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# **To Market, To Market To Sell Fresh Produce; But Where? and When?**

by

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U.S. agriculture has been influenced by significant changes over time and the rate of change in the future promises to accelerate at an even faster pace. Today's agriculture is characterized by decreased farm numbers, increased average farm size, increased specialization, increased use of capital, and more reliance on global market conditions in determining production and marketing strategies.

Kentucky has followed national trends on some variables but differs on several others. Kentucky, for example, is still a state of small farms. About 37 percent of Kentucky's 100,000 farms average less than 50 acres each. In addition, over 80 percent of Kentucky's farms have total farm sales of less than \$40,000 each annually. The gross incomes of 60 percent of Kentucky farms are less than \$10,000 per year (Skees, Vantreese, Reed and Swanson).

While the national trend is towards increased specialization, most Kentucky farms are diversified, producing several crop or livestock products. Tobacco is the principal commodity on 47 percent of Kentucky farms, followed by beef (23%), grain (11%), and dairy products (7%). There are more than 3,000,000 acres of corn,

wheat and soybeans grown in the state each year. Grain crop acreage has recently decreased due to crop prices and government programs.

While tobacco is the principal commodity on 47 percent of all Kentucky farms, Western Kentucky appears to be dominated by grain farms (40%). About 18.5 percent of Western Kentucky farms are classified as tobacco farms, 18.1 percent as beef farms and 3.5 percent as dairy farms (Vantreese, Skees and Reed).

As mentioned above, grain crop acreage has decreased due to crop prices and government programs. This trend, coupled with tobacco's uncertain future and other financial stresses affecting Kentucky agriculture, has prompted farmers in many parts of Kentucky to consider a number of enterprise combinations as alternatives to supplement declining revenue from tobacco and grains. In some instances, farmers are looking to alternative enterprises not as sources of supplemental farm income but as replacements for existing enterprises. While existing data suggests that no single enterprise can compete with tobacco in terms of net returns per acre, there are a number of enterprise alternatives that have the potential of providing supplemental income.

This study focuses on produce marketing with proper management and marketing practices.

Because of geographic location and proximity to markets, many farmers, especially those in Western Kentucky, could enhance their income through expanding the production and marketing of fruits and vegetables on a limited but planned basis. Agricultural census data show 1,537 Kentucky farms selling vegetables in 1982, and average vegetable sales were \$2,835 per farm. Average sales for the 466 Kentucky fruit farms were \$4,742 (Love, Jermolowicz and Stegeline). Because of the trend in per capita consumption of fruits and vegetables, it is felt that opportunities for expanded production in Kentucky do exist.

Although Kentucky is considered to be a minor producer of fruits and vegetables, some income possibilities could be realized through proper production and marketing. For those farmers who have made the decision to allocate resources to fruit and vegetable production, management decisions become those of how best to maximize profits through proper production and marketing of fruit and vegetable crops.

While each farmer reserves the right to make independent decisions relative to resource allocation, it is the summation of such independent decisions that affect the volume of produce available to market channels. Any production decision made because of profit potentials is accompanied by potentials for risks reflected in losses. However, through risk management, the producer chooses production and marketing alternatives that are most consistent with the farmer's profit objectives and willingness and ability to bear risks.

Unlike tobacco and other price support programs where support prices offer some degree of certainty at the time of sale, no such certainty is associated with the sale of vegetable crops. Basically, prices for vegetable crops are determined by supply and demand at the time of sale. Further, the quantity supplied over the growing season is influenced by such variables as weather, markets, insects, diseases, labor and government policy. Therefore, producers' marketing decisions are based on expected prices that vary over the growing season; but the questions still remain of where to market and when to market.

### **Problem Statement**

Western Kentucky farmers involved in vegetable production have several markets available to them, including those produce markets

located in Louisville, Nashville, Asheville, Atlanta, Cincinnati and St. Louis. The marketing period (market window) for these producers has also been fairly well established. Examples of these market windows are graphically portrayed in the University of Kentucky College of Agriculture "Options for Kentucky Farmers" #14-21 (Love, Jermolowicz and Stegeline), which present the high, low and average weekly prices for the recent 14-year and 5-year periods for several vegetables.

To maximize profits during these market windows, farmers need to be in a position to predict potential prices at a specific market at any specified time period during the marketing season. One approach to do this has been to calculate the standard deviations about the average weekly price reported by the wholesale terminal markets to assess the amount of risk incurred at particular markets vis-a-vis the variability in the weekly prices (Hinson and Lanclos). Of course, in order to recognize the profit potential and specific market windows, the budgeted costs of production, including harvesting and post-harvest handling costs, can be overlaid on the average market prices reported (Mook). Risk management allows producers to put risks into meaningful terms of measurement or risk ratings. Risk ratings provide standard measures and standard definitions of optimistic, expected, and pessimistic prices, costs and revenues (Mizelle).

It is posited that Western Kentucky vegetable producers could improve their income situation through improved marketing strategies. Of concern to first-time producers is that the average weekly prices calculated from a time series, i.e., 5-, 7-, 10- or 14-year periods, mask the trends in commodity prices over time as well as obscure the actual variability in prices received at a wholesale market, such that the price range actually observed may be narrower when looking at only one year versus the deviations calculated when following multi-year average prices. Observing actual prices received in a given year at a given market for a given vegetable during a given week allows for much more accuracy in decision making, considering the price risk involved.

With the consumer demand for fresh vegetables being at heightened levels, it is also imperative for fresh produce distributors that product be available for marketing and consumption. For the food service, restaurant and retail grocery outlets serving Kentucky consumers, composite analysis approximates the importance of wholesale produce terminal markets at handling about 83 percent of all the fresh produce prior to it

reaching the consumer (Mansfield). Consequently, Kentucky farmers producing vegetables and performing their own initial marketing use these terminal markets extensively for buying and selling their produce.

### Testable Hypotheses

The study focuses on the following testable hypotheses that are important both to the farmers seeking to market produce profitably and to the food distributors who purchase produce from terminal markets:

1. Price variability (high-low price range) is different among the selected markets and price levels may vary from market to market as reflected in the weekly prices. Knowledge of this added price risk should assist vegetable producers in the selection of markets and the timing of sales.
2. Commodities' prices behave differently. Therefore, price patterns will vary from crop to crop (i.e., green beans to tomatoes, etc.) over the same time period.
3. Price variability has widened over time. The high-low price variation is greater in recent years compared to earlier years.
4. Price patterns have become more obscure in the 1980s relative to the 1970s, in part due to the new interest in commercial vegetable production as an alternative enterprise.

### Data Limitations

During the stages of proposal, conceptualization and development, a database was sought from which farmers and other marketers could make more informed decisions so that farmers could answer a number of questions including: (1) What horticultural crop(s) should I/we plant? (2) Which market should I/we select? and (3) When should the crop(s) be planted? which indirectly answers (4) When should I/we market? These are typical questions that surface when alternative crops are discussed.

The crops included in the study (tomatoes, cabbage, cucumber, bell peppers, snap beans, pole beans, yellow squash and zucchini squash) were selected based on university data that suggests, given the growing season requirements, that these crops can be grown successfully in Western Kentucky. In the data collection and analyses process several limitations surfaced, as follows:

1. For some crops, data was not available for certain years.
2. In some weeks, volume was so low that prices were not reported. Therefore, there are missing observations.
3. Very few terminal produce markets exist within proximity to the study area, and fewer markets publish data. Those markets where published data was available were selected. Ideally, markets such as Memphis, Nashville, Louisville or Indianapolis would have been included. Because of the data constraint, four markets are included: Atlanta, Cincinnati, Western North Carolina (Asheville), and St. Louis. These four market areas did not overlap, were in proximity to Kentucky's transportation network, and they published prices.
4. The Kentucky price data needed to make a determination of which Kentucky products fare best in specific markets was not available in most cases. However, terminal first-handler prices were used with a consideration for transportation costs to obtain a local product value.
5. Prices were not referenced for the various commodity grades and standards, leading to a lack of uniformity of prices quoted with an implied grade and standard. Therefore, while products might meet minimum USDA standards, there could be quality variations within this standard.
6. Regional importance and preference of commodity could vary, resulting in the inability to compare the actual reasons for price differences, i.e., Cincinnati zucchini squash versus Atlanta yellow squash.

### Methodology

For farmers contemplating an alternative enterprise for their crop and/or livestock operation, ultimate concern shifts to the price stability, patterns and levels for the new enterprise. Studies that use average prices from some historical time period mask the price instability within a marketing season as well as hide any year-to-year price level trends. Seasonal price trends can be observed, but the use of five-year weekly average prices, for example, does not allow a farmer to observe what occurs in each year or within a particular week or marketing season for a base point of reference.

Consequently, the naive approach that has received the most praise from the farmers con-

sidering an alternative enterprise has been to present the farmers with a visual portfolio for their marketing season. The marketing concerns of where, when and what to market can be graphically or visually portrayed.

Although daily prices are available for many vegetable crops marketed at various wholesale produce terminals, knowledge of the price and market behavior for a given week is necessary to assess whether a specific vegetable should be targeted for sale in that market in a particular week. By scheduling planting or transplanting, a producer can target a market window. Within a specified marketing week, price patterns may exist in a particular market such that once a crop, market and week-to-market have been selected, a grower-marketer may well determine what day of the week to market for better profitability, but a micro-analysis on a daily basis is beyond the purview of this study.

Because price rations supply for perishable commodities and the terminal produce markets are located in various plant hardiness zones, locally provided volume or supply at a market would be different during a specified week due to local product maturation and supply varying among the markets. Prices for the crops would also be different because of the supply quantities locally marketed. The absolute vegetable prices (high and low) reported each week at a market for a given commodity defies the price range over which prices varied in that week. Large volumes of a specific perishable tend to depress the market price for that crop as price is the consumer incentive to either clear or equilibrate supply with demand. Variations in grade of marketable produce on the market tend to increase the price variability reported in the published data. The commercial expertise of local produce marketers (local relative to the market site), or lack thereof, may also influence the price ranges reported, although price variability does not characterize a market's instability nor the professionalism of its patrons. However, if price patterns are known, including the variability and trends within a marketing week and a market season, commercial growers can select a market and plan the timing of harvest and sales, and the timing for planting or transplanting.

Merely reviewing prices does not assure profitability in the commercial vegetable industry nor profits from raising and marketing a specific vegetable crop. Production budgets or cost data should be tied to the prices reported by a terminal market to determine if positive net returns are obtainable. These costs should include variable production expenses, the fixed and overhead

costs chargeable to the enterprise, the harvesting and post-harvest activity expenses, and the shipping and handling costs from the shipping point to the market and the return trip costs, if applicable.

The transportation network and the specialized transport equipment for handling perishable vegetable crops have made many terminal produce markets suitable sites for Western Kentucky farmers. Calculated transportation costs from a shipping point to these terminal markets allows a farmer to compare the prices received by growers in a market to the transportation and marketing expenses associated with delivering to that market. Consequently, a nearby market reporting a lower price than a more distant market may actually net the grower a higher return because of the transportation costs attributed to delivery at the farther market. This does not mean nearby markets unequivocally return high net revenues to growers than do faraway markets; much higher prices at the distant market may compensate the grower-marketer for the extra miles to deliver to that market.

Given the aforementioned background and possibilities for marketing vegetables by Western Kentucky farmers, the methodology employed is to graphically review the high-low price ranges reported for the 27th through the 39th week of the calendar years 1970 through 1987 for the principal vegetable and fruit crops for the Western Kentucky region. The 27th-39th weeks (approximately July 1 through October 1) correspond to the marketing season attainable with spring vegetable crops grown in the study region. The fresh market vegetable crops scrutinized include snap beans, pole beans, cabbage, cucumbers, bell peppers, yellow squash, zucchini squash and tomatoes. The produce terminals from which price data was obtained were the four active markets of St. Louis, MO, Cincinnati, OH, Asheville, NC and Atlanta, GA. Apples are the one fruit crop analyzed in the study among the four markets, but the apple market season reviewed was for the 35th through the 48th week (about September 1 through December 1).

## Observations

The first phase of the analysis was to ascertain if there had been any persistent trends in prices for the various crops over time in the four markets. The second phase of the study used production and transportation costs in conjunction with the market prices to determine if there were periods when Western Kentucky pro-

ducers could profitably ship to any of the four markets studied.

Atlanta is the largest of the four markets studied. Prices in this market show a consistent upward bias over time for snap beans, pole beans, bell peppers and yellow squash. Prices for tomatoes in Atlanta have increased during the 1980s, but they seem to have leveled off during the last few years. Bell pepper prices have shown a marked tendency to peak at the time when Western Kentucky product would first hit the market, early July.

The Cincinnati market is dominated by a few large family-owned businesses with a few smaller firms providing specialty packs and other marketing functions. Snap and pole bean prices have more than doubled since the 1970s in Cincinnati and they have exhibited a consistent bimodal seasonal price pattern. Additionally, in this market, within-week price variability was minimal for these two commodities. Cucumber and bell pepper prices have shown a marked price improvement over the past ten years in Cincinnati. Zucchini squash prices have also increased over time and they have shown a persistent improvement within season during August and September each year.

The St. Louis market is known as a major repacking and transshipment location. Snap bean prices have increased over time in this market and they have shown a strong tendency toward increasing within season price variability. Cabbage prices were also very erratic within season and generally declined after making a high in early July. Cucumber prices in this market have risen very gradually over time and they have shown a consistent mid-season weakness in the seasonal price pattern. Bell pepper prices have increased significantly since the early 1970s. Seasonal price lows are typically set during late August or early September and within-week price variability can be quite high. Yellow squash prices have been fairly stable over time and within season in this market. Zucchini squash prices have increased more than ten times during the observed data set. As would be expected, tomato prices are weakest during late July in the St. Louis market. Tomato prices in this market have been quite volatile with as much as \$4.00 per carton within-week price variation.

The Asheville market is supplied by many local growers at a farmers' market and by southern-based shippers. The market demand is strongly influenced by the heavy tourist based economy of the area. The cabbage market has been very stable both over time and within sea-

son in this market area. In contrast, this market has exhibited significant within season price variation for cucumbers. Bell peppers have become a full season crop in this market and season prices have trended upward some three times over the past fifteen years. Tomato prices in this market have increased moderately over time. This has been an expanding market that now exhibits greater price variability both within season and from one season to the next than was the case in the decade of the 1970s. This increased price variability makes the timing of profitable sales to this market quite difficult.

A second phase of this study was to compare prices for the commodities among the four markets during the 1980s, emphasizing 1980 and 1985. The commodities chosen for the cross-market price comparison were cabbage, cucumbers, bell peppers and tomatoes. The other commodities were not included in this analysis because of a lack of consistency in the data set.

Atlanta was the highest priced market for cabbages during 1980 and Cincinnati was the best market in 1985. Asheville had the lowest cabbage prices during 1980 while St. Louis was the lowest priced market during 1984. Cincinnati had the least definable seasonal price pattern of the four markets studied.

Atlanta and St. Louis offered the best early season prices for cucumbers among the four markets. However, the Cincinnati and Asheville markets recorded more stable seasonal prices. This suggests that Western Kentucky growers might wish to split their marketings among the markets as the season progresses.

The main conclusion for bell peppers is that Atlanta normally has the highest prices, especially for the weeks when Kentucky producers would be harvesting. Within-week and within-season price variability, however, was high and timely marketing would be required.

Tomato prices were suppressed in all four markets during late July, due to the home grown garden supply, and late August-early September, due to the commercial growers' fall crop. The Asheville market consistently reported the weakest prices among the four markets for tomatoes.

The final phase of this analysis is to use budgeted cost data and transportation data in conjunction with the market price data to ascertain when, if at any time, Kentucky growers could expect to market to any of the four markets at a profitable level. This analysis was performed on the 1985 price data in the four mar-

kets for cabbage, bell peppers, cucumbers and tomatoes.

Prices above the calculated breakeven for cabbage production and shipping to the markets occurred in late summer in Atlanta, throughout the season in Cincinnati, and early and late season at St. Louis. The Asheville market did not produce prices high enough to offer realistic profit opportunities for Western Kentucky cabbage production at average yield levels.

Profitable marketing opportunities were abundant for Western Kentucky production of cucumbers during 1985 at all of the markets analyzed except St. Louis. There was a brief market window in the St. Louis market during the early season.

All four markets consistently offered prices throughout the season above the calculated breakeven production and transportation cost total for Western Kentucky production of bell peppers in 1985.

St. Louis was the only market to provide a profitable market window to Western Kentucky tomato production during 1985. The other three markets offered prices very close to breakeven, but these markets exhibited a lot of price variability, even within the week, and it would have been difficult to catch the better prices.

Results from an analysis of apple price data in the four markets indicate that the Asheville market is the most risky as prices seem to be unduly influenced by the supply of non-local apples. Prices in the other markets have been fairly stable over time with only a slight increase. The Cincinnati market had the highest price of the four markets and all of the markets exhibited price weakness to some degree during the fall harvest.

This study indicates that the production of selected vegetables and apples can be a profitable enterprise in Western Kentucky agriculture. However, market and production risk are both quite high. If producers obtain proper production and marketing skills, it is likely that these enterprises can be profitably added to the farm enterprise mix.

For the food distributors, this study indicates when product can be acquired at a relative bargain within season in a particular terminal market. Conversely, when produce prices are highest, the food distributors would wisely seek out producers directly for product, so as to avoid

paying middleman charges associated with the wholesaling operations at the terminal markets.

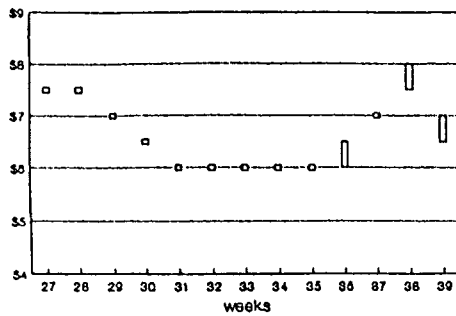
## References

- Hinson Roger and Kent Lanclos. *Wholesale Market Opportunities for Louisiana Produce: Snap Beans, Sweet Corn, Irish Potatoes and Sweet Potatoes* (A.E.A. Information Series No. 66); *Cucumbers, Yellow Squash, Bell Peppers, Tomatoes and Watermelons* (A.E.A. Information Series No. 67), Louisiana Agricultural Experiment Station, Department of Agricultural Economics and Agribusiness, Louisiana State University Agricultural Center, April 1988.
- Love, Harold G., Andrew Jermolowicz and Forrest E. Stegelin. *Options for Kentucky Farmers*, Nos. 14-21, University of Kentucky College of Agriculture Cooperative Extension Service, December 1985.
- Mizelle, William. *Vegetable Economics--A Planning Guide for 1987. Part B: Cost and Risk Rated Returns*, University of Georgia Cooperative Extension Service, Department of Extension Agricultural Economics, December 1986.
- Mook, Richard. "Applications of Market Window Analysis: An Example," *Analyzing the Potential for Alternative Fruit and Vegetable Crop Production Seminar*, S-178 Technical Committee and Farm Foundation, New Orleans, Louisiana, November 4, 1985.
- Shurley, Don and Forrest Stegelin. "Analyzing Your Opportunities for Alternative Enterprises: *Agribusiness News for Kentucky*, Department of Agricultural Economics, University of Kentucky, No. 56, June-July 1988.
- Skees, Jerry R., Valerie L. Vantreese, Michael R. Reed and Louis E. Swanson. "Kentucky Farm Change," *Kentucky Agribusiness News*, University of Kentucky Department of Agricultural Economics, No. 50, October 1987.
- Stegelin, Forrest. *Evaluating Market Opportunities for Alternative Enterprises*, Department of Agricultural Economics, University of Kentucky, Staff Paper #242, May 1988.

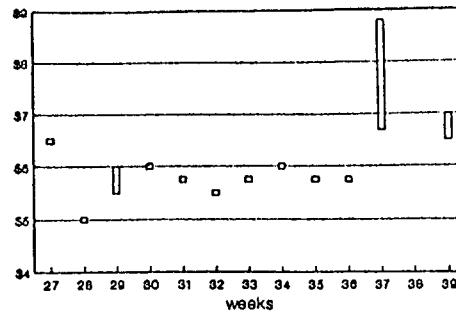
Vantreese, Valerie, Jerry R. Skees and Michael R. Reed. *Farm Debt in Kentucky*, Special Extension Series, Department of Agricultural Economics, University of Kentucky, August 1988.



ATLANTA

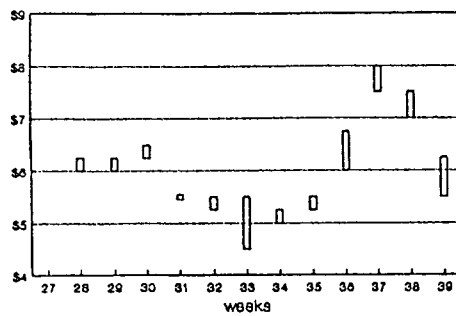


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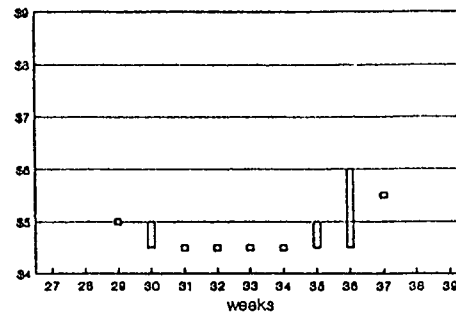


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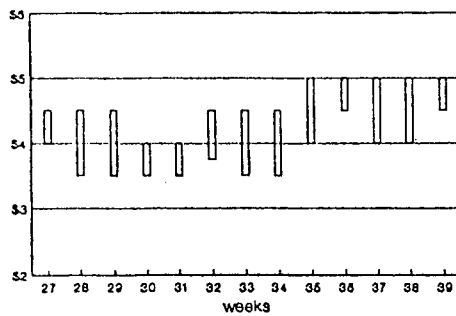
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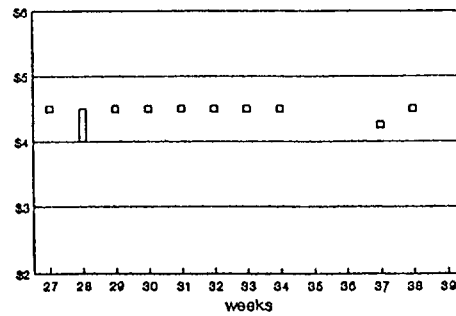
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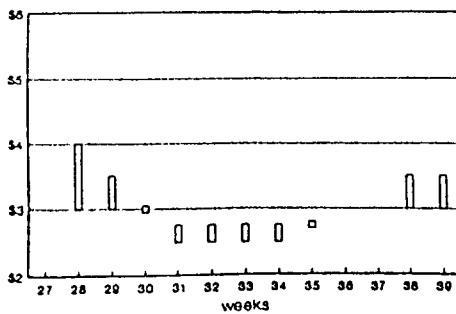


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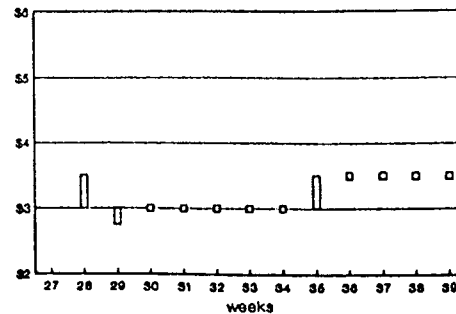


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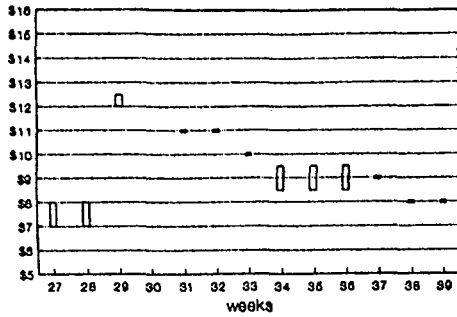
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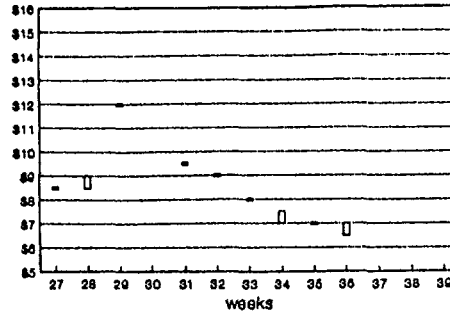
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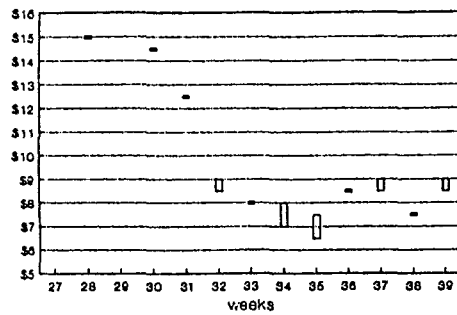


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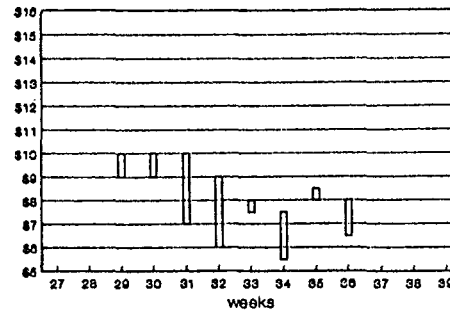


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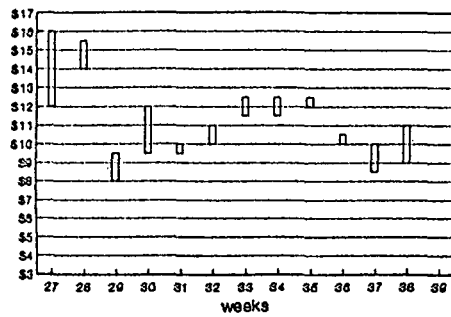
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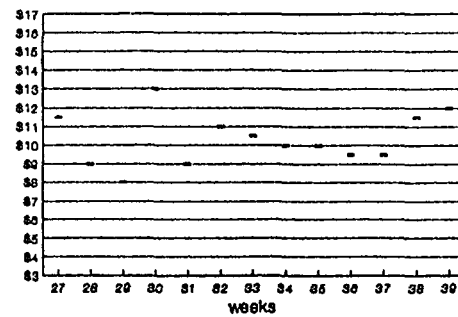
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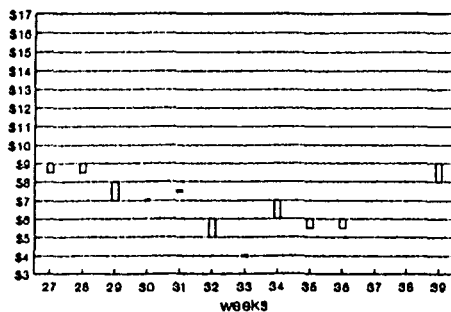


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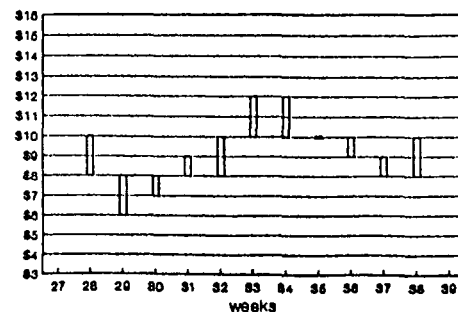


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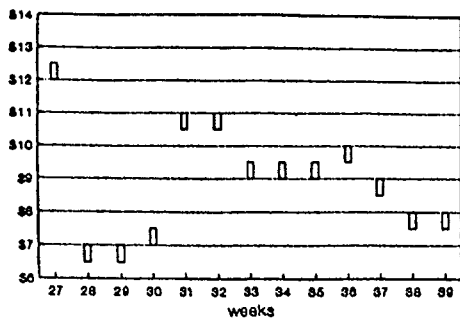
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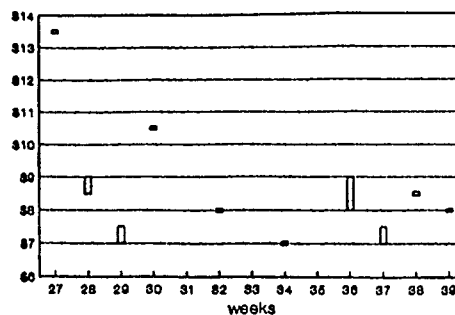
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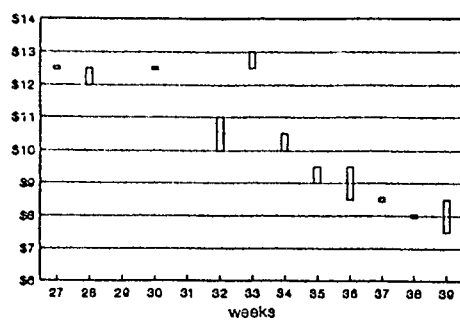


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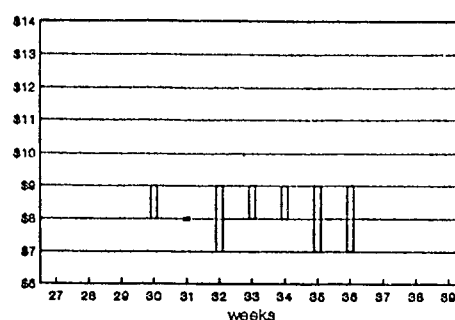


## 1980 BELL PEPPER PRICES

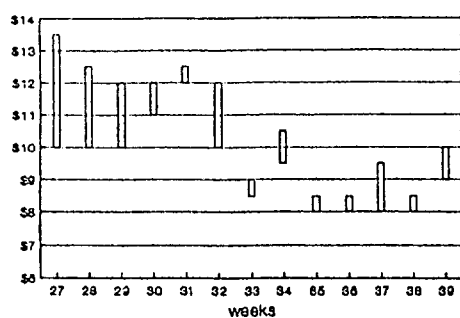
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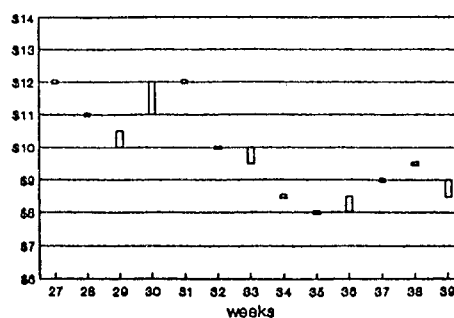
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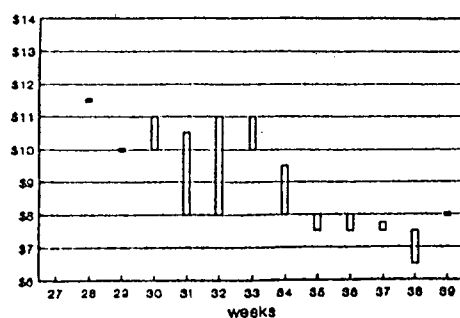


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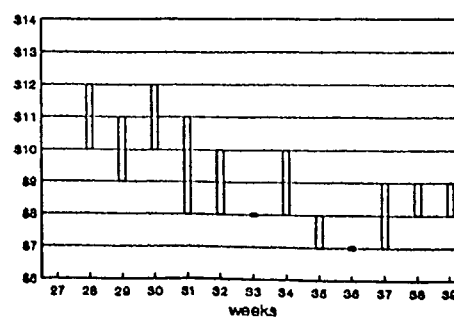


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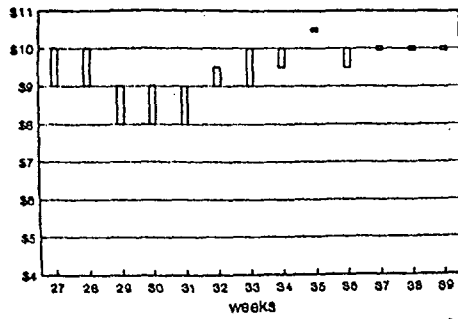
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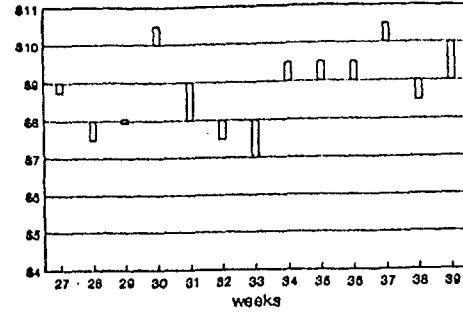
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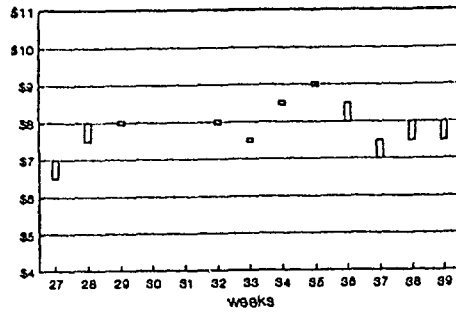


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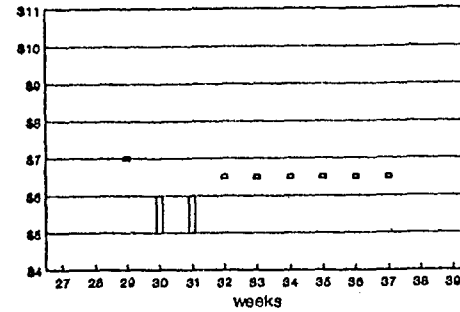


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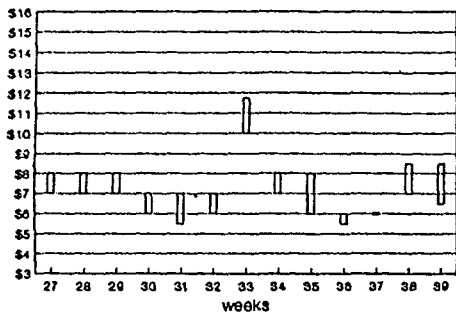
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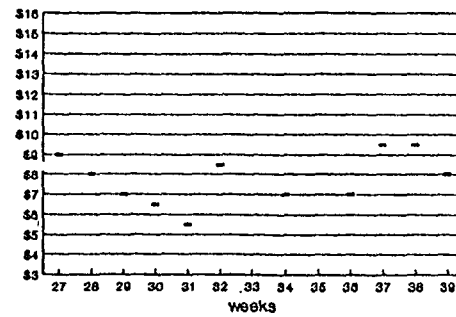
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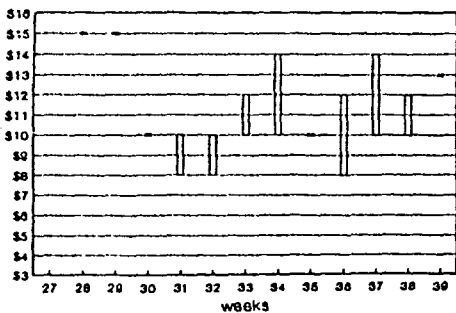


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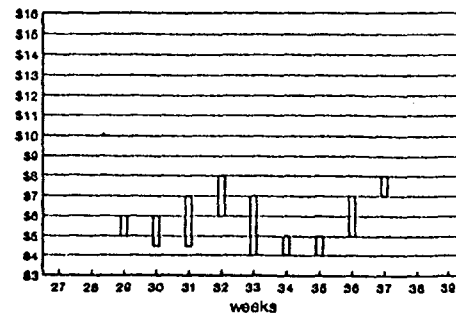


## 1985 TOMATO PRICES

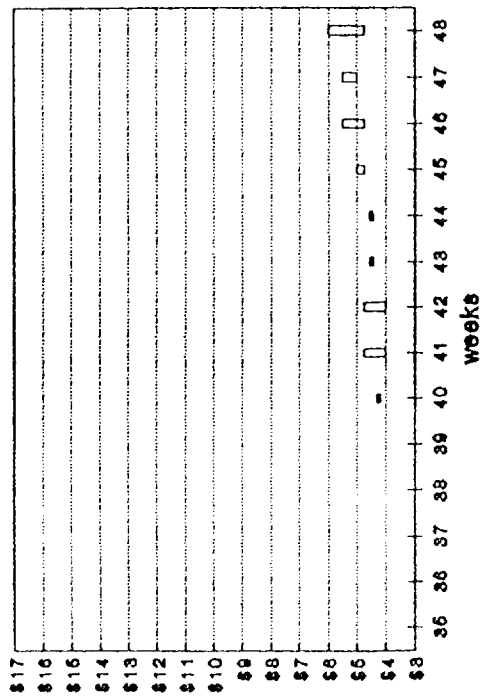
ST LOUIS



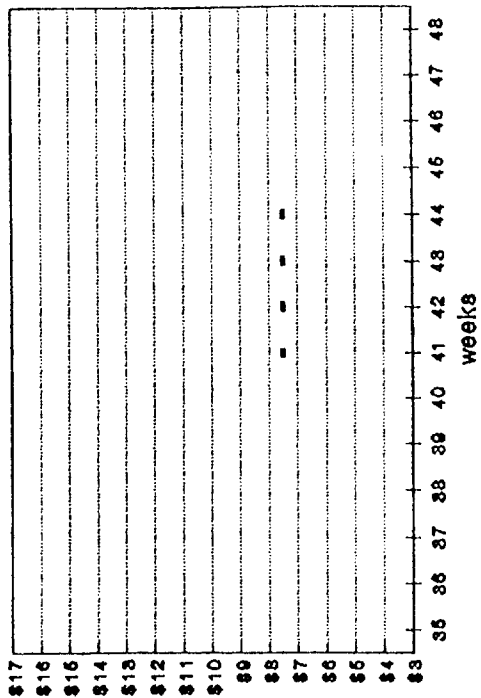
WESTERN NORTH CAROLINA



1970

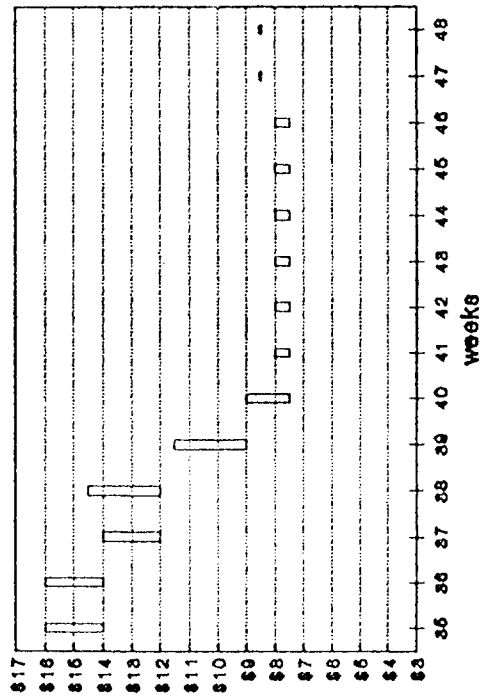


1975

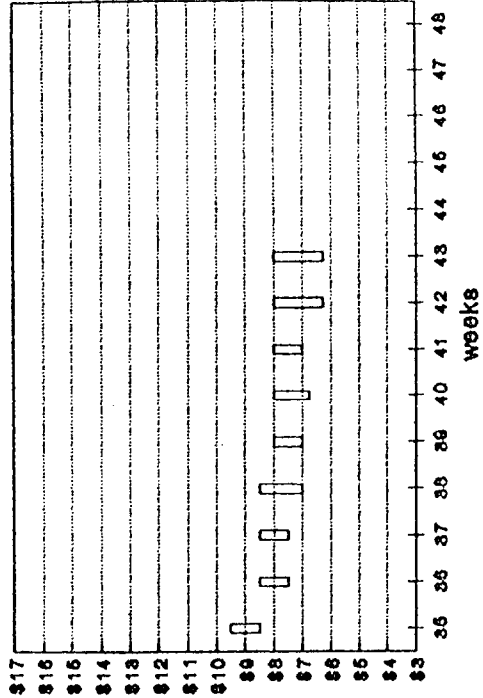


# ATLANTA APPLE PRICES

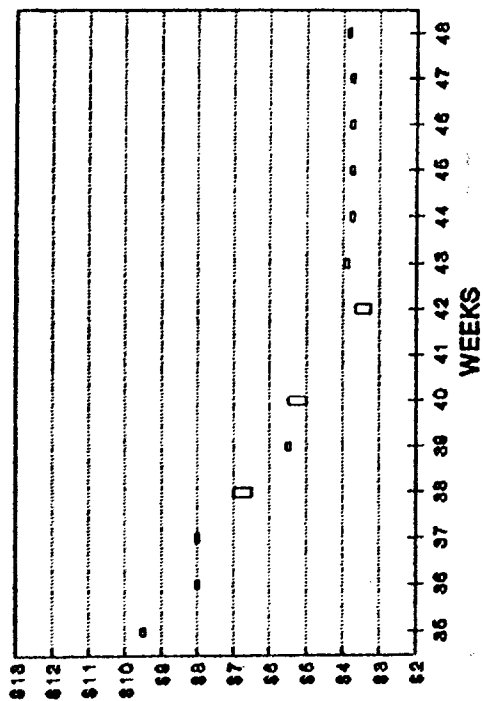
1980



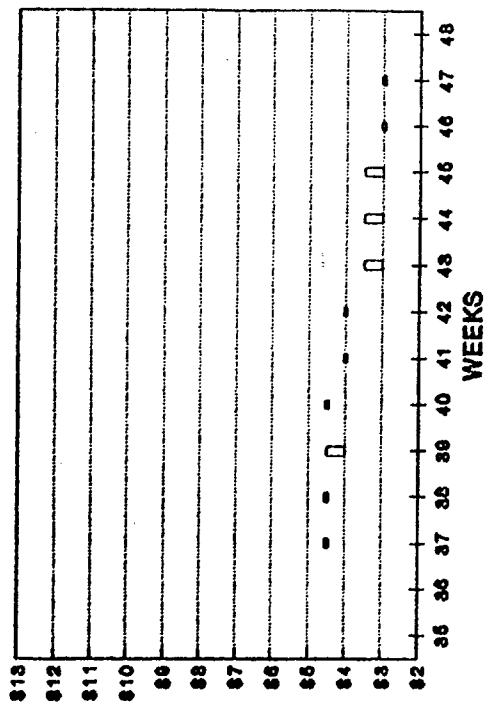
1985



1970

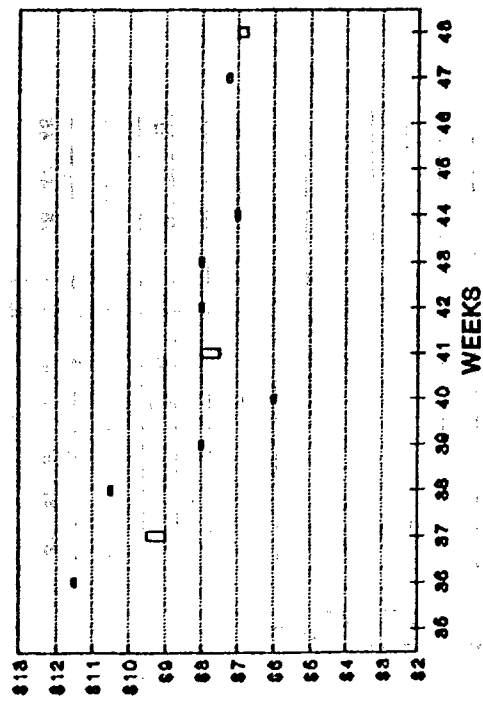


1975

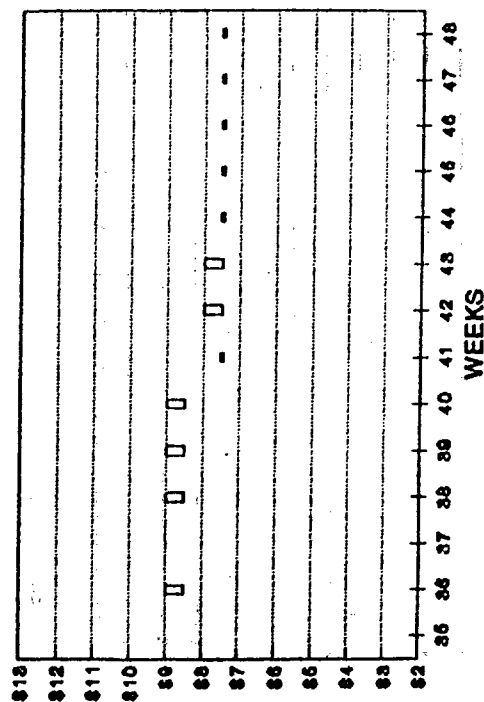


# CINCINNATI APPLE PRICES

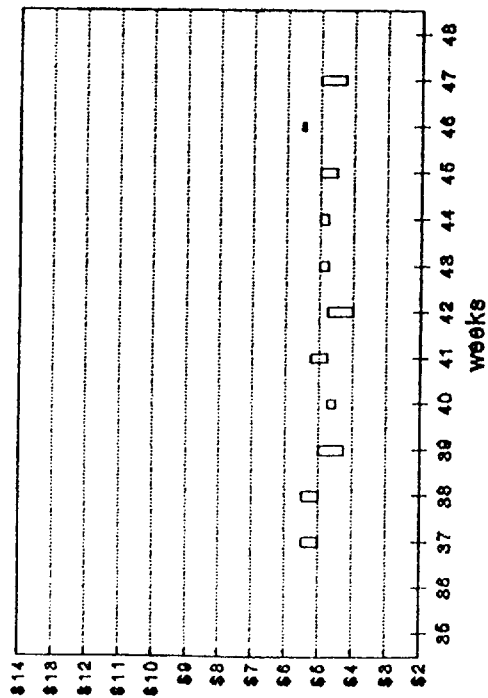
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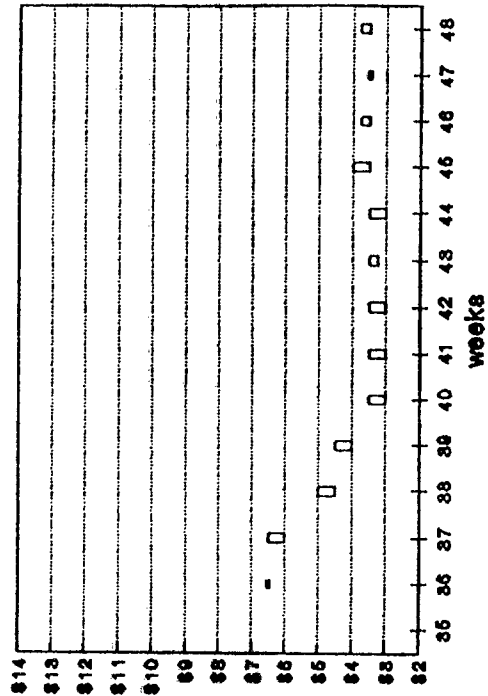
1985



1970

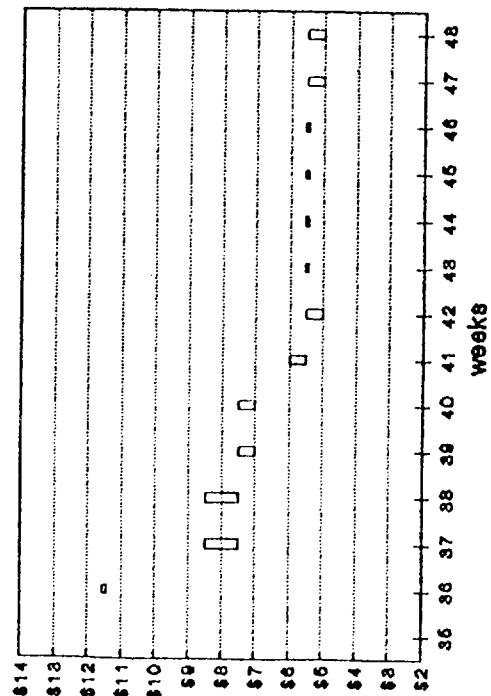


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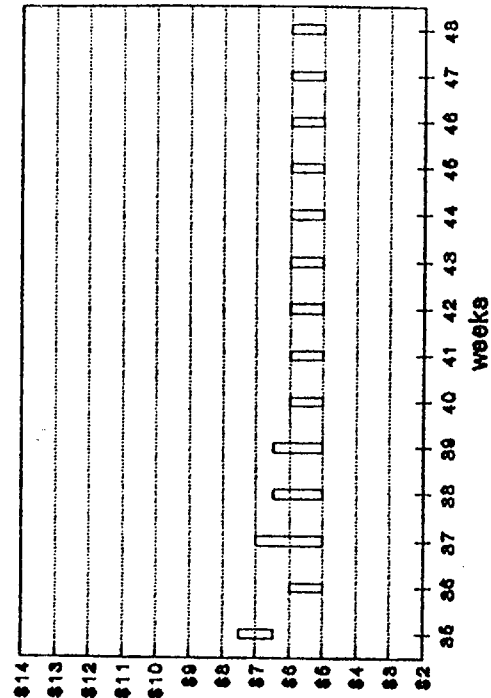


# St LOUIS APPLE PRICES

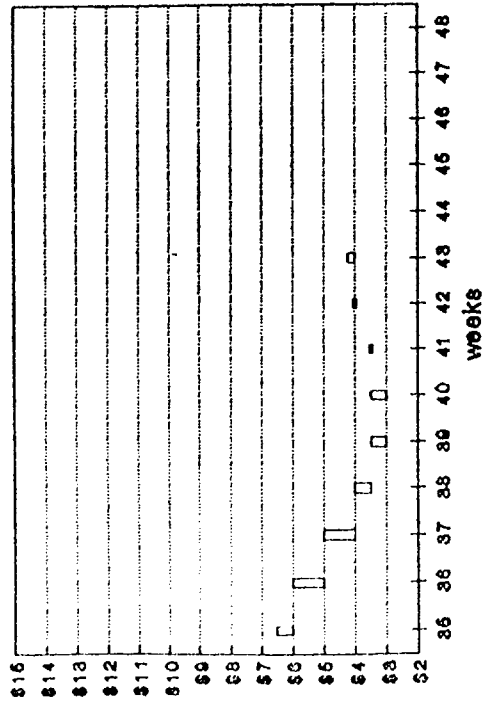
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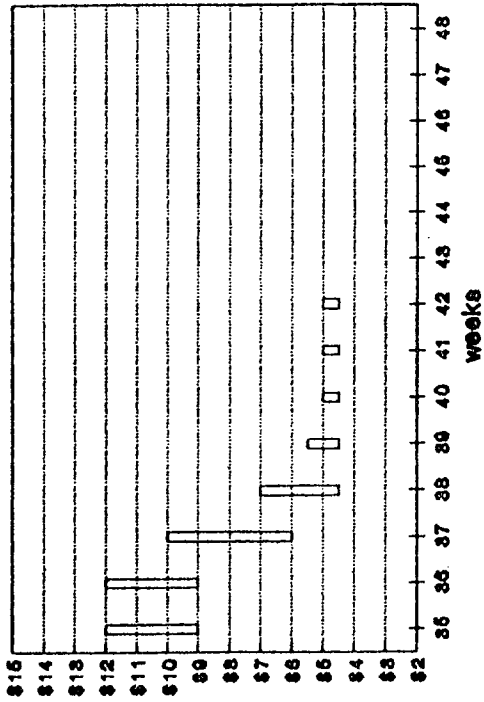
1985



1970

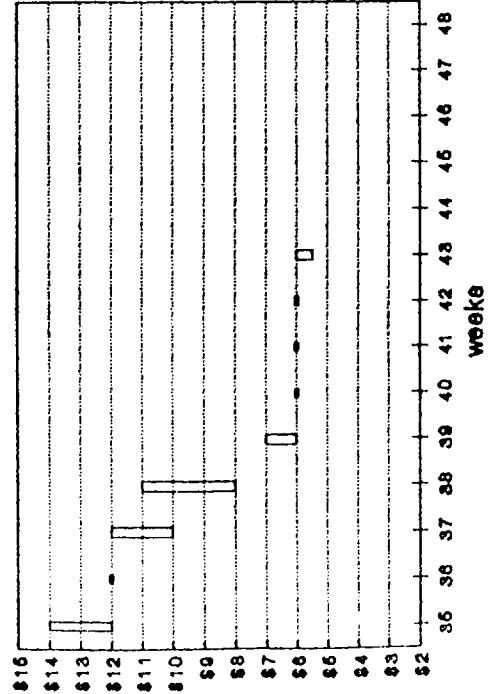


1975



# W. N. C. APPLE PRICES

1980



1985

