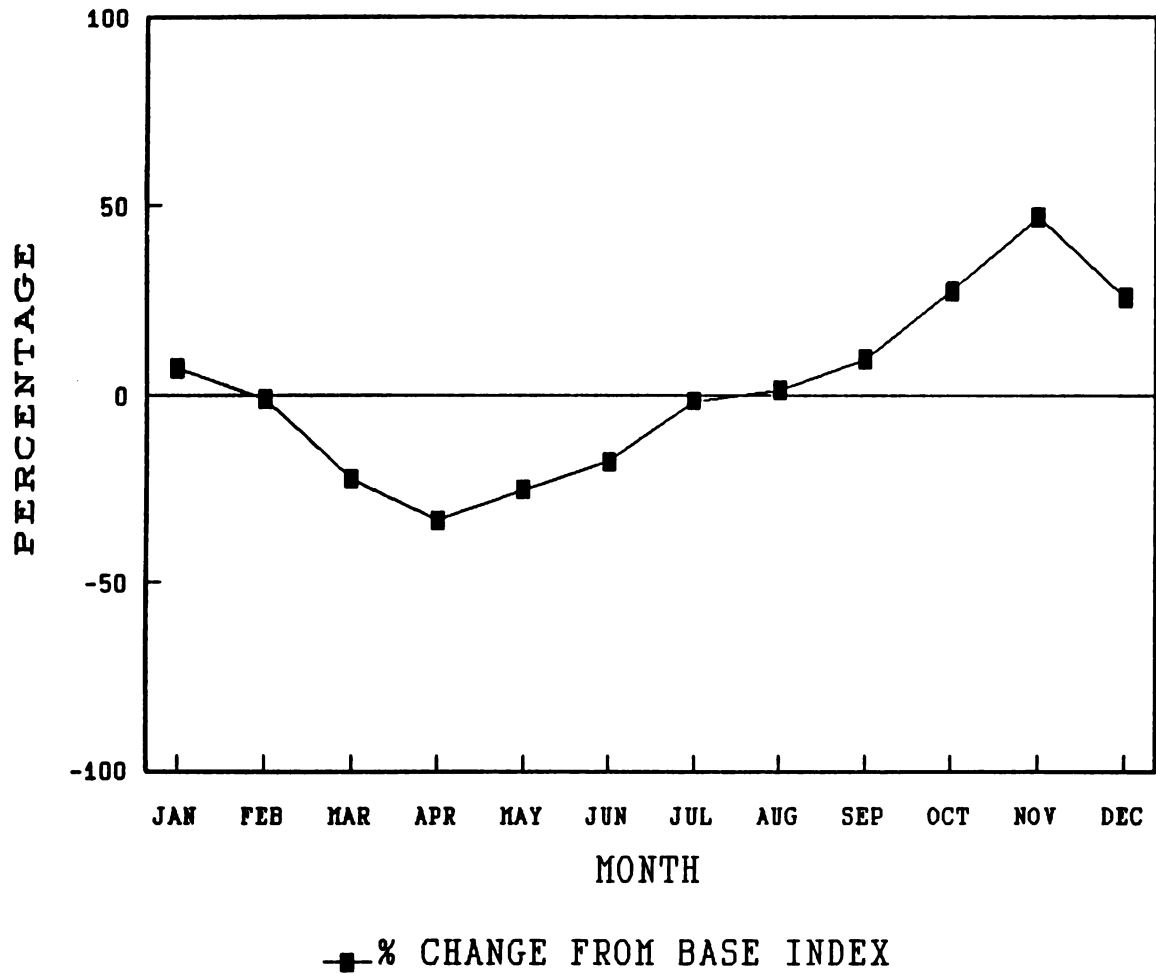


Figure 10

C O C O

SEASONAL PRICE VARIATIONS

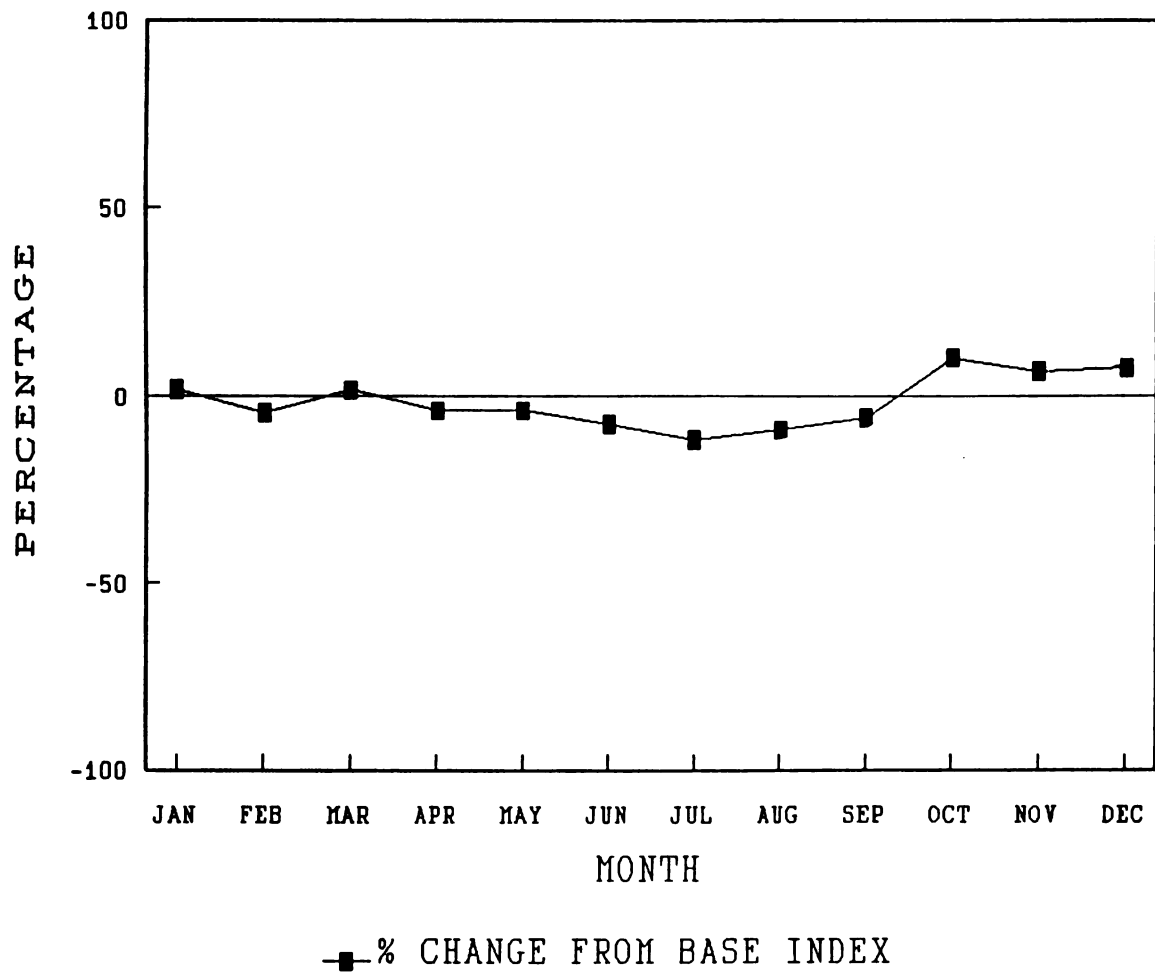




Figure 11

# CUCUMBER

## SEASONAL PRICE VARIATIONS

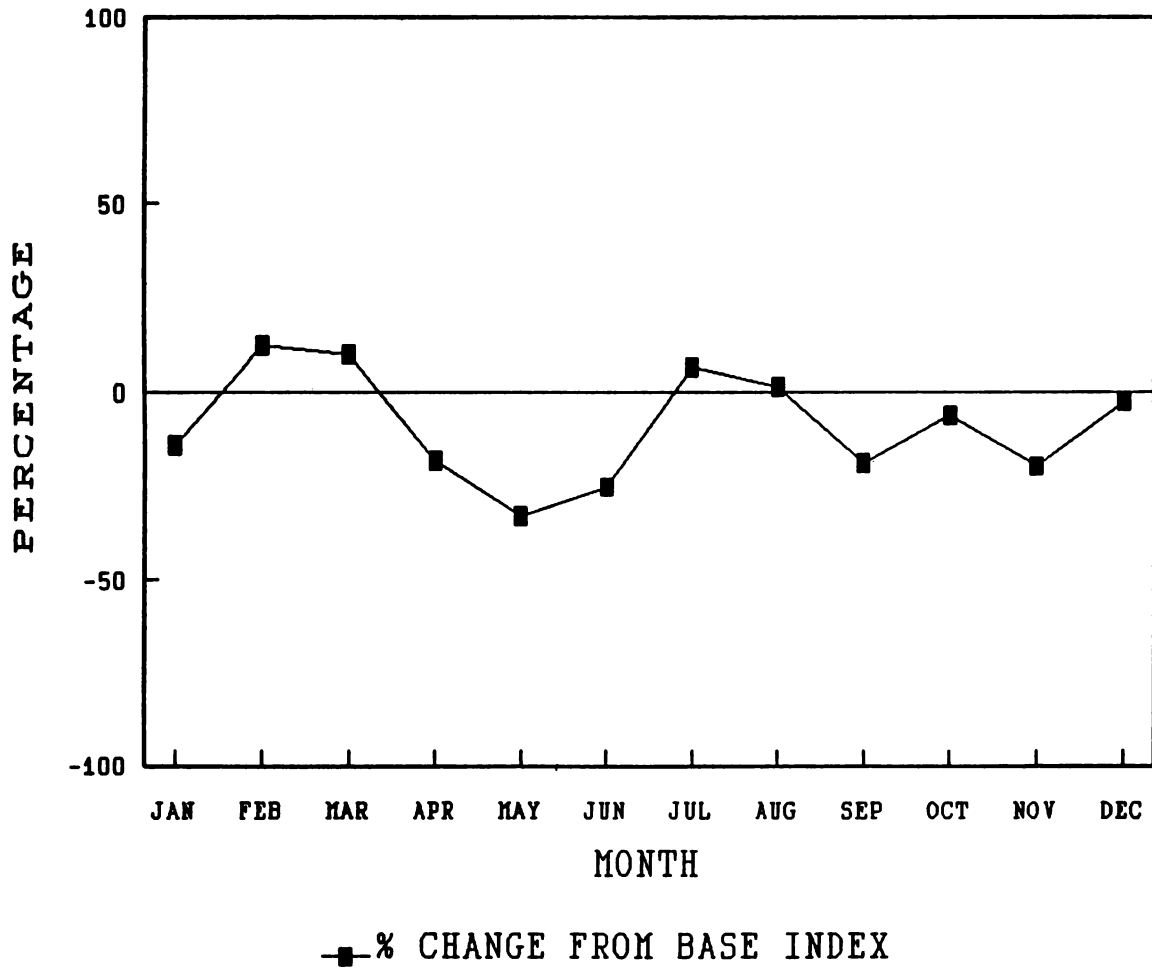


Figure 12

# DASHEEN

## SEASONAL PRICE VARIATIONS

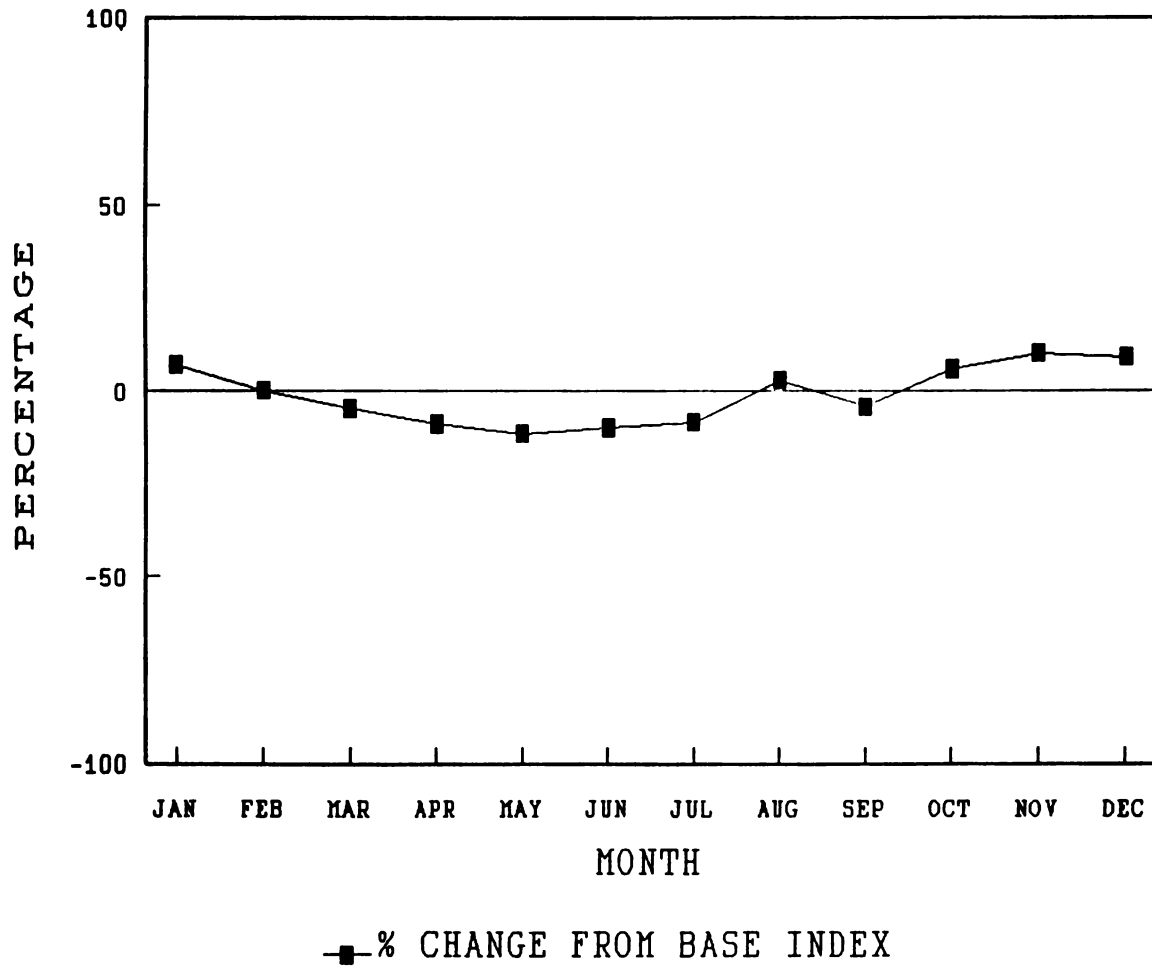


Figure 13

# DRIED GUNGO PEAS

## SEASONAL PRICE VARIATIONS

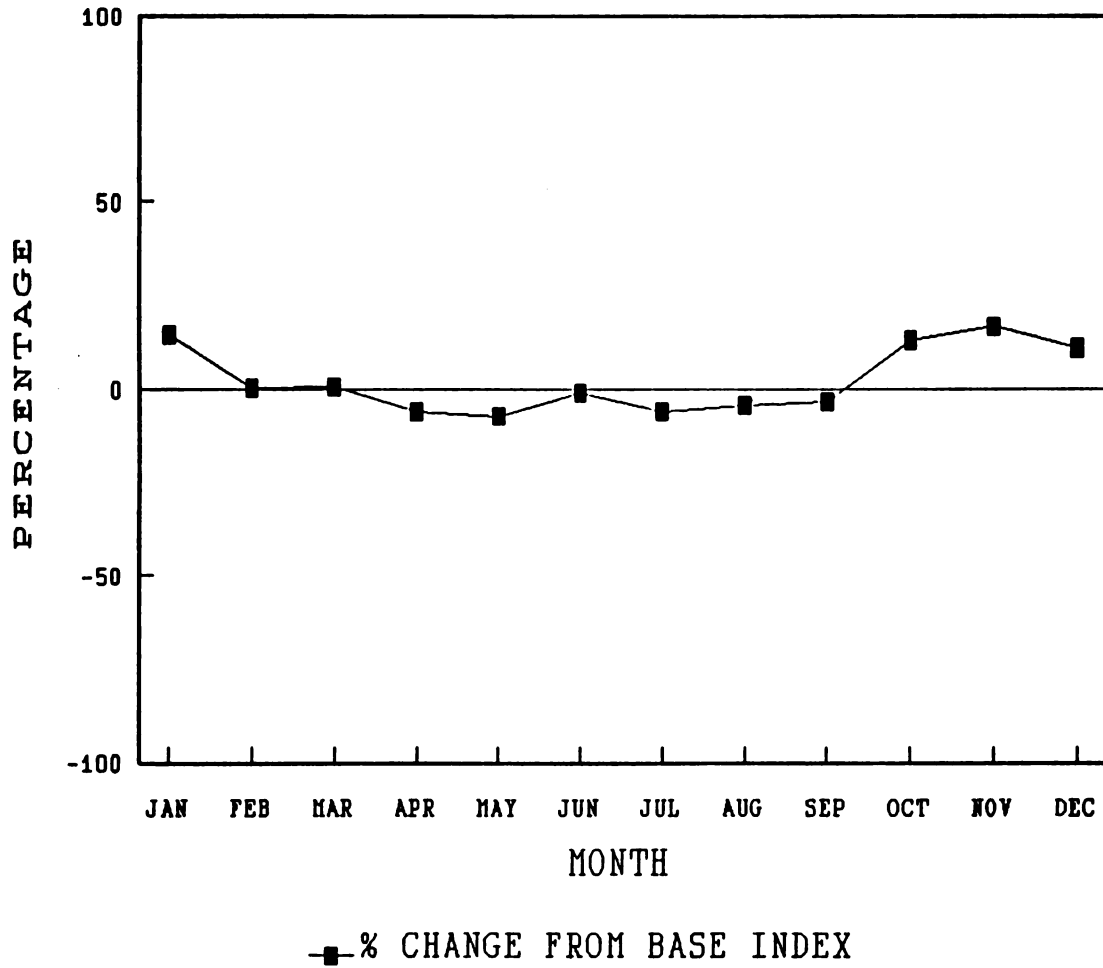


Figure 14

# ESCALLION

## SEASONAL PRICE VARIATIONS

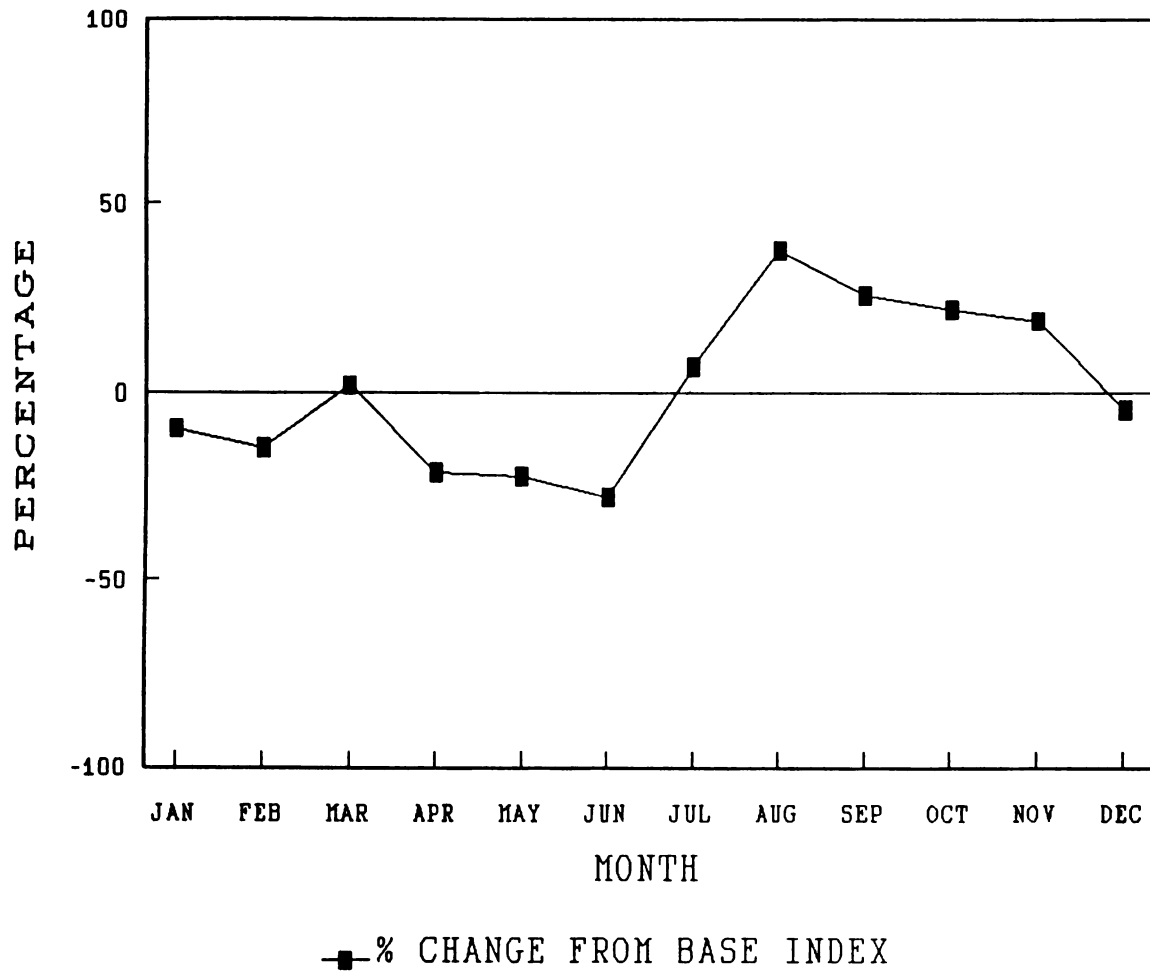


Figure 14

# GRAPEFRUIT

## SEASONAL PRICE VARIATIONS

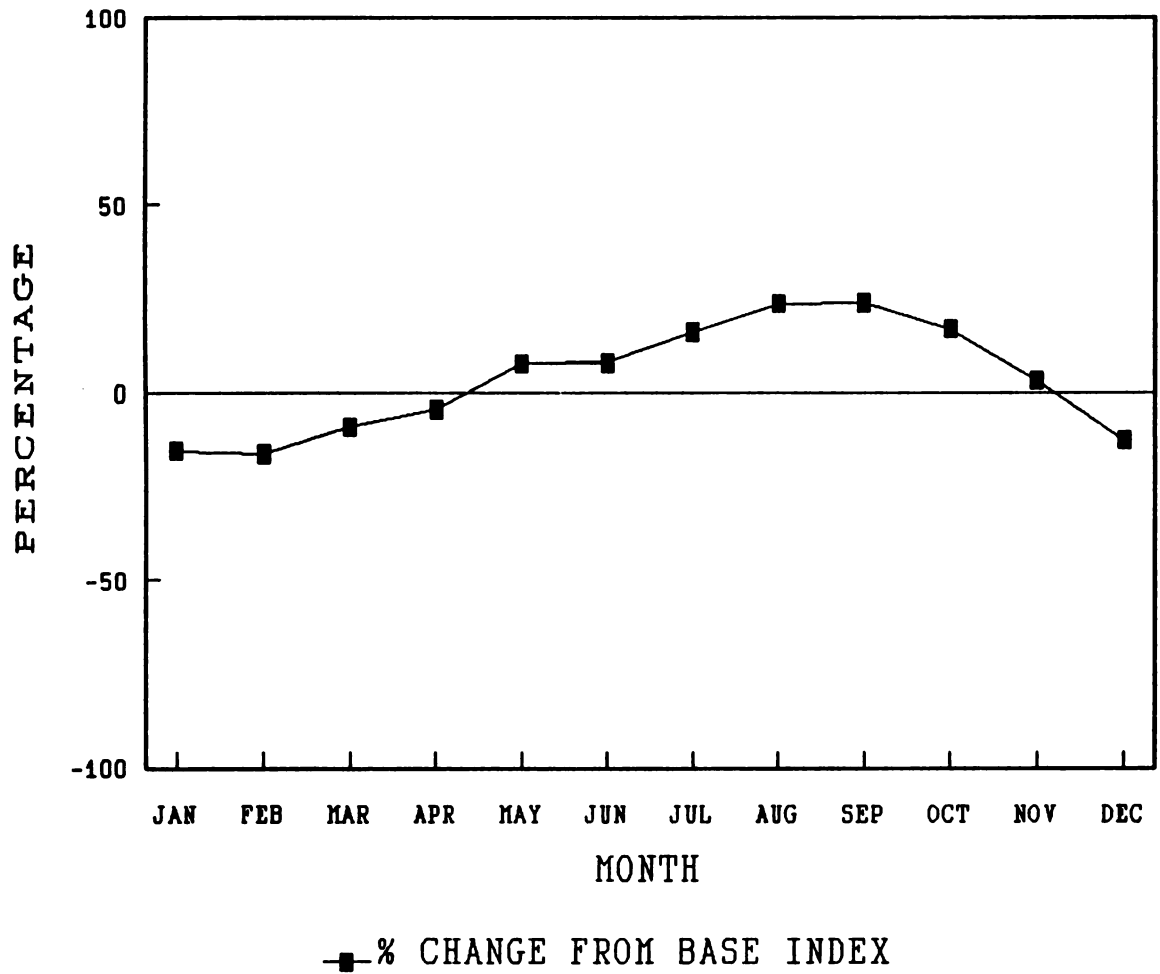


Figure 22

# PUMPKIN

## SEASONAL PRICE VARIATIONS

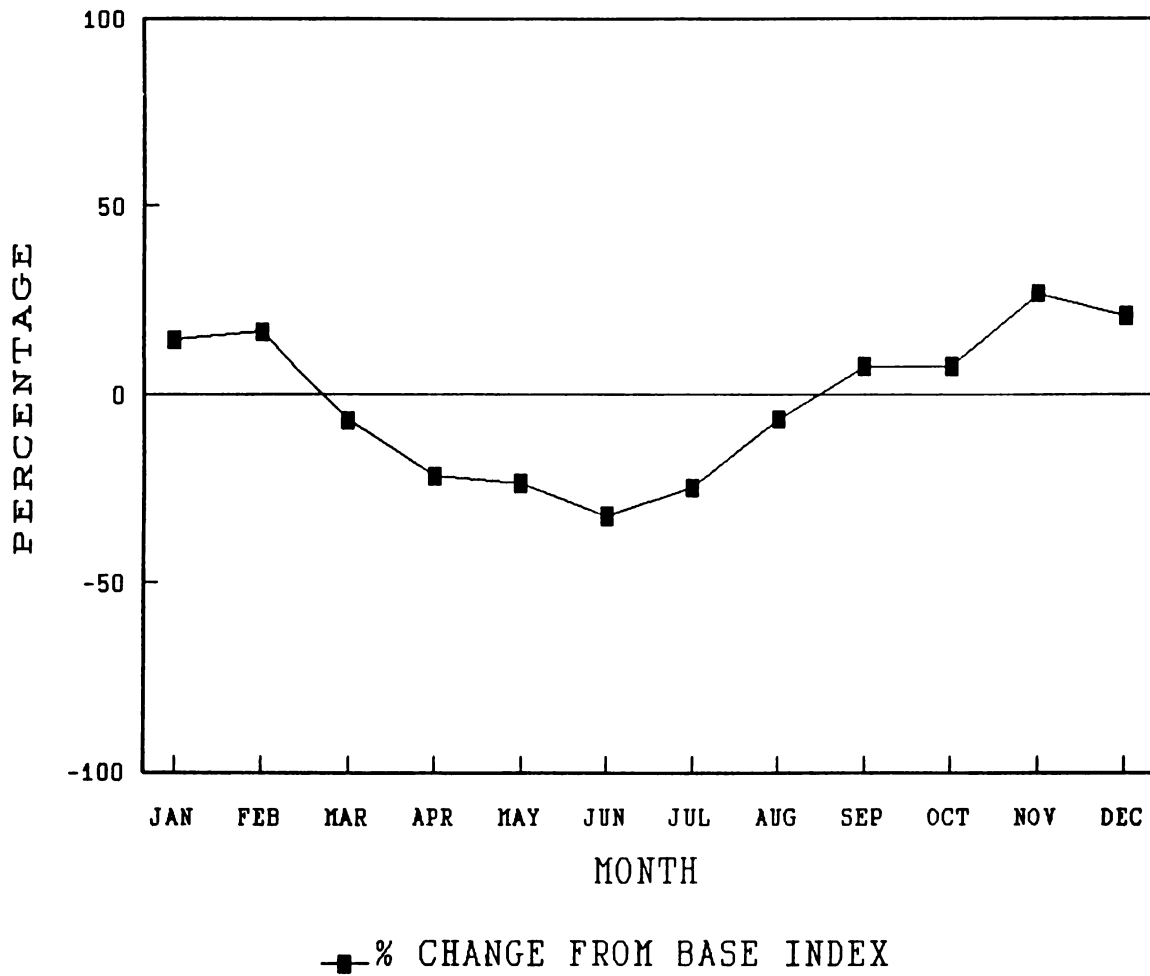


Figure 23

# RED PEAS

## SEASONAL PRICE VARIATIONS

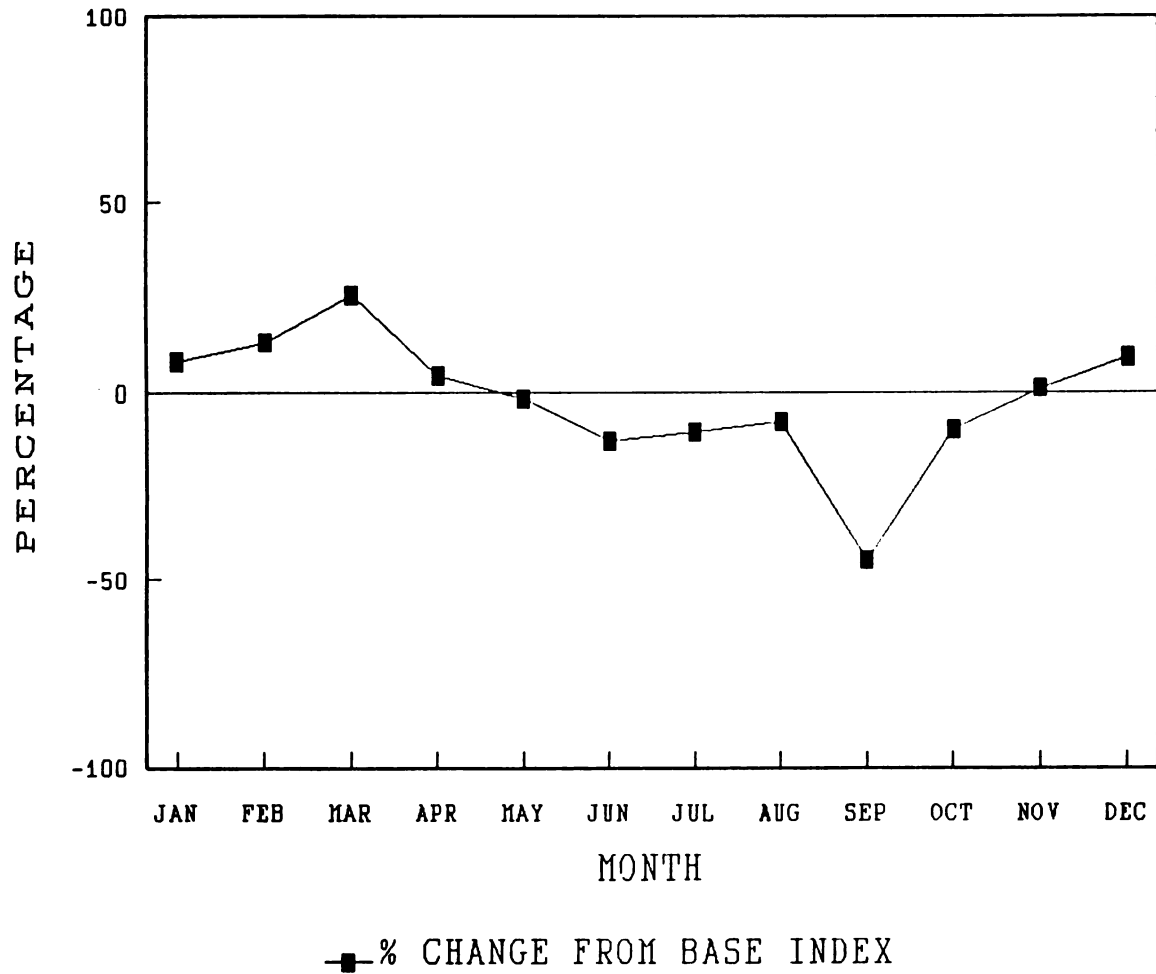


Figure 24

# ROMA TOMATO

## SEASONAL PRICE VARIATIONS

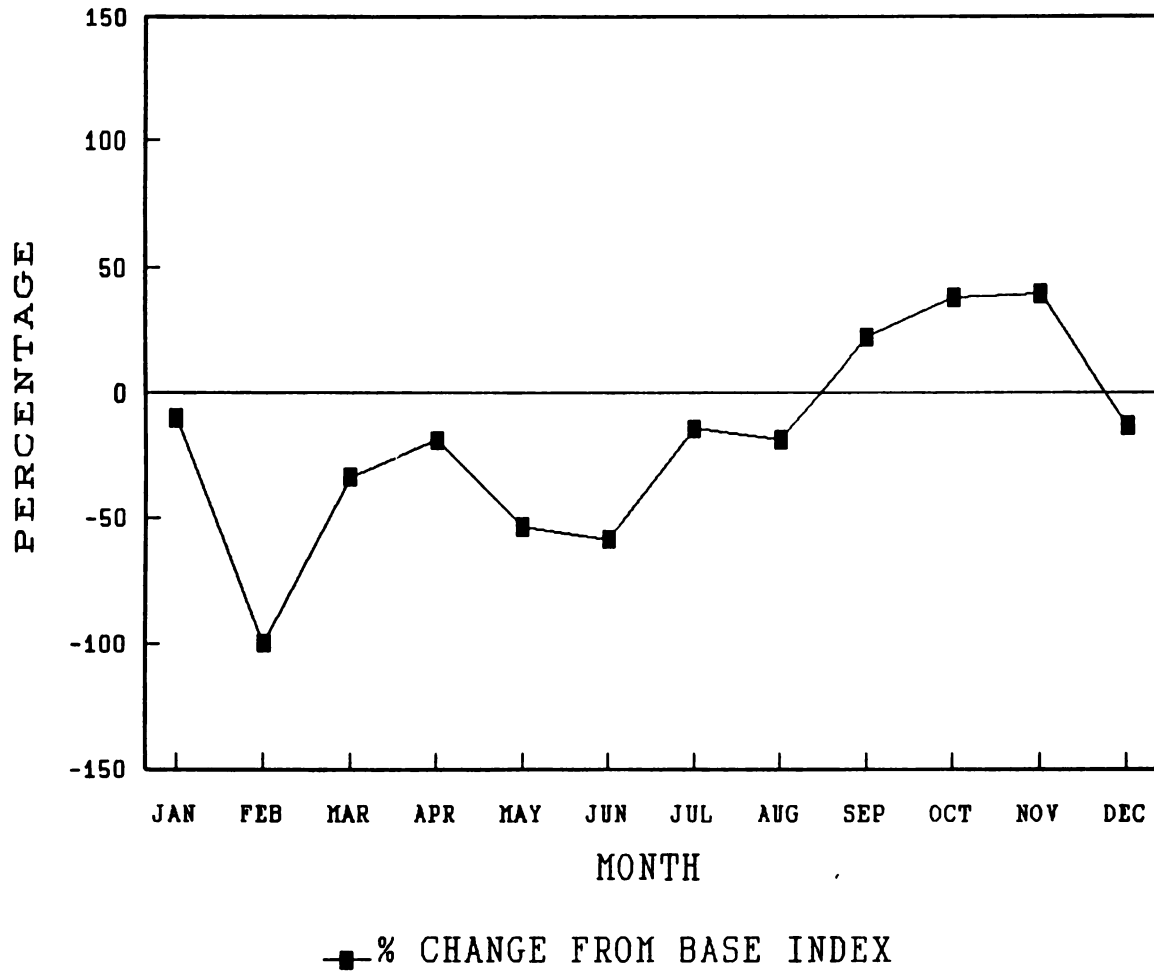




Figure 25

# STRING BEANS

## SEASONAL PRICE VARIATIONS

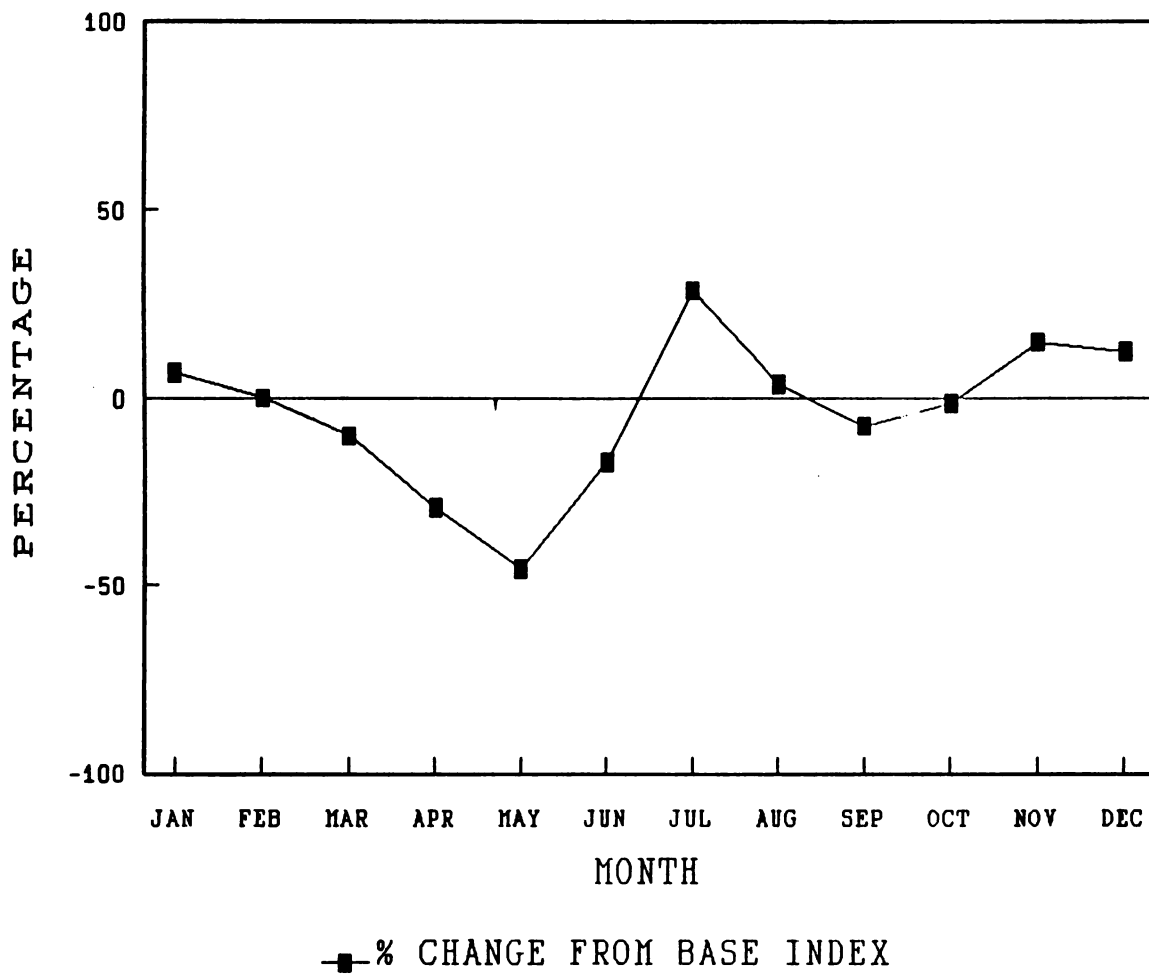


Figure 26

# SWEET PEPPER

## SEASONAL PRICE VARIATIONS

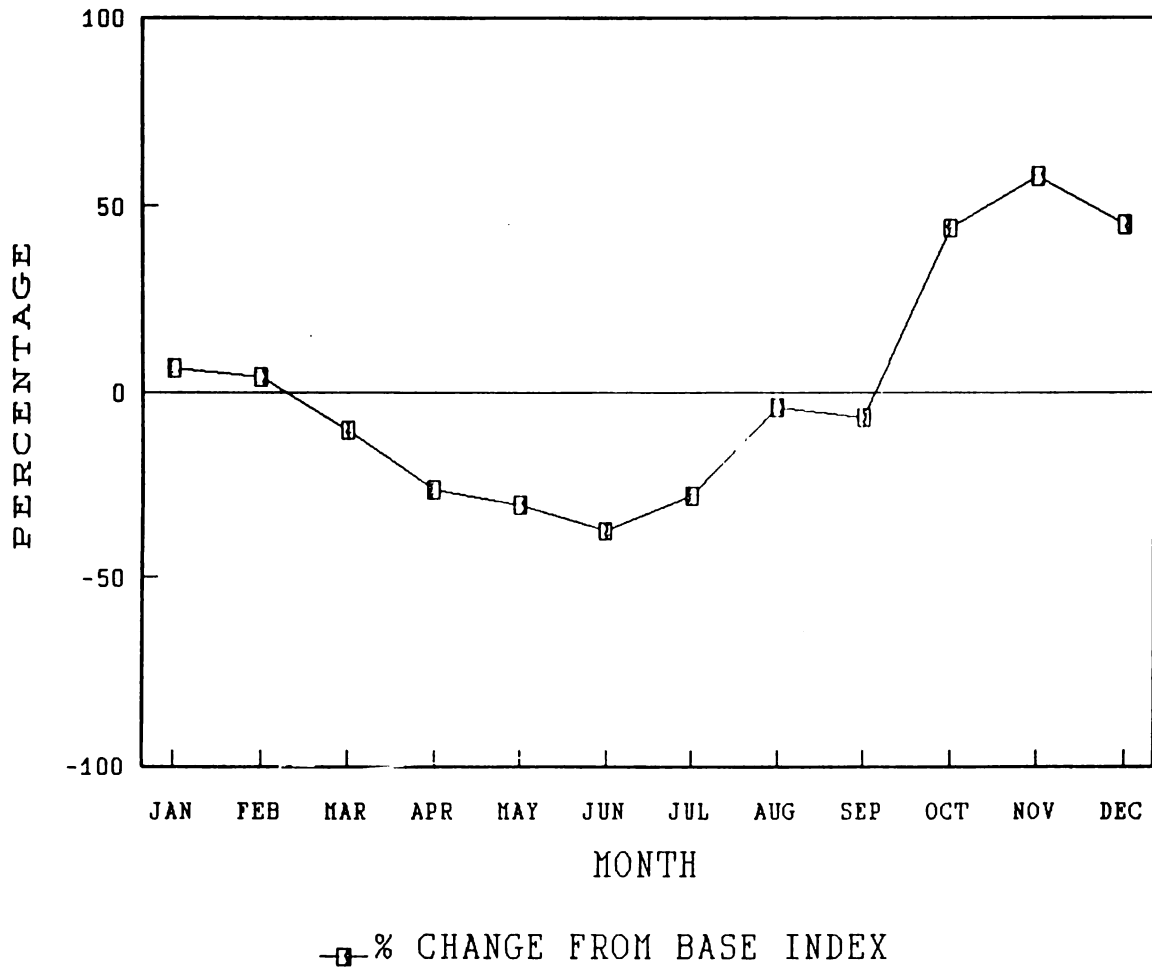


Figure 27

# SWEET POTATO

## SEASONAL PRICE VARIATIONS

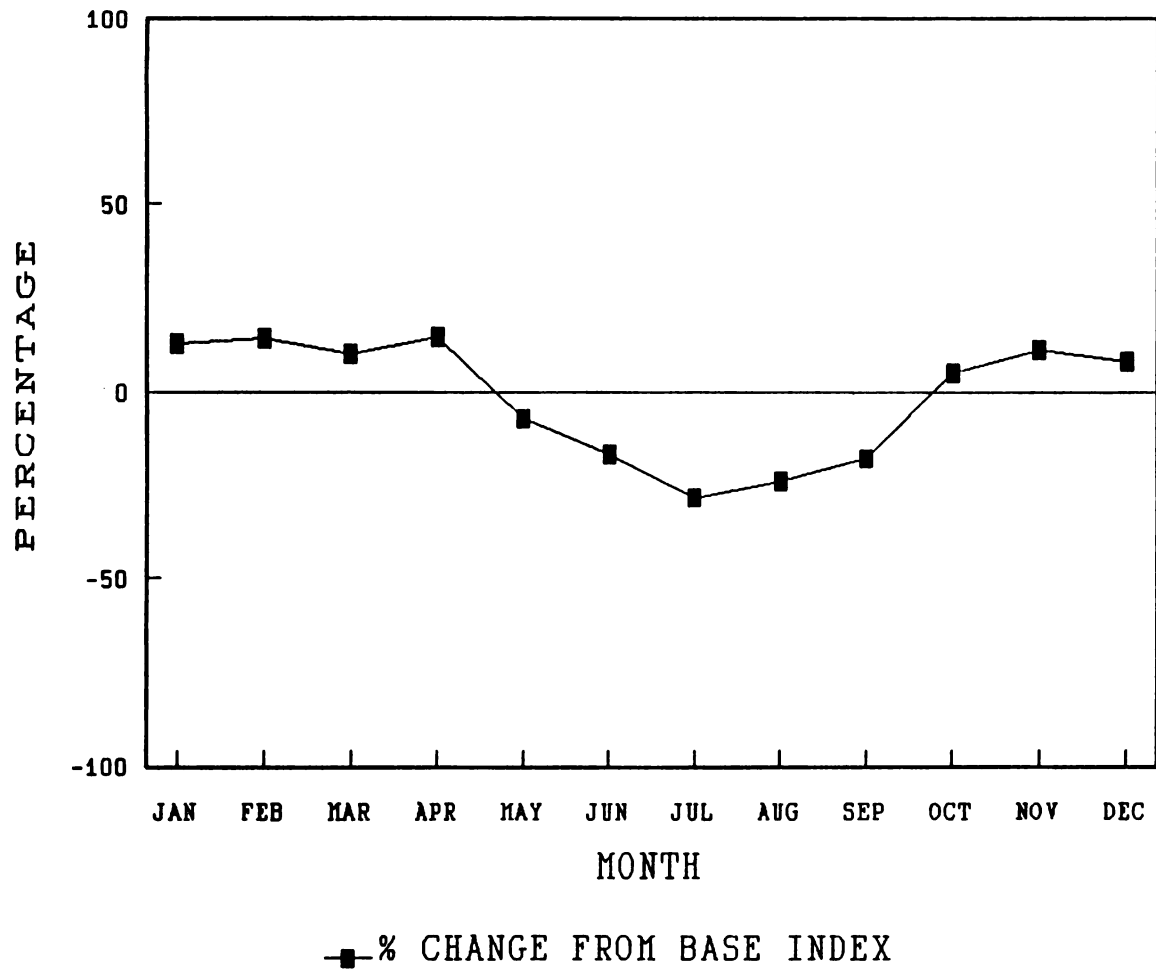
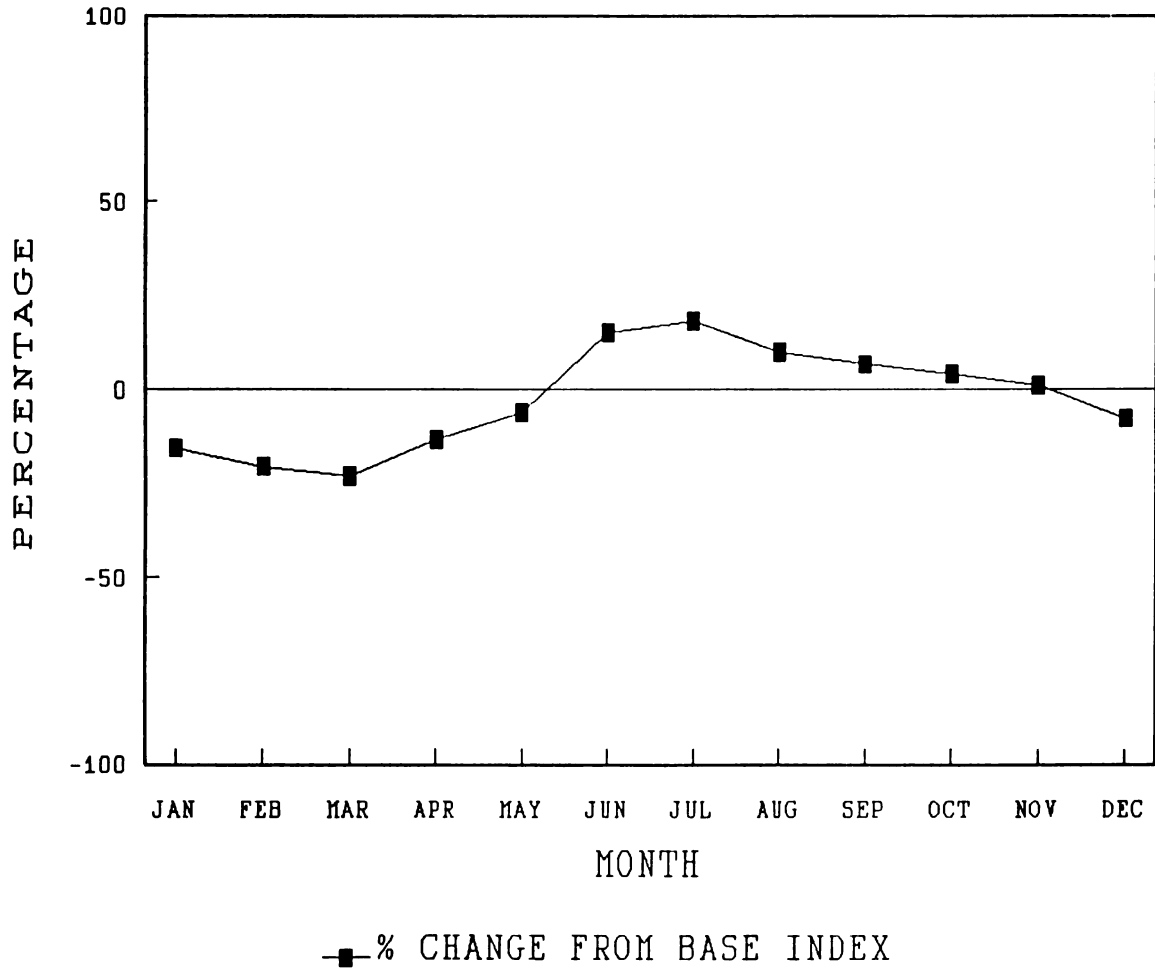


Figure 28

# YELLOW YAM

## SEASONAL PRICE VARIATIONS



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variation for the coronation  
market

Fecha Devolución	Nombre del solicitante







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