A SUMMARY ANALYSIS OF IN-STORE ONION PROMOTION TESTS AND TEST SHIPMENTS OF PRE-PACKAGED SOUTH TEXAS ONIONS

A Report to the
South Texas Onion Committee,
A Federal Market-Order Program
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From the
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THE TEXAS AGRICULTURAL MARKET RESEARCH AND DEVELOPMENT CENTER

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PART I

OVERVIEW OF SOUTH TEXAS ONION PRODUCTION AND MARKETING

Production of onions in South Texas has been quite variable over the last several years. Compared with a crop of slightly over 3 million sacks, 50 lb. equivalent basis, in 1966, about 7.6 million sacks were produced in 1964 and 1967. Variability comes from two sources--acreage planted, ranging from 16 to 33 thousand per year and fluctuating yields which reflect weather and other growing conditions. The year to year changes in production and resultant prices are presented in a histogram graph, Figure 1. With the single exception of 1963, every time that production has changed, the price received by growers has moved in the opposite direction, Figure 1 and Table 1. The interaction between the quantity of onions produced and the price received by growers is shown in a more positive form in the graph, Figure 2.

Onion production in South Texas enjoys two distinct advantages. No other United States area is in production at the time the product comes to market. Some suppliers are available from Mexico. Competition, therefore, primarily is in the form of storage onions from other U.S. production areas. Also South Texas onions are of a very mild flavor which distinctly differentiates them from competing varieties. With these two

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* This report summarizes research projects conducted by W. Bernard Lester, Gordon Powell, Carl Shafer and Robert E. Branson. The research was previously reported by phases in Texas Agricultural Experiment Station Progress Reports 2309 (April 27, 1964) and 2384 (December 22, 1965).

FIGURE 1. Early Spring Texas Onion Production and Price, by Years 1958-69

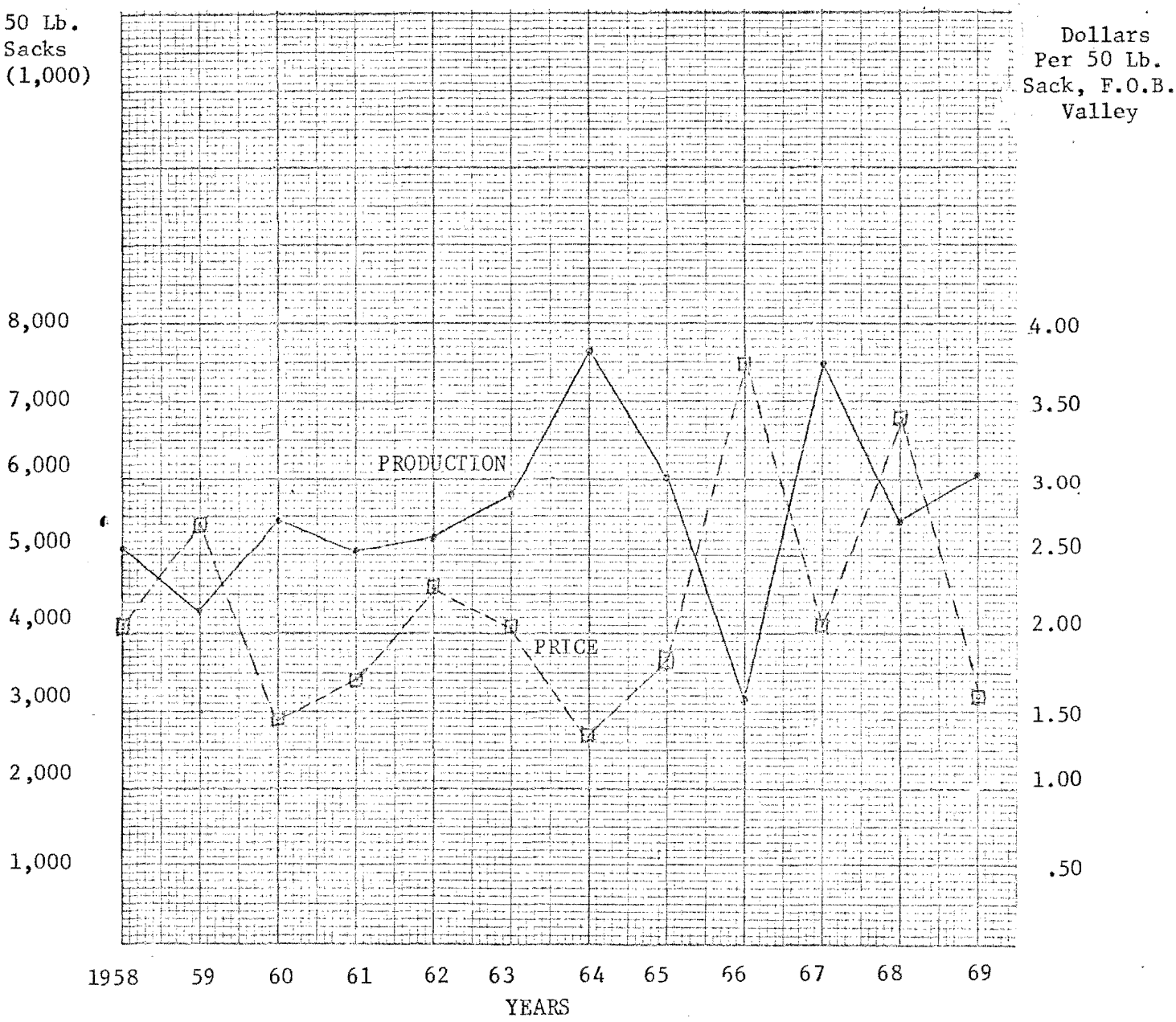


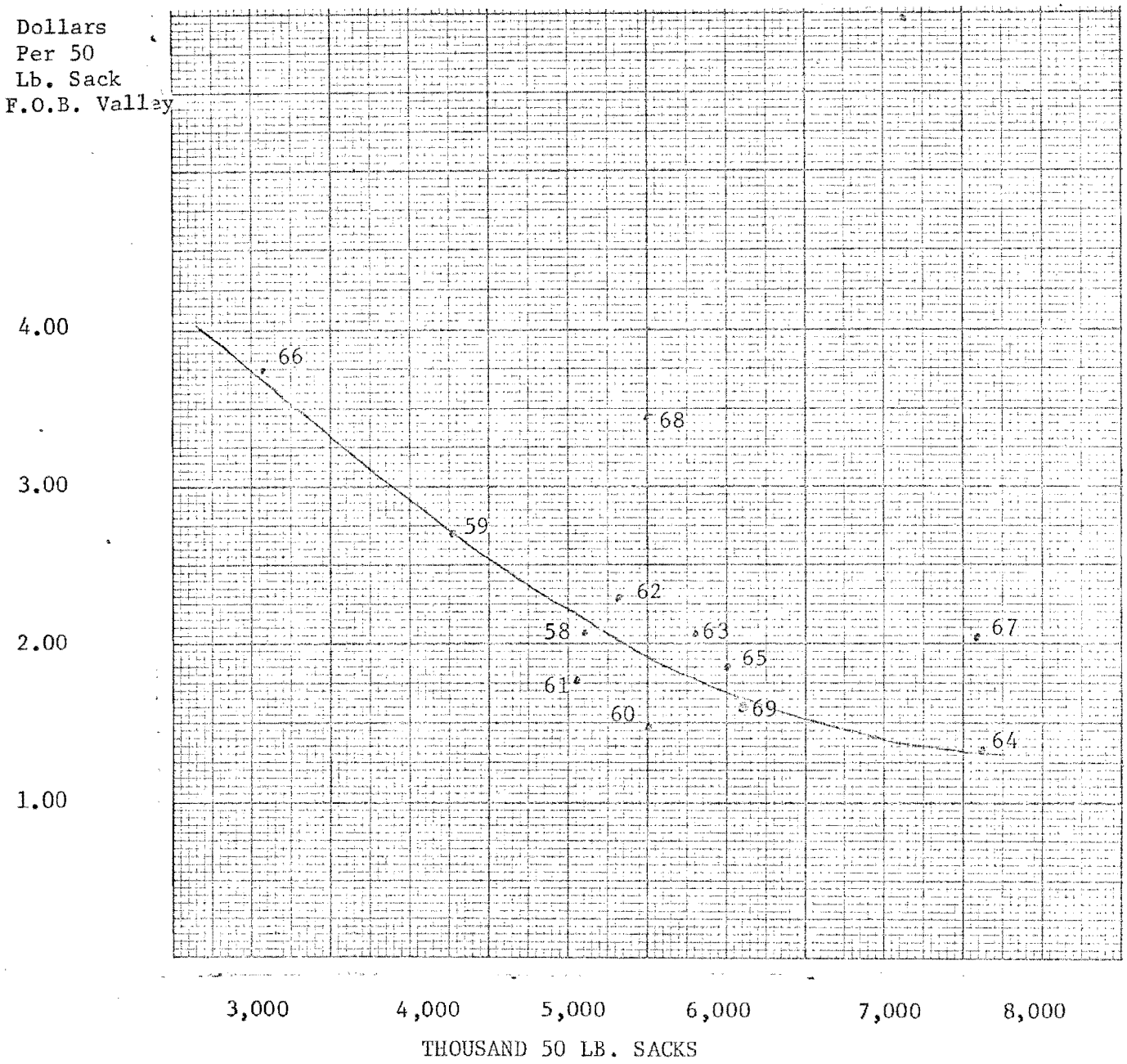
Table 1. Early Spring Texas Onion
Acreage, Production and Average Price
1958-69

Year	Acres	Production	Price[1/]
	No. of acres	1,000 50 lb. sacks	$ per 50 lb. sack
1958	27,000	5,130	2.07
1959	33,000	4,290	2.70
1960	25,000	5,500	1.47
1961	19,500	5,070	1.72
1962	22,300	5,352	2.30
1963	22,600	5,876	2.07
1964	24,600	7,626	1.37
1965	23,100	6,006	1.87
1966	16,300	3,096	3.75
1967	23,000	7,590	2.02
1968	21,500	5,484	3.42
1969	21,000	6,090	1.60

[1/] Price received, F.O.B. Valley shipping points.

Source: Agricultural Statistics, yearbooks for 1960-68 and Crop Reporting Service data for 1968 & 69.

FIGURE 2. Price-Quantity Relationships
For Early Spring Texas Onions



advantages, conditions are available for South Texas onions to be supported by market development and promotion activities. These could be designed to provide extra market demand when production is above average as a result of heavier than usual yields. Above average yields combined with sizable acreage increases, however, are usually more than market promotion can entirely overcome.

The South Texas Onion Committee, the administrative group for a federal market order program, authorized a market promotion program in 1963. Based upon research results obtained by a Texas A&M University Agricultural Experiment Station research team regarding that program, another promotion program was designed for 1964. The question of pre-packaging in consumer size bags was also considered as a possible aid in market promotion. The South Texas Onion Committee arranged for a series of test shipments in 1965 to Midwest and Eastern markets. Texas A&M University, through its Agricultural Experiment Station, was requested to analyze the resulting shipments data.

The purpose of this report is to provide a combined summary of the above three market tests. The results of each test were reported previously on an interum, progress report, or other, basis to the South Texas Onion Committee in official meetings. This combined report was requested in September 1969 in order to make available an overview of the total market testing program effort.

PART II

THE 1963 ONION PROMOTION TEST

Promotion Test Objectives

This report section is an analysis of the effectiveness of an in-store, point-of-sale promotion program for Texas onions. A specially designed portable display bin was used, as the basis of the promotion, Figure 3.

There were two specific objectives of the research test. The first objective was to determine whether sales of onions were increased by use of the display bin. The second was to determine whether the additional demand for onions created by the display bin was at least sufficient to repay the cost of the promotional program; or better still, show a profit over expenses. In other words, did the dollar pay-back exceed the dollar in-put into the promotion.

The Research Procedure

Four cities were selected for the research test: Denver, Colorado; Omaha, Nebraska; St. Louis, Missouri; and Cincinnati, Ohio. Two national food chains cooperated in the test by providing ten test stores in each of these four cities. The promotion bins were used in the stores in Denver and St. Louis. Stores in Omaha and Cincinnati were originally selected as a control group--that is, sales of these stores would be measured under the condition of no display bins or in-store promotion for onions. If onions sales in Denver and St. Louis increased more than those in Omaha and Cincinnati, it would be concluded that the larger sales resulted from

FIGURE 3. A typical view of the South Texas Onion display bin in a food supermarket.

using the display bins. In such a test basic differences prevented the designing of a within city market test.

During the research period, a special trading stamp promotion for onions occurred in Cincinnati. This provided an opportunity to evaluate two types of promotion--the display bin in Denver and St. Louis and the trading stamp promotion in Cincinnati. Omaha remained as the control city--the one without any promotion.

Previous market research experience has shown that the size of a retail display for an item usually affects the amount sold. Consequently, arrangements were made to keep a record of the size of the onion display space in the 40 participating supermarket stores during each weekend for the six weeks of the test.

The number of customers per week in a store also directly affects the sales level of most items. Special arrangements were made, therefore, for the participating food chains to provide weekly customer counts for each of the 40 research stores. Thus, the total onion sales--sales per customer, and sales per customer per square foot of display space--could each be analyzed at the conclusion of the market promotion test.

Onion sales can be expected to vary somewhat in response to changes in their retail price. Consequently, onion prices in each participating store were also recorded each weekend during the entire research period.

Effectiveness of the Promotion Display Bin

Onion sales per 100 customers increased by an average of 21 percent during the promotion period in the ten Denver stores and by 23 percent in the ten St. Louis supermarkets. For the two week period after the promotion, sales continued above the pre-promotion level but were not quite as high as during the promotion, Table 2. These figures, by

themselves, indicate reasonable success. In the control city of Omaha, however, where no promotion occurred, sales in the 10 test stores increased only by about 6 percent on the average. Consequently, there is some doubt, at least, that the sales increase in Denver and St. Louis was entirely in response to the promotion display bin. Table 2 and Figure 4 show the comparative sales figures.

Table 2. Sales of Onions Per 100 Customers In Promotion and Non-Promotion Test Cities, Spring, 1963

Period	Promotion cities			Non-promotion
	Denver	St. Louis	Cincinnati	Omaha
	Pounds			
Before Promotion 1/	7.5	8.0	7.3	5.4
Promotion	9.1	9.8	15.3	5.7
After Promotion	8.7	8.5	6.3	5.7

From the standpoint of onion sales per square feet of display space per 100 customers the sales pattern in terms of raw figures was less clear, Table 3 and Figure 5. The increase in sales in Denver and St. Louis during the promotion was similar to that which occurred in Omaha without a promotion. Sales held or advanced following the special displays in the two promotion cities; but this was also the case in Omaha. Cincinnati stores had a sharp increase in sales as a result of the stamp

1/ "Before promotion" was the 3 weeks preceding the promotion. "After promotion" was the 2 week period immediately after the promotion. In Cincinnati it was the third and fourth week after the promotion, because sales continued to increase the first and second week following the trading stamp promotion.

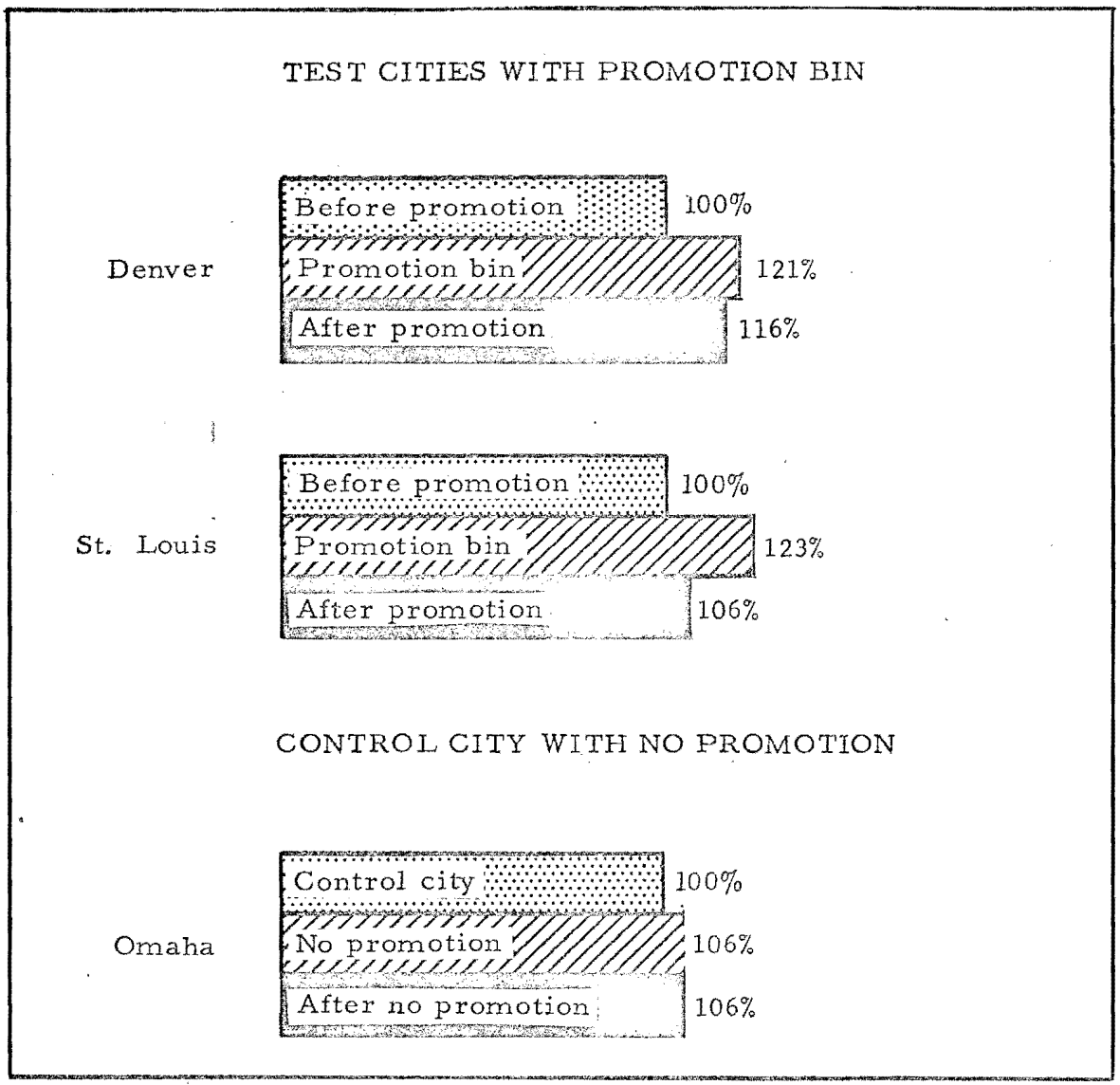


FIGURE 4. Index of onion sales per customer in promotion bin cities and in no promotion cities, spring 1963.

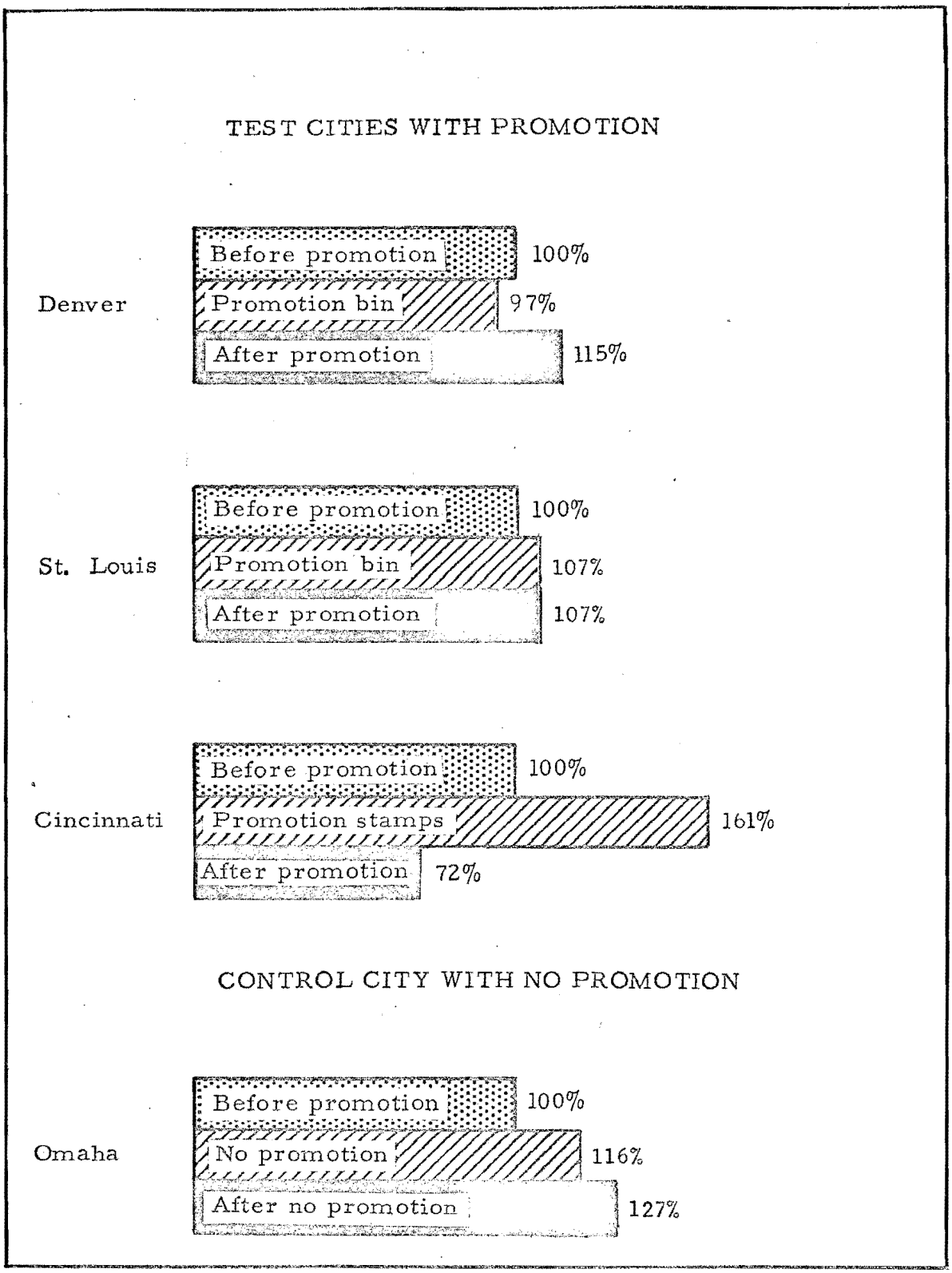


FIGURE 5. Index of onions per 100 customers per square foot of display space, in promotion and non-promotion test cities, Spring 1963.

promotion. The "after promotion" sales average following the stamp promotion showed a decline. Apparently some forward buying of onions occurred by customers during the stamp promotion. It is important to recognize, in evaluating the above, that a major part of the promotion was an increase in display space.

Table 3. Sales of Onions Per 100 Customers Per Square Foot of Display Space In Promotion and Non-Promotion Test Cities, Spring, 1963

Period	Promotion cities			Non-promotion
	Denver	St. Louis	Cincinnati	Omaha
	Pounds			
2 weeks before promotion	.065	.042	.046	.037
2 weeks promotion	.063	.045	.074	.043
2 weeks after promotion	.075	.045	.033	.047

The onion sales data in the three cities of Denver, St. Louis and Omaha were submitted to a co-variance statistical analysis. In such a statistical analysis, the effects of various factors in the test can be measured separately. An important gain is that sales can be viewed exclusive of any general up or down movement in the general sales level during the research period. According to the co-variance analysis, the display bin increased sales by a net amount of 23 percent per customer in the test stores.

A 23 percent sales gain was large enough to be statistically significant, that is larger than would occur as a random sales variation. Thereby we are definitely permitted the conclusion that the display bin was successful in increasing sales. More recent research has pointed up

the fact that one of the principal effects of in-store displays can be the induced increase in display space alloted to the product concerned.

In the preceding analyses, prices of onions were not considered a factor since they remained relatively unchanged in each of the cities. Average prices for bulk yellow onions are shown as an example, by week and city, in Table 4. Yellow onions were the major type sold, representing about three-fourths of the total sales.

Table 4. Price of Texas Yellow Onions Per Pound in Market Test Cities

Week	Promotion cities			Non-promotion
	Denver	St. Louis	Cincinnati	Omaha
	Cents per pound			
1		12.6	13.0	2/
2	10.0	13.0	13.0	8.0
3	9.0	13.0	13.0	2/
4	8.4 1/	13.0	13.0	10.0
5	8.4	12.2	13.0	10.0
6	9.0	11.8	13.0	10.0
7	8.9	12.7	13.0	10.0

Results Of The Trading Stamp Promotion

A sizeable gain in onion sales was achieved by a trading stamp promotion. It consisted of offering 25 free trading stamps with the purchase of 3 pounds of onions. A similar offer was made on seven other food items the same week. Onion sales per customer increased by 110 percent, Table 2 and Figure 6.

1/ Figures underlined indicate onion promotion weeks.

2/ Only white Texas onions reported.

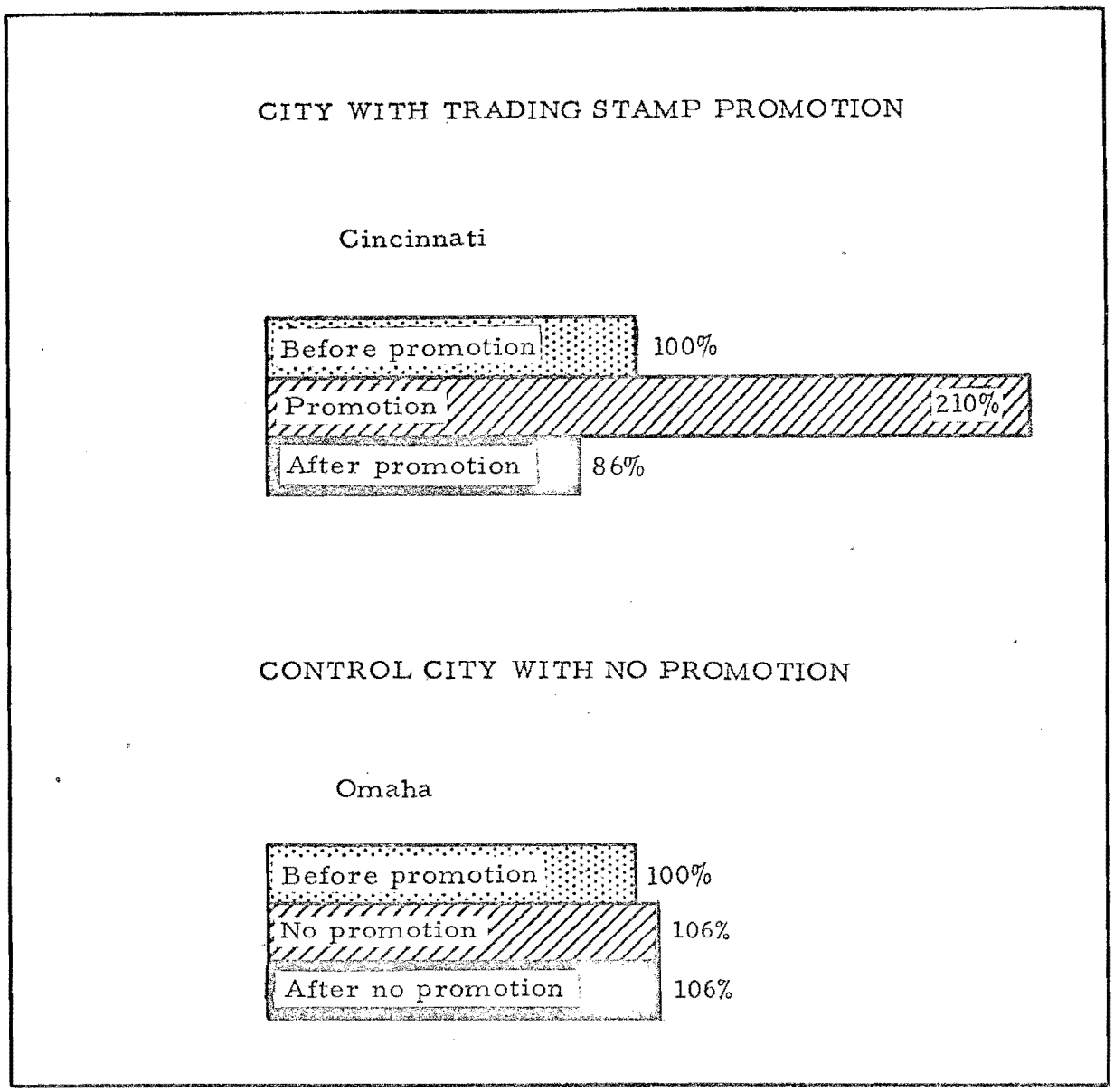


FIGURE 6. Index of onion sales per customer in trading stamp promotion and no promotion cities, spring 1963.

Sales continued above the pre-promotion average for the next 2 weeks. Following that, sales declined somewhat below the pre-promotion level. This is an after-effect which should be observed closely in future promotion tests. A promotion of the right strength should increase sales noticeably, but not necessarily so greatly as to force sales below normal levels following the promotion.

The success of the trading stamps promotion also was evident from the results of the statistical co-variance test. Sales per customer, according to that analysis, were 110 percent larger, or more than double, during the stamp promotion than immediately before. Statistically the sales increase was, of course, highly significant.

Costs Versus Returns From The Two Types Of Promotion Programs

The objective of any promotion program is to increase sales and profits. The economic payoff of a promotion program can be evaluated from either a short or long-run viewpoint. Under a long-run program, cumulative effects can develop that do not appear initially. Since the promotion tested represented the first effort by this producer group, long-run effects cannot even be surmised, much less properly evaluated. Nonetheless, preliminary indications should be evaluated.

Promotion Display Bin Cost and Return:

From the short-run standpoint, the cost of the promotion display bin per store averaged about $5. Assuming retail prices averaging about 13 cents per pound, sales would have to increase by about 39 pounds per store, over the two-week promotion, in order to raise gross sales by enough to equal the $5 cost of the display.

Fruit and vegetable producers normally receive about one-third of the final retail price. Thus, if growers are to have enough extra sales to regain the cost of the promotion, sales would have to increase by about 120 pounds per store at unchanged retail prices. The average increase in this test was about 140 pounds per store. This is an "after-production" analysis so onion production costs are not considered.

However, production within a given season is fixed. Consequently, the effect of a successful promotion would be to increase the demand for a fixed, already produced, supply. A rather elementary analysis of price-production relationships during 1956-61 suggests that the elasticity of demand for South Texas onions, at F.O.B. shipping point, is about -0.7. Achievement of a 23 percent increase in demand would consequently result in a 33 percent price increase at the F.O.B. shipping point level. For the average season, this would mean a leverage toward a price increase of about $1 per 100 pounds. How much the leverage actually achieves, in the short or long run, depends upon the length and frequency of the promotions and how widely they are held.

Sales per supermarket, in the four-city promotion test, averaged about 600 pounds per week. A promotion, boosting demand 23 percent, and raising the price $1 per cwt., would result in approximately a $6 increase in returns per store, on a 1 week basis at the F.O.B. level. Any promotion program costing about this much, per store, might only break even, on a cost-return basis. This indicates that a promotion program costing $2 to $3 per store would appear to be a desirable target for 1-week, in-store displays, if conditions as outlined in this research prevailed. The expenditure of about $5 per store, as occurred in 1963, may be somewhat out of line with practical short-run goals of economic feasibility. If a display is kept in the store 2 weeks, with equal sales results, then the

return on the display material investment is doubled, making a return of $12 per store. Thus if the display bin is used 2 weeks, the return to the producer organization might exceed the cost. It is recognized that measurement of all residual benefits of advertising and promotion are not taken into account. Furthermore, this analysis assumes a promotion in all or most food stores in the product's geographic market area. Nonetheless, the preceding information should assist in decision-making regarding the design and operation of such in-store promotion programs for this commodity.

Overall, the modest investment this promotion program represented suggests that it was a profitable venture. The cost amounted to the equivalent of only about 1 cent per 50 pound sack marketed. Launching of the promotion, and resultant trade publicity, appeared to speed up the clearing out of the stocks of storage onions, thereby strengthening market prices for the Texas crop. However this was a conclusion of the market order manager and was not subjected to statistical analysis. Competitive marketing of foods involves market strategy as much as for any other product. The promotion in 1963 appears to have been very good market strategy in addition to being successful from the viewpoint of dollar input and dollar returns.

Trading Stamp Promotion Cost-Return

The unscheduled promotion program was that of giving trading stamps with the purchase of onions. The first analytical step is to determine the expense of this type of promotion. Trading stamp cost to a food store is about 2½ cents per dollar of gross store sales. Usually, ten stamps are given per dollar purchase by customers. Thus, a single trading stamp costs the store about a quarter of a cent.

The onion promotion offered 25 trading stamps for a purchase of 3

pounds or more of the product. This represented a stamp cost of 6¼ cents. On a per-pound basis, the cost was equivalent to 2.1 cents.

Although the average sales volume in the Cincinnati, Ohio test stores were about 500 pounds per week, sales increased to about 1,170 pounds during the promotion week. The cost of the promotion was thus about $24.60 per store, or about five times the cost of the display bin.

The economics of the trading stamp promotion are interesting from the food store viewpoint. With a gross margin of 4 cents per pound, within a 13 cent retail price, increased sales of 670 pounds of onions would return about $26.80 per store. Compared with an average cost of $24.60 per store for trading stamps, a gross profit of $2.20 would be received by the store. This is a highly oversimplified analysis. For example, there are cross effects, no doubt, on sales of other items in the store. Thus, all is not gain, and the profit to the store on an overall basis may be more or less, depending on sales of other items and customer attraction effects for the store itself.

The combined economic effects at the retail and producer level require analysis, assuming a fixed supply of onions. Increasing demand by 134 percent, as the stamp promotion did, would, at a maximum, raise the price for a fixed supply by 74 percent at the grower level. For an average season this would mean a price rise to producers from the level of about $4 to one of $7 per cwt. Retail prices would rise from an average level of about 11.5 cents per pound to 17 cents, according to the usual relationships over the past 9 years. Selling 500 pounds at the higher price would return an added gross of $27.50 per store.

The cost of the trading stamps, at 2.1 cents per pound of onions sold, would be $10.50 per store. Thus, a net profit of $17 per store would be achieved, over costs, by using the trading stamps. The resulting $3.40 per cwt. profit could be divided in any number of ways between the retail stores and onion producers.

Under prevailing price relationships of the past 10 years between the retail and producer levels, producers would gain $3 of the $3.40 net profit per cwt. The assumption, in this case, is that the retail stores pay for the trading stamps.

It would not be feasible to have a continuous stamp promotion for onions. Therefore this illustration is not realistic. Yet on the other hand it helps identify the extremes between which the actual answer exists.

The preceding analysis indicates that it might be feasible for the onion producers to share in the cost of the stamp promotions and still profit from it. For example, half of the cost of the stamps would be about $1 per cwt. Compared with the indicated $3 per cwt. gain, a net profit of $2 per cwt. would still remain. Programs of this type can be extremely difficult to control and have many potential pitfalls, but they are not essentially different from couponing which is widely practiced for grocery store items.

It should be clearly understood that the foregoing economic cost versus returns analysis is exceedingly over-simplified and, furthermore, is subject to considerable error. A correct evaluation will require a much more rigorous analysis of the effects of a temporary demand increase on the total season average price, which in turn is related to the impact upon the seasonal pattern of marketing for the crop.

Conclusions

Several important conclusions resulted from the 1963 onion promotion test. The approximately 20 percent increase in Texas onion sales in the test stores demonstrated that point-of-purchase promotion material can be effective for the mild flavored Texas onions.

Use of the display on a two-week bases in stores offers a possibility of being profitable to growers as well as the retail stores. However, more complete information on store effects and grower price effects is needed for a final conclusion.

Experience with the display bin in the test stores suggested that a bin is not the most efficient nor effective sales promotion tool from a cost standpoint. Use of printed advertising banners that could be used in more varied ways, and adapted to each stores own conditions, appeared advisable both from a cost and in-store use viewpoint.

PART III

THE 1964 ONION PROMOTION TEST

Description of the Market Test

A second in-store promotion test for South Texas onions was conducted during the Spring of 1964. Used in this market test were two significant changes from the 1963 program. First, printed, colored display banners were the point-of-sale material instead of a cardboard display bin. The display banners were distributed to stores in kit form, with instructions for their use. This type of material corresponds to similar display banners used by Sunkist, the Florida Citrus Commission and other marketing groups.

The second major change from the 1963 test was the use of matched sets of promotion and non-promotion stores within the test cities. Again four cities were used--Oklahoma City, Oklahoma; Kansas City and St. Louis, Missouri and Nashville, Tennessee. As in the 1963 test, national chain supermarket food stores were the test stores. Records were kept on a weekly basis of store sales, product prices, size of display space, as well as customer count on a total store basis.

Market Test Results

Records of onion sales were kept in all stores for three weeks prior to the placing of the point-of-sale material in half of the stores. Altogether 56 stores were involved in the test, 14 in each of the four test cities. As noted in Table 5, sales increased in the promotion stores in all four cities. The gain in comparison with the non-promotion stores was 16 percent in Oklahoma City, 35 percent in Kansas City, 11 percent in St. Louis and 23 percent in Nashville. Except for the St. Louis stores,

FIGURE 7. Example of in-store display using South Texas Onion display material kit.

TABLE 5. RESULTS OF
SOUTH TEXAS ONION PROMOTION TESTS

Average Sales Per Week Per Set of
Seven Stores, By City and Test
Period, Spring 1964

PERIOD	OKLAHOMA CITY				KANSAS CITY				ST. LOUIS				NASHVILLE			
	7 Stores with PROMOTION		7 Stores no PROMOTION		7 Stores with PROMOTION		7 Stores no PROMOTION		7 Stores with PROMOTION		7 Stores no PROMOTION		7 Stores with PROMOTION		7 Stores no PROMOTION	
	lbs.	%	lbs.	%	lbs.	%	lbs.	%	lbs.	%	lbs.	%	lbs.	%	lbs.	%
Week # 1, 2, & 3 Before Promotion Average	5188	100	5151	100	5511	100	5196	100	7897	100	5126	100	5892	100	6029	100
Week # 4 & 5 Promotion Average	5595	116	5163	100	7696	140	5476	105	9630	122	5679	111	7218	123	6035	100
Week # 6 & 7 After Promotion Average	4831	93	4107	80	5581	101	4410	85	7989	101	5232	102	7025	119	5703	95

Summary:	Promotion Stores		Control Stores	
	lbs.	%	lbs.	%
Before Promotion	24,488	100	21,502	100
Promotion	30,539	125	22,353	104
After Promotion	25,426	104	19,452	90

sales in the promotion stores remained above those in non-promotion stores, even after the in-store advertising had stopped. Presence of such a positive sales after-effect is a mark of a successful promotion and market development program.

Sales increases, on a combined four-city basis, were 25 percent for South Texas onions. However, since the sales in the matched, non-promotion stores gained by 4 percent, the net gain by the promotion was at least 21 percent. It is conceivable that the sales rise in the stores without the promotion material was a "spill over" effect. Lacking positive information to that effect, however, it must be assumed that such was not the case.

Not only was there a 21 percent gain in Texas onion sales during the promotion, but also sales by the promotion stores were about 14 percent above the non-participating stores during the two-week period following the withdrawal of the in-store displays.

The sales data were analyzed by covariance statistical procedures, as in the 1963 test. The application of statistical reliability tests revealed that the increase in sales was beyond the level that might have occurred by any chance week to week sales variations. Tests were made on a 95 percent probability basis. This was true whether the sales were viewed on a total basis, or from a sales per square foot of display and customer count approach.

Cost Versus Returns Estimate from the Promotion

The display kits used in the 1964 promotion test are estimated to have cost approximately $2.50 each. There was one kit per store. Sales increased by 5,200 pounds in the 28 promotion stores during the two weeks of the in-store displays. At 11 cents per pound that would total over

$575 gross versus a display material cost of $70. On the basis of a 30 percent margin at the retail store, the gain among the retail stores is $173 per week. Even if the stores bought the display material at $2.50 per kit, or $72.50 for the 28 stores, a net gain in gross profit of $100 per week is taken.

Prices received by growers are reported by the U.S. Department of Agriculture to have been $1.37 per cwt. in 1964. The increased sales of 5,200 pounds per week would be a gross return of $71 compared to a cost of $72.50 for the display kits in the 28 test stores. On balance, even at these low prices, the grower is better off by having the promotion, once the onions are harvested. Demand is expanded thereby and prices receive some upward support over what would otherwise be the case.

Conclusions

Results of the 1964 in-store promotion campaign definitely established again that demand for South Texas onions can be increased by such a program. Sales increases of 21 percent compared with gains of about 20 percent achieved in the 1963 market test.

Use of the point-of-sale printed material was a desirable move, as suggested by the Texas A&M research team on the basis of the 1963 test. Equal sales increases were achieved at a cost of $2.50 per store for printed material kits rather than the $5.00 cost of the display bins used in 1963.

The variability of onion production is such that strongly indicated is the need for processing outlets for the product. During years of heavy production, excess supplies could be diverted to processing and ease the pressure on the fresh market prices. The growth of specialty food houses on a franchise basis opens added markets for prepared products such as onion rings, and chopped onions. Therefore, from a market development

viewpoint, these possibilities deserve serious consideration, exploration and market testing, if the onion industry of South Texas wishes to have market expansion and more latitude in marketing strategy for their production.

PART IV

AN ANALYSIS OF TEST SHIPMENTS OF PREPACKAGED AND 50-POUND SACK SOUTH TEXAS ONIONS, 1965

Introduction

In the market test of the in-store promotion for South Texas onions, it was observed that food chain supermarkets sold a considerable volume of onions in pre-packaged, 3-pound bags. A promotion program for the Texas onions could be aided considerably by product identification on pre-packaged containers. A decision was made by the South Texas Onion Committee to arrange for test shipments of pre-packaged onions from the Texas Rio Grande Valley area. Results of these tests made in cooperation with shippers, U.S.D.A. inspectors and others at receiving points were made available to the Agricultural Experiment Station at Texas A&M for analysis.

Test shipments of the prepackaged South Texas onions were in consumer size, three-pound and five-pound, plastic mesh bags. A few shipments were also made in plastic film perforated bags. Test shipments were sent in master containers which resulted in the following combinations: 15 three-pound bags, 12 three-pound bags and 10 five-pound bags.

The quantity of onions in the test totaled 36,932 master container bags divided among 158 separate shipments. These occurred during the 74-day period beginning March 17, 1965, and ending May 29, 1965. Destinations of the shipments included 43 cities and 22 states in the United States.

Two primary purposes were established for the shipping test. One was to determine if decay occurred among prepackaged onions sufficiently to create a marketing problem. The second was to determine whether growers received a higher, the same, or a lower net price for prepackaged South Texas onions compared with those sold in the customary bulk 50-pound sacks.

Arrival Condition of Prepackaged Onions

It was the responsibility of the United States Department of Agriculture fruit and vegetable inspectors to reinspect selected shipments upon arrival at destination. Seventeen reinspections were reported. Cities represented follow:

Boston, Massachussetts	Jacksonville, Florida
Buffalo, New York	N. Kansas City, Missouri
Miami, Florida	Montgomery, Alabama
Raleigh, North Carolina	Robbinsville, New Jersey
Norfolk, Virginia	Tampa, Florida
Altoona, Pennsylvania	Pittsburgh, Pennsylvania

The amount of decay among onions in the respective shipments was recorded and reported to the office of the South Texas Onion Committee--a federal market order program. According to these figures made available to the Texas Agricultural Experiment Station on individual shipments, decay was from less than 1 percent to no more than 2 percent for onions prepackaged in plastic mesh consumer size bags, with one exception. That exception was one that had 4 percent decay. In contrast, onions prepackaged in perforated plastic film bags had a reported decay ranging from 2 percent to 14 percent. Thus the use of plastic mesh bags offered a definite advantage for prepackaging Texas onions.

Prices Received for Prepackaged Onions

Appropriate statistical methods were employed to analyze the reported prices received for prepackaged and 50-pound bulk sacks of South Texas onions in the test shipments. Least squares analyses were employed to ascertain which factors--the shipper, week of shipment, size of pack, or size of onion--significantly influenced the F.O.B. and Grower prices received. The relationship between F.O.B. and Grower prices was measured by correlation analysis. The well-known t test and Duncan's Multiple Range Test were used to measure

the significance of the difference, if any, between the prices received by growers for onions marketed in 50-pound sacks compared with prices received for those marketed prepackaged in the various consumer size bags.

Factors Influencing FOB and Grower Price

The analysis indicated that the shipper, the week of shipment and the size of pack[1/] influenced significantly the FOB price, as well as the price received by the grower. Onion size, on the other hand, did not significantly influence either the FOB or the Grower price. Sizes in a single shipment included one of the following ranges: 1 3/4 to 3 inches, 2 to 3 1/4 inches, 2 to 3 1/2 inches, 2 1/4 to 3 1/4 inches. Different buyers have different size requirements, a factor influencing the variations accepted.

Relationship between FOB Price and Grower Price

The correlation coefficient of 0.94 indicates there was a highly significant relationship between FOB and Grower prices. Prices received by growers were closely related to the FOB prices received for the specific lot of onions. Over 80 percent of the variation in the price received by the grower was the result of differences in the FOB prices.

Relationship between Grower Prices Received for Various Size Packs

The average prices received by the growers for each size pack during the period March 17 to May 29, 1965, are shown in Table 6 and Figures 7 and 8.

The prepackaged onions, all except the 12/3's, returned growers a higher average price per 50 pounds of onions than was received for onions

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1/ Pack sizes were 16/3, 15/3, 12/3 and 10/5. The 50-pound bag was not included in this analysis.

marketed in the 50-pound sacks. According to information received, the 12/3's were a special pack for a military contract.

Table 6. Average Onion Prices Received per 50 Pounds by Growers According to Size of Pack and Time of Shipment, Texas, March-May, 1965

Time Period		Size of Pack				
		50 lb.	Prepackaged			
Week No.	Days	Sacks	16/3 lb	15/3 lb	12/3 lb	10/5 lb
		Dollars per 50 pounds				
					(Special Pack For Military)	
1.	3/17 - 23	.57	--	.98	--	--
2.	3/24 - 30	.74	.80	1.16	.58	--
3.	3/31 - 4/6	.99	--	1.61	.82	--
4.	4/7 - 13	.79	.84	1.05	.44	1.10
5.	4/14 - 20	.40	.68	.64	.27	.75
6.	4/21 - 27	.38	.98	.50	.25	.86
7.	4/28 - 5/4	.46	1.42	.77	.26	.89
8.	5/5 - 11	1.03	2.07	1.02	--	1.52
9	5/12 - 29	1.87	3.95	2.05	1.50	1.87
	Average	.91	1.36	1.06	.50	1.16

Table 7 shows the results of the t tests which measure the significance of the differences between the prices received for onions marketed in 50 pound sacks and those received for onions in the smaller packs. A significantly higher price was received for onions marketed in the 16/3 and 10/5 packs compared with the 50-pound sacks. Also, a significantly lower price was received for the military shipment--those sold in the 12/3 pack. The price for the 15/3 pack was higher, but not significantly

FIGURE 8: Onion Prices Received By Growers For Various Size Packs, Texas, March - May, 1965.

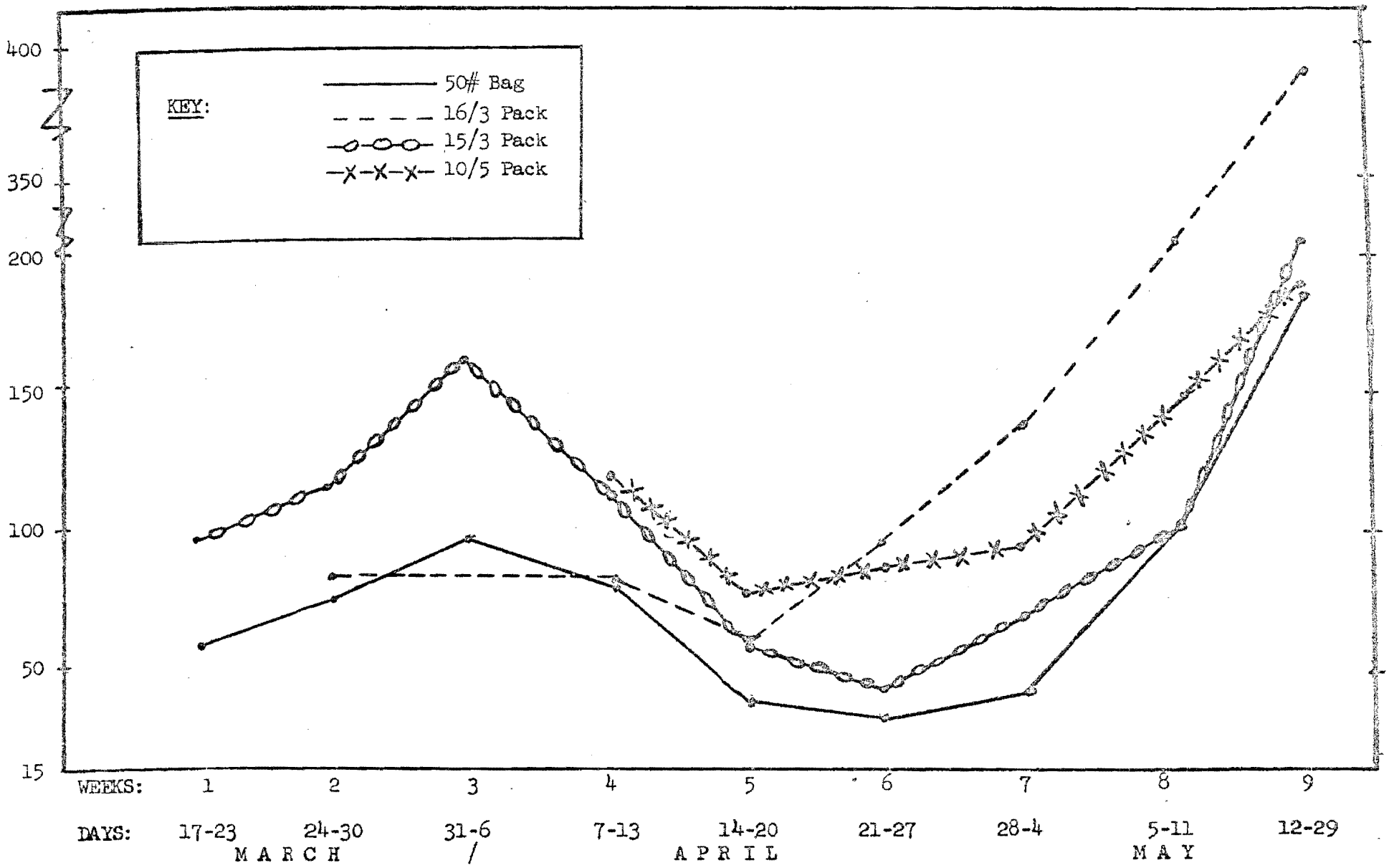
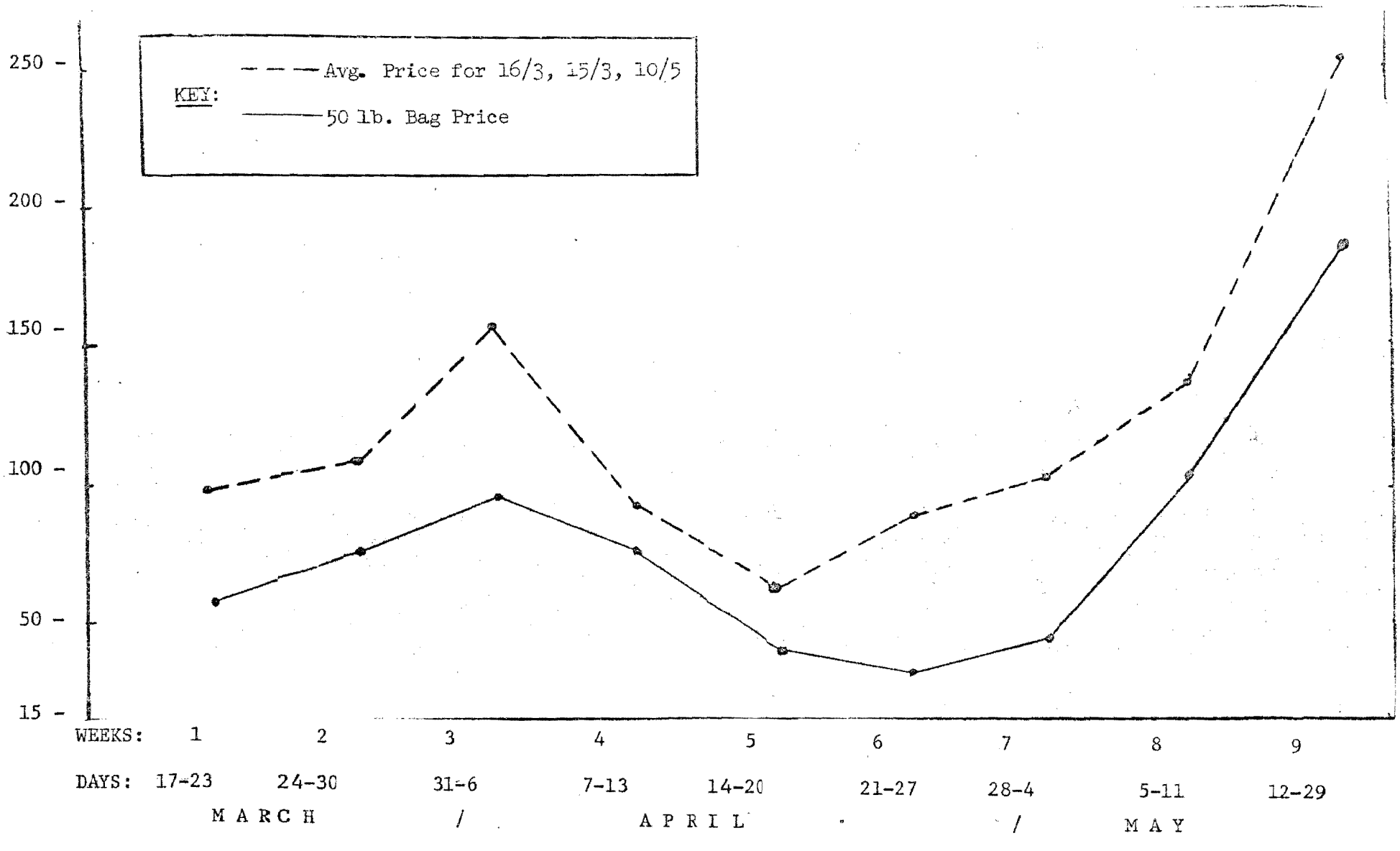


FIGURE 2: Onion Prices Received by Growers For Various Size Packs, Texas, March - May, 1965.



different than the 50-pound sack price. This, however, can be simply a lack of enough observations on the 15/3 lb. size, for obviously the price was higher. The average price received for prepackaged onions in this test, excluding the military pack, was significantly greater than for the 50-pound sack price.

Table 7. Relationship Between Price of Onions in 50-Pound Bags Compared to Equivalent Price Received in Packages of 16/3, 10/5, 15/3 and 12/3, Texas, March-May, 1965

Comparison	df	t value	Value required for significance	
			.05	.01
1. 50 lb. sack price vs. 16/3 price	86	2.41**[a]	1.67	2.38
2. 50 lb. sack price vs. 10/5 pack price	54	1.68*[b]	1.67	2.40
3. 50 lb. sack price vs. 15/3 pack price	96	1.36 (ns)[c]	1.66	2.37
4. 50 lb. sack price vx. 12/3 pack price	56	2.56**	1.67	2.40
5. 50 lb. sack price vs. price of 16/3, 15/3, 10/5	163	2.22*	1.64	2.33
6. 50 lb. sack price vs. price of 16/3, 15/3, 10/5, 12/3	180	1.59 (ns)	1.64	2.33

a Indicates significance at the .01 level.
b Indicates significance at the .05 level.
c Indicates non-significant results.

Conclusions

On the basis of the price data obtained from this test, prepackaged onions were found to return a higher price to the South Texas onion grower, on the average, than those sold in 50-pound sacks. Also, the amount of product decay in the plastic mesh bag was generally less than 2 percent. It should be recognized, however, that this represents only a test during one season. Usually it is advisable to repeat such tests for further verification since there may be variations in results among different crop years.

A considerable proportion of onions are sold on a prepackaged basis in retail stores. However, it would not likely be advisable to prepackage all South Texas onions since some consumers prefer to buy from bulk displays. If further tests confirm the favorable results of this test, the question of what prepackage size is best and what percentage of the crop should be prepackaged still remains. Also further tests of quality at receiving points are desirable to confirm that any product decay will remain at nominal levels acceptable to retail outlets.