

THE MARKET POTENTIAL FOR GRADED
POMPON CHRYSANTHEMUMS

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ABSTRACT

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By Margaret Jane Coleman

Pompon chrysanthemums were grown and sorted to three standard grades designated by minimum stem length and open flower count. A mixed bunch was used as the basis from which to make price differentials for each grade. The three grades and mixed bunch were sold, primarily to a sample of six retail florists, through a wholesale florist for a ten week period.

After two weeks introduction in the market at market prices, the prices of the different grades were varied by week, and the sales data recorded. Market demand relationships were calculated by multiple regression analysis between percentage sales of each grade and both price differentials and price ratios among the groups. Few observations could be obtained and statistical evidence can be viewed as tentative. Regression coefficients were not significantly different from zero, and indicated buyer indifference to the relative price changes of most of the grades in the range used for this test. However there was a trend for price thresholds for the largest grade to be at 50 and 75 cents over the standard price, with the mixed bunch being substituted for that grade.

Each of the six cooperating retail florists was interviewed regarding grading for pompon chrysanthemums. Their responses indicated that three grades may have been unnecessary because little differential use was found for each. However, the majority was in favor of grading.

The evidence obtained in this study indicates that graded pompon chrysanthemums would be generally acceptable in the market.

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By

Margaret Jane Coleman

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CHAPTER I

INTRODUCTION

Grades and standards for cut flowers and potted plants have been under discussion for a number of years. Several systems have been developed, but only grades for Asparagus plumosus and Paeonia species have been adopted officially by the U. S. D. A. (19).¹

Some far-sighted commercial flower growers have tested and adopted grading systems for other crops with success. However, many floriculturists are apprehensive about adopting any system of grading because they see little benefit in terms of enhanced profits for a possible outlay of extra equipment and labor. It may take some time for the grading and packing staff to become fully acquainted with a new grading system. Taking also into account the time it could take the wholesalers and buyers to accept the new grades, the grower may become discouraged if he is not assured of positive benefits from grading.

There are several motives for grading, all of which can be equated with enhanced profits. A number of reasons

¹Numbers in parentheses refer to "Literature Cited," pages 76 to 78.

for the development of standard grades for floricultural products have been discussed (6). These include the need for a common language between sellers and buyers (4,24), and for accurate recording. The increase in business volume carried out by telephone, the development of new markets, and the use of contracts and standing orders are contributing to the increased urgency with which standardization is required. The value of any proposed grading system tested in the market place is probably never fully realized while the majority of the same crop being marketed remains ungraded.

The purpose of grading is "to sort products into mutually exclusive groups of approximately the same characteristics of type or size or quality,² or of two or all of these characteristics."³ The development of grades according to type and size, with a consistently high level of quality, is one concern of the flower industry and of this thesis.

²Quality is here defined as that characteristic of the product, aside from dimensions and price, which influences a potential buyer to purchase a particular sample of one product.

³F. E. Clark and L. D. H. Weld, 1932. Marketing Agricultural Products in the United States (The MacMillan Company, New York), p. 254.

In 1965, Goodrich (12) reported on problems of obtaining continuous grower support, as have other researchers cited in the next chapter. For this reason a flower grading economics study was initiated at Michigan State University (MSU) using primarily pompon chrysanthemums grown, graded, and marketed from the MSU greenhouses.

In this preliminary phase of the study the answers to four main questions were sought. These questions are:

1. Is grading acceptable to the flower industry?
2. Will grading pay (in terms of efficiency as well as higher returns)?
3. What grades are desired by the market (retailers)?
4. What price differentials will the market pay for different grades?

A series of three different grades was introduced. These grades or those in some similar grading system would not only enable the publication of more accurate market information, but retailers would be able to purchase large or small stems according to their needs. These benefits resulted when carnation grades were tested by North Central Region committee⁴ researchers.

⁴Page 12.

Answers to the above questions were sought in the following ways:

1. Pompon chrysanthemum crops produced at MSU were graded and marketed for a ten-week period.
2. Market demand relationships were calculated by multiple regression analysis, to show the market response to different grades at various prices.

Personal interviews were conducted with purchasers and users of the graded pompon chrysanthemums, to add information regarding the acceptability and usability of the grades used in this study.

From the experience gained in this first market test, recommendations for future testing procedures have been made; these are contained in Appendix V.

CHAPTER II

REVIEW OF LITERATURE

General Background

In a recent survey of mass market outlets (25) a great potential for the sale of cut flowers through super-markets and variety stores was indicated. Major problem areas included the perishability of flowers, obtaining adequate flower supplies, and price fluctuations. Improved packaging and display methods could reduce wastage, while supply and price problems might be partially solved through contracting.

One way to facilitate contracting and to reduce the risk to both parties is to sell goods of consistent quality and clearly defined dimensions. Standardized grading will be even more useful than individual systems since price quotations and contracts could be based on standard products throughout the industry. Buyers will need to be less concerned with individual variation with national rather than local standards.

Grades are complementary to advertising and promotional efforts (7) which are in turn "of major importance if the growth potential for the industry is to be realized."¹

¹U. S. Department of Agriculture, Economic Research Service, 1966. The Demand for Flowers-by-Wire by Sidney E. Brown, Marketing Research Report No. 762 (Washington, D. C.) p. 1.

The words "grade" and "quality"² have not yet been isolated from one another in the minds of many people. To establish a certain standard for quality, various basic specifications are determined. These include flowers of one variety packed together (unless otherwise stated), freedom from disease or damage, characteristic shape, and a stated maturity level. A grading system with such basic requirements will enable the flower grower to grade into groups defined by size, all groups having the same specified quality. As exceptions arise, the grades may be modified with descriptive qualifications.

Two major questions raised by the industry when a grading system is suggested are:

1. Does the market want standard grades?
2. Will it pay the grower to grade his produce to different standards than used at present (his own system)?

These issues are mutually dependent, and a number of studies have been conducted to point out the benefits of standard grading to the industry.

An experienced grader should require little or no extra time to grade to some standard system rather than to sort to the grower's personal specifications. It has been found that in grading carnations and standard

²Page 2, footnote 2.

chrysanthemums to North Central Region (NCR) specifications,³ an initial increase in time of up to 60 per cent was experienced for the process (12). After 12 months of continuous grading this increase had been reduced to negligible proportions, and certain efficiencies appear to have been introduced:

The added care and precision required to carry out a grading program over that required to simply sort and pack flowers with little regard to quality calls for an additional investment in time. Yet, it appears that the systematic handling procedures resulting from the maintenance of a strict grading operation introduced some efficiencies. Whatever added inputs were needed in order to comply with close attention to quality factors were offset by a more effective use of the labor in other phases of flower preparation. Handling techniques that had previously been somewhat haphazard were streamlined for more efficient output by grower incentive during the later stages of this research project.

Thus it was implied that the growers involved may not have been achieving all possible efficiencies in their handling and packing procedures; yet the actual operations within "handling and packing" for which labor time was decreased were not specified. A verbal report from one wholesaler, on a two-grade packing system for pompon chrysanthemums that was introduced by a commercial grower for use at peak crop times, indicated that efficiencies

³Page 12.

were found in the same processes that had become extra time-consuming in the initial stages. In other words, the time lost through the necessity of retraining all members of the packing team was regained as they learned.

Extra equipment for grading may not be necessary, except for that which will, in the long run, speed output and/or reduce the number of required workers.

Additional costs for specially printed wrappers may be overcome by using the same printed labels with different colored tags glued or stapled in place to designate the grade of the contents. This method was used with evident success in record-keeping in the study reported by Goodrich (12).

Standard grading will lead to reduced buying and selling costs because of less required inspection time. If buyers are willing to pay a higher average price for graded rather than ungraded material, the grower will receive higher returns for the graded flowers. Higher prices are possible because bunch content is stated explicitly and there should be little potential wastage from the bunch.

It has been said (13) that standard grades will be of no benefit to small producers selling their crops locally; and that their greatest advantage is to be found in better service to their customers than can be given by

larger growers. However, standard grades can be combined with personal service and individual differentiation, as Berninger has pointed out (3).

While buyers fear dishonesty among growers in labeling their produce to any given standards, the growers themselves are opposed to legislation which will enforce the standards. However, it has already been shown that carnation grades result in increased returns to growers and enable more accurate purchasing to take place (1). The carnation grades in use today are not enforced, nor are they nationally standardized, but the industry has recognized the need for more uniform grades and is working towards that goal. When grading becomes nationally recognized the position regarding enforcement will undoubtedly have to be re-examined in order to avoid abuses.

Pompon Chrysanthemums

In 1966 the wholesale value of pompon chrysanthemums in 23 selected major flower-producing states was 22 million dollars for 28.3 million bunches sold (27). Florida is the leading pompon-producing state, having sold 41 per cent of the 23-state volume. California sold 21 per cent, and Pennsylvania with third with 7 per cent of the total volume.

The majority (91 per cent) of these pompons was sold at wholesale, frequently in other states. The Michigan-grown pompon sales were approximately 0.89 per cent of the 23-state total volume in 1966, and imported pompons were always available in wholesale markets.

The 1965 population of Michigan was about 4.2 per cent of the United States' total, and is expected to increase at the same rate as the total U. S. population to 1980.⁴ Since a much lower percentage of pompons, than that of the population, was produced in the state, Michigan is an excess demand area. Based on observations in Detroit, Flint, and Lansing wholesale markets, pompons and other main flower crops are imported continuously. They come primarily from the three major flower-producing states and from Ontario.

Early grades for pompons, under the Cornell Standard Weight (CSW) system, were by weight per spray and stem count per bunch (21, 22). During their development it was reported that retailers liked uniformity of stem size and number in each bunch (20). The CSW grades were endorsed by the Society of American Florists (SAF) in 1954, and are as follows:

⁴Project '80, 1966. "Rural Michigan--now and in 1980; highlights and summary" (Agricultural Experiment Station and Cooperative Extension Service, Michigan State University, East Lansing), p. 1.

CSW/SAF Grades for Pompon Chrysanthemums

Grade	No. sprays per bunch	Weight per spray: oz.	Weight per bunch: oz.	Stem length: inches
Special	3	2½ and up	9 and up	24 - 36
Fancy	6	1½ - 2½	9 - 12	20 - 30
Extra	6	1 - 1½	6 - 9	20 - 30
First	12	½ - 1	6 - 9	20

In 1957 a study was conducted to investigate the acceptance and economic feasibility of the CSW/SAF grades for pompons and other cut flowers (1). A commercial grower graded his pompons according to the above system. He discontinued using these specifications after a six-month period because he thought the larger bunches of ungraded pompons on the market were gaining prices superior to his. However, when graded versus ungraded material was compared on a cents-per-ounce basis, there was a slight market gain for the graded pompons.

Proposed U. S. grades for pompon chrysanthemums were developed soon after the North Central Region (NCR) projects began in 1956 (11). Grades were based on the number of "fairly tight" top flowers per stem, stem number in the pack, and stem length. The numerical values were later altered by the NCR committee, and are as follows (18):

Summary of NCR Grades for Pompon Chrysanthemums

Grade	Min. no. fairly tight top flowers per stem	Minimum stem length: inches
Blue: Extra Fancy	9	30
Red: Fancy	7	25
Green: No. 1	5	20
Yellow: Design	3	15

These grade specifications, along with those for other flower crops, have been developed from investigations into factors determining quality in the crops. The NCR committee, which consists of representatives from a number of state universities in the region, is engaged in both the preliminary investigation and the development of meaningful grades, and their market testing (14). After the grades have been established, i.e., found suited to both crop and market, the information is released to the SAF Grades and Standards Committee which promulgates it in the industry.

In the NCR program, tests were conducted in Wichita, Kansas, on pompon chrysanthemum grades defined by number of stems per bunch, flowers per stem, and flowers per bunch (16). These grades were:

Grade	Number of stems/bunch	Number of flowers/stem	Number of flowers/bunch
Blue	4	8 - 10	32 - 40
Red	6	5 - 7	30 - 42
Green	12	3 - 4	36 - 48

Carpenter (16) worked with one grower and one wholesaler in this test, but he reported difficulty in getting the grower to grade continuously. The grower said that counting flowers was too slow, but that his profits were greater when he stayed with the 40-flower (graded) bunch rather than matching the variable sizes of ungraded bunches in the market place.

Despite the various grading systems recommended for pompons, Seeley (24) stated in 1966 that grading specifications are still in the research stage.

A recent study (2) discovered many different methods used by growers in bunching pompons. These include weight and stem count, display area at the top of the bunch, minimum number of stems, and bud count. A close correlation was found between open flower number and stem weight for the Florida-grown pompons measured in the study.

A survey of a number of retailers in Wisconsin was also conducted (2), and showed a fairly evenly distributed comment for and against the proposed NCR grades. However, many florists believed they were able to make their

purchases by inspection alone (without grading), and felt this enabled them to obtain the best for their money.

As pointed out in the NCR meetings, for example (18), grading will assure both buyer and seller of the content of a bunch. It also reduces transaction time in the market place, so introducing efficiencies for both wholesaler and retailer.

CHAPTER III

MATERIALS AND METHODS

Pompon chrysanthemums¹ were grown in the Plant Science Greenhouses at Michigan State University (MSU) in the summer of 1966. The crop was graded and sold through the Flint Florists' Exchange wholesale market in Flint, Michigan. Marketing began on August 22 and continued for a ten-week period.

Production and Grading²

Two assumptions were made when the crops were planned for the market test of pompon chrysanthemum grades. First, stems developed at the outer edges of the bench produce more flowers per stem than do stems inside the bench and surrounded by other stems. The second assumption was that pompons grown on single stemmed plants have more flowers per stem than those that were pinched. Both assumptions were based on past experience and observations of the crop.

Ten benches were planted at one-week intervals. Rooted cuttings were set at 6" by 6", and after two weeks

¹Rooted cuttings were donated by Yoder Brothers, Inc., Barberton, Ohio.

²Appendix I photographs illustrate the system used for grading the pompon chrysanthemums.

they were soft-pinched and subsequently pruned to three stems per plant. A small portion of the same proposed crop was planted at 6" by 4" two weeks after the 6" by 6" planting, and not pinched. Short days were given to the whole crop five weeks after planting the pinched section, and three weeks after planting the smaller, single stem part of the crop.

Before planting each bench a complete soil analysis was carried out using the Spurway method. Monthly soil checks were run for the major nutrient factors. Fertilizer was applied as necessary. A spray program was initiated, using Isotox at 8 to 14 day intervals.

Cultivars

Four different color cultivars were grown in the approximate proportions that were suggested by the wholesaler to satisfy market demand in late summer and early fall (see next page). Marketing records were taken for all pompons sold, disregarding color differences. The reasons for this were that salesmen were unable to make records of each individual color sold, and it was not considered of sufficient importance in the test with the small numbers that were involved.

Proportions of pompon chrysanthemum cultivars grown at MSU in summer of 1966, for market grading tests.

Cultivar	Percentage to be sold during test:	
	Weeks 1-5	Weeks 6-10
Iceberg (white)	50	40
Dark Yellow Iceberg (yellow)	30	30
Pennant (pink)	5	5
Dillon's Beauregard (bronze)	15	25
	100	100

Grades and Grading

Based on the same quality specifications that were used for the NCR grades [(18) and Appendix III], the grades used in the MSU program are summarized below. An earlier report (17) indicated that only 6 per cent of the marketed pompon chrysanthemums had 9 or more open flowers per stem, so the blue grade minimum was reduced to 7 open flowers. Thus the system differs from that set out by the NCR Committee (page 12).



Grades for pompon chrysanthemums used in 1966 market
grading project at Michigan State University³

Grade	Number open flowers ⁴ per stem (minimum)	Stem length: min. inches	Number of stems/bunch
Blue	7	30	6
Red	5	25	6
Green	3	20	6
Black (ungraded) mixed		20 - 30	6 or more, to give bunch equivalent to standard mar- ket bunch at start of test.

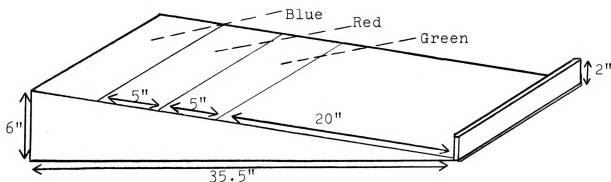
In addition to the three grades in this test, a mixed bunch was sold, with a black label. This gave a closer comparison with market bunches, since the latter are generally mixed, and was made equivalent to the standard market bunch at the start of the test. Quality and content of the black bunch was maintained constant throughout the period, while those of the commercially grown ungraded bunches varied (Chapter IV). Thus the black bunch provided a base from which to set the different price differentials as well as a check on comparative qualities of the graded versus market pompons.

³See also Appendix II.

⁴Open flower is defined here as any flower that has opened to a minimum of a complete circle with all the back petals in one plane, at 90 degrees to the peduncle, and with the center not yet fully developed or opened. A half-open flower was counted as half an open flower; buds were not counted.

A minimum of equipment was necessary to facilitate grading and wrapping the bunches. A grading board, similar to that used for grading roses or carnations, was used. This consisted of a wooden board raised at the upper end, which had a strip of wood across the lower end to form a stop for the cut ends of stems. Colored bands painted on the board indicated the designated grade lengths: green at 20 to 25 inches from the lower end of the board, red from 25 to 30 inches, and blue from 30 inches to the top of the board.

Scale drawing of grading board as used in 1966 market grading project for pompon chrysanthemums at MSU*



Scale: 0.125" represents 1".

*Photograph on page 63.

The procedure for grading the cut pompons of each cultivar was as follows⁵:

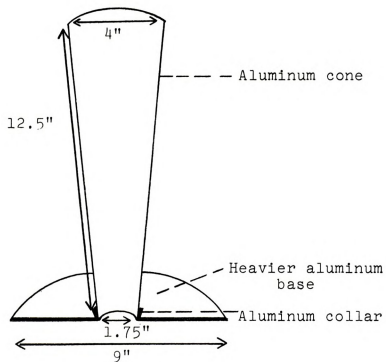
1. Strip stems from about 10 inches above cut end, downwards.

⁵Appendix III.

2. Separate different open flower number groupings--blue, red, green, culls (discarded).
3. Sort into stem length groupings.
4. Bunch into groups of six like stems, using two rubber bands--one at the base (stems were cut to approximately the same length), and one, looser, closer to inflorescences.

The second piece of equipment could be used for wrapping any bunches--graded or ungraded. An aluminum cone was supported at the top of a regular flower bucket by means of the cone's flat base. There was a hole at the narrower (basal) end through which passed the stripped stems of a bunch. The paper wrappers, shaped and glued into cones, were stacked on the outside of the metal cone. A bunch was placed into the cone, stems down, the wrapper drawn up around the flowers, and the bunch removed and replaced in water.

Scale diagram of wrapper cone as used in 1966 market
grading project for pompon chrysanthemums at MSU*.
Longitudinal section.



Scale: 0.25" represents 1"

* Photograph on page 63.

Marketing

Volume

A many as 160 bunches a week were marketed during the test period. The inventory at the Florists' Exchange was maintained with approximately equal numbers of each of the graded and ungraded MSU pompons so that buyers could make any choice. Since this volume was a small percentage of the total pompons sold, market supplies of pompon chrysanthemums from other sources did not have to be altered.

Six retail florists in the Eastern Michigan area were invited to test and evaluate the MSU product. Those bunches that remained in the market after these six retailers had bought what they required were offered on the open market at the same prices as were asked of the participating florists.

Labels

MSU pompon chrysanthemums were labeled FLORALUX, Michigan. The grades were identified by different color printing and a solid color band around the top of the paper wrappers. The minimum number of open flowers per stem, stem length, and stem number per bunch, were stated on each grade wrapper. The black (ungraded) bunch was identified with the same name and a solid black band on the paper, but no grade specifications.

Prior to the test marketing period the six cooperating retailers were informed of the grade specifications to be used, and of the purposes of the test.

Pricing

For the first two weeks of the test the prices were suggested by the wholesaler; they were those estimated to sell approximately equal numbers of each grade. The six participating florists made standing orders for these two weeks in order to become acquainted with the grades being offered. After this time the price differentials between the three color grades (blue, red, green) and the black bunch were varied each week.

It was recommended by the wholesaler that the prices be changed by not more than 25 cents at one time. During the test the prices were varied in such a way as to attempt to duplicate each differential, as well as to arrive at each price from both above and below. However, the market was said to be unwilling to accept the alteration of more than two grades prices at any one time, so a limited range only could be achieved in this test. Even though these two restrictions were applied during this study, the author feels that in future they need not necessarily be followed.

Retailer Opinion

During the final two weeks of the test marketing period each of the six participating retailers was visited. They were requested to indicate their preferences for the grades, and to suggest modifications to the grading system used. Characteristics of the six florists' businesses are discussed on pages 51 to 56.

CHAPTER IV

RESULTS AND DISCUSSION

Production and Grading

As the pompon chrysanthemum crops were cut and graded, a count was made of the number of stems in each grade designation. Although every bench produced different numbers of the grades, some general observations can be made with respect to the two assumptions noted in the preceding chapter. The yields from the pompon crops produced and sorted to grade at MSU indicated that the majority of stems fitted the specifications of the grading system used in this test.

In the majority of cases the single stem portion of the crop lacked sufficient vegetative growth to attain the minimum stem length requirement of the blue grade, although the flower number was good. Some of these were used in the black (mixed) bunches, but many had to be classed as culls since equal numbers of all types were used in the market test. The single stem plants needed more than three weeks of long days, and would probably have been better planted at the same time as the pinched crop and thus given five long-day weeks instead of three.

However, many three-stem plants (more than expected) produced seven or more open flowers per stem, and they were generally long enough to be graded as blue. Owing to the higher light intensity factor, high flower numbers per stem were obtained at the edges of the bench, but these flowers tended to be distributed down one side of the stem. Also, the stems were often shorter than were stems taken from the center of the crop.

Thus, an average of 27 bunches of blue, and 38 each of the red and green grade and black bunches were marketed each week (a total of 141 bunches per week, on average) for the ten weeks of the whole test. These were adequate to maintain equal numbers of every grade available to all potential buyers at the wholesale house.

The remainder of stems from the pinched crops were classified in the red and green grade divisions. The most common discrepancy was lack of stem length, particularly in the unpinched crops.

To provide a comparison with pompon chrysanthemums that had been graded by weight, a sample of each Floralux bunch was weighed (Table 1). The black (mixed) bunch averaged 7.7 ounces, and was between the red and green grades in weight as well as market price in the test. The blue grade had an average weight of 12.4 ounces.

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TABLE 1.--Average weights of MSU-grown pompon chrysanthemum bunches, as graded summer 1966.

BLUE grade:	12.4 ounces
RED grade:	8.2 ounces
GREEN grade:	6.4 ounces
BLACK bunch:	7.7 ounces

TABLE 2.--Average weights of market pompon chrysanthemums from two different sources, and of the same pompons regraded to Floralux specifications, October 1966.

Source A:	average of 40 bunches = 11.2 ounces
Source B:	average of 20 bunches = 13.2 ounces
After regrading,* Floralux graded and mixed bunches:	
BLUE:	average of 13 bunches = 14.0 ounces
RED:	average of 15 bunches = 10.9 ounces
GREEN:	average of 6 bunches = 6.3 ounces
BLACK:	average of 16 bunches = 10.2 ounces

*The total number of regraded bunches from the 60 market bunches was recorded here: i.e., there were fewer Floralux bunches from the original 60. This was due to many very small stems with fewer than 3 open flowers in the lighter market bunches (Source A).

When pompons were purchased and regraded to Floralux specifications in the final weeks of the market test it was found that the MSU-grown pompons were below the average weights, of 11.2 and 13.2 ounces, of those market bunches bought (Table 2). However, the bunches that were regraded were originally priced at about ten cents more than the market equivalent to Floralux black at that time. They were different cultivars than those grown at MSU, and some were grown in California where more vigorous plants were attained than those previously marketed. The same bunches, when regraded, resulted in heavier Floralux bunches which ranged from an average of 14.0 ounces for the blue grade to 6.3 ounces for the green.

This comparison was not intended to imply that the NCR grades should incorporate weight. As stated in the footnote to Table 2, there was a lot of cull material in the so-called better quality¹ market bunches when they were regraded to the test specifications. These stems were of little potential value to a retail florist who, as was found in this study, often preferred the larger sprays. The practice of adding small sprays to fill out the bunch and make it heavier may result in lost customers, and, if all growers continue it, diminishing returns as the market value of the bunches decreases.

¹See page 30.

In 1960 the NCR committee (15) compared NCR grades for carnations with similar CSW grades, and found that more flowers could be sorted into the high grades using the NCR system which specifies stem length and flower diameter. Although a similar study was not carried out for pompon chrysanthemums, the same situation may exist. Much of a spray's weight may be in the stem, but not all large sprays have heavy stems. The lighter stems from pinched crops are usually within the limits for stiffness and straightness (Appendix III).

This was an apparent contradiction to the evidence in Table 2, that fewer Floralux bunches could be sorted from the purchased market bunches. However, the latter were not graded according to the CSW system, and contained many stems too light for that system of grading.

While the grades used in this test were designed with a specified number of stems in each bunch, it is customary to speak about minimum stem number in the bunch. However, the possibility of having a maximum stem number limit should also be considered since growers tend to pack ever-increasing bunch sizes.

Marketing

Table 3 shows the prices and price differentials between Floralux grades and the market equivalent (black) during the entire ten weeks of the study. Tables 4

through 7 exclude or separate the first two weeks from the last eight. During the first two weeks prices and orders to the participating florists were fixed so that they could become acquainted with all groups in the market test. In the last eight weeks both factors varied.

Prices of the blue Floralux grade (Table 3) varied from \$1.25 to \$1.75, or from 25 to 75 cents above the black bunch (market equivalent) price. Those for the red and green grades varied less than the blue prices. The red was never more than 35 cents above, and the green 50 cents below the market equivalent. Little variation was achieved because of the restrictions imposed (page 23) and the brief duration of the test.

There was an increase in the apparent quality, as measured subjectively and by bunch weights, of the commercially marketed pompon chrysanthemums (i.e., those competing with the Floralux bunches) during the ten weeks in which Floralux pompons were being sold. While this apparent quality of the commercial material became better, that of Floralux graded and ungraded pompons remained approximately the same.

During the final weeks of the study there was less demand for any pompon chrysanthemums while supplies were increasing in quantity and quality. This market condition of excess supply is termed "sluggish" or "glutted."

TABLE 3.--Prices charged for Floralux pompon chrysanthemums in Flint Florists' Exchange during ten weeks, August 22 through October 29, 1966; average market prices and differentials between graded and ungraded Floralux bunches.

Week ending	Test week no.	Prices charged for Floralux pompons.			Flint average price*	Differentials between color grades & black		
		BLUE	RED	GREEN		BLUE	RED	GREEN
Aug 27		\$ 1.50	1.25	0.75	1.25	+ .25	0	- .50
Sept 3		\$ 1.50	1.25	0.75	1.25	+ .25	0	- .50
Sept 10	1	\$ 1.50	1.25	0.50	1.10	+ .50	+ .25	- .50
Sept 17	2	\$ 1.65	1.25	0.75	1.00	+ .65	+ .25	- .25
Sept 24	3	\$ 1.65	1.00	0.75	1.00	+ .65	0	- .25
Oct 1	4	\$ 1.75	1.00	0.90	1.00	+ .75	0	- .10
Oct 8	5	\$ 1.75	1.25	0.90	1.00	+ .75	+ .25	- .10
Oct 15	6	\$ 1.50	1.25	1.00	1.00	+ .50	+ .25	0
Oct 22	7	\$ 1.25	1.25	0.75	1.00	+ .25	+ .25	- .25
Oct 29	8	\$ 1.40	1.25	0.65	0.90	+ .50	+ .35	- .25

*Flint average price = price of market bunch comparable in content and quality to the Floralux black (ungraded) bunch.

The total pompon chrysanthemum sales data in Tables 4 and 5 were available bi-weekly from the Flint Florists' Exchange. Weekly figures for sales to the six florist sample were obtained. Thus, in Table 4, in weeks 1 and 2, these retailers purchased 18 per cent of the total for that period. Of this, 31 and 49 per cent were Floralux pompons in the respective weeks. Their pompon purchases dropped throughout the period being examined, from 341 bunches in week 1 to 187 bunches in week 8. While their share of total pompon sales also declined to about 9 per cent, the proportions of Floralux sales to the six retailers increased from 31 to 66 per cent in weeks 1 through 3, then decreased to 38 per cent in week 6. These changes resulted from the variation in Floralux prices.

The six cooperating retailers completely stopped buying the Floralux pompons in the seventh week. This was the time at which the relative quality of the competing pompon chrysanthemums appeared better, even though some commercially grown material was used in the last two weeks (mainly in week 8): smaller and lighter Floralux grades resulted from the market grades (see Table 2). The "better" quality of competing pompons, together with the florists' reduced requirements for that flower, may have contributed to their lack of response in weeks 7 and 8. In view of the sales and interview results reported later

TABLE 4.--Percentage of total pompon chrysanthemum sales through Flint wholesaler taken by six retail florists: sales and percentage of Floralux pompons to this sample of florists during eight weeks of price variation, summer 1966.

Week no.	Week ending	I		II		III		IV	
		Total no. pompons sold by a wholesaler ^a	Total no. pompons sold to sample ^b	Total no. pompons sold to sample ^b	Percentage of total bought by sample	Percentage of total bought by sample	Total Floralux sold to sample	No.	Pct.col.II
1	Sept 10		341					107	31.38
2	Sept 17	3171	237		18.23			117	49.37
3	Sept 24		233					155	66.52
4	Oct 1	3906	234		11.96			118	50.43
5	Oct 8		302					119	39.40
6	Oct 15	4221	184		11.51			70	38.04
7	Oct 22		140					0	0
8	Oct 29	3733	187		8.76			2	1.07

^aRecords of total pompon chrysanthemum sales were available bi-weekly.

^bIncluding Floralux pompons with commercial pompon chrysanthemums.

TABLE 5.--Percentage of total pompon chrysanthemum sales through Flint wholesaler occupied by total sales of Floralux pompons during eight weeks of price variation, summer 1966.

Week no.	Week ending	I Total no. pompons sold by wholesaler*	II Total Floralux pompons sold	
			No.	Pct.col.I
1	Sept 10		139	
2	Sept 17	3171	133	8.58
3	Sept 24		178	
4	Oct 1	3906	142	8.19
5	Oct 8		143	
6	Oct 15	4221	111	6.02
7	Oct 22		78	
8	Oct 29	3733	16	2.52

*Records of total pompon chrysanthemum sales were available bi-weekly.



in this chapter, it is doubted whether this indicates a total rejection of the grades.

For similar reasons the total number of Floralux pompon chrysanthemums sold in the last two weeks of the test was considerably less than in previous weeks (Table 5). The percentage of Floralux in all pompon sales was reduced from 6, in weeks 5 and 6, to 2.5 per cent in weeks 7 and 8. The total market sales of pompons were lower by about 500 bunches in the last two weeks than earlier in the test period.

The observations of Floralux bunch sales in the eighth week indicated that few buyers were involved (three only). Data for weeks 7 and 8 of the price variation time have been omitted from the tables and subsequent analyses of all Floralux sales.

Data have been separated into two groups: one is of sales to the participating florists (the sample), and the other is total Floralux sales which include the six florist sample and all other purchasers of these pompons. Table 6 refers to sales to the six retailers, and Table 7 to total sales of Floralux pompon chrysanthemums.

Tables 6 and 7 indicate the numbers and percentages of Floralux bunches sold during the weeks of price variation. As the price of the blue grade increased from \$1.50 to \$1.75, the total number of blue grade bunches sold dropped from 37 in week 1 to 8 in week 5 of the

TABLE 6.--Sales of Floralux graded and ungraded pompon chrysanthemums to six retail florists during six weeks of price variation, summer 1966; percentage of each group to total number of Floralux pompon chrysanthemums sold.

Week no.	Week ending	Total number sold	BLUE		RED		GREEN		BLACK	
			No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
1	Sept 10	107	30	28.0	30	28.0	30	28.0	17	15.9
2	Sept 17	117	28	23.9	31	26.5	32	27.4	26	22.2
3	Sept 24	155	26	16.8	48	31.0	40	25.8	41	26.5
4	Oct 1	118	19	16.1	34	28.8	32	27.1	33	28.0
5	Oct 8	119	7	5.9	34	28.6	36	30.3	42	35.3
6	Oct 15	70	21	30.0	20	28.6	18	25.7	11	15.7

TABLE 7.--Total sales of Floralux graded and ungraded pompon chrysanthemums through Flint Florists' Exchange during six weeks of price variation, summer 1966; percentage of each group to total number of Floralux pompon chrysanthemums sold.

Week no.	Week ending	Total number sold	BLUE		RED		GREEN		BLACK	
			No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
1	Sept 10	139	37	26.6	37	26.6	40	28.8	25	18.0
2	Sept 17	133	28	21.1	37	27.8	38	28.6	30	22.6
3	Sept 24	178	27	15.2	55	30.9	49	27.5	47	26.4
4	Oct 1	142	20	14.1	42	29.6	38	26.8	42	29.6
5	Oct 8	143	8	5.6	44	30.8	40	28.0	51	35.7
6	Oct 15	111	31	27.9	33	29.7	26	23.4	21	18.9

test (Table 7). Similarly there was a reduction in sales of the blue grade to the six florist sample in weeks 1 through 5 (Table 6).

In week 3 the price of the red grade was reduced from \$1.25 to \$1.00, and its sales to the retailer sample increased from 31 to 48 bunches in weeks 2 and 3. Total sales of the red grade bunches rose from 37 to 55 in the same two weeks. Although in week 4, when the red price was still \$1.00, the sales of that grade decreased to 32 bunches (sample) and 38 bunches (total Floralux sales), the percentages that red grade purchases were of all Floralux group sales were about the same in both weeks; approximately 29 per cent in each case.

Sales of the green grade Floralux pompon chrysanthemums were unrelated to its prices during the test.

Proportions of the three color grades remained within about 15 percentage points throughout the test, except for week 5. Here the price for blue was unchanged from that in the previous week, \$1.75; the green grade price was also steady at 90 cents. However, red increased from \$1.00 to \$1.25, and the retailers bought more black (mixed) bunches at the expense of the blue grade. The proportions of reds and greens were about the same. With a decrease in blue grade price the following week, sales of blue grade pompons increased from about 5 to 30 per cent of

the sample retailers' purchases, and to nearly 28 per cent of all Floralux sales (Tables 6 and 7).

Demand for Floralux Grades

Demand relationships are usually shown using the prices that were asked for goods and the actual number sold at each price. The number of each MSU group purchased in any week of the test depended on the relative prices at the time. The use of price differentials or ratios rather than absolute prices will lead to a better measure of market demand for each grade; therefore price differentials and ratios both have been used in the analyses.

The Floralux pompons were also in direct competition with all other pompon chrysanthemums on the market. The proportion of Floralux pompons in total pompons sold declined (Tables 4 and 5) in the later weeks. In order to abstract from this reduction in numbers and consider only the relative demand for each of the four test bunches, the percentage of each Floralux group (graded or ungraded) to the total Floralux sales has been utilized.

Multiple regression analyses were run with percentage sales of each Floralux grade and the black bunch as the variable dependent upon either the price differentials between that group and each of the other Floralux

bunches or the ratios of the same prices. Using functional notation, the analyses solved:

$$\left(\frac{\text{Grade 1 sales}}{\text{Total Floralux sales}} \right) \% = f(P_1 - P_2, P_1 - P_3, P_1 - P_4),$$

$$\text{OR } f(P_1/P_2, P_1/P_3, P_1/P_4),$$

where f = multiple regression coefficient,

P_1 = price of grade 1,

P_2 = price of grade 2,

P_3 = price of grade 3, and

P_4 = price of grade 4.

(Note: black bunch treated as a grade for easy notation.)

Since the weekly sales to the six participating florists gave only 2 degrees of freedom ($n - 4$) in the analysis, weekly sales data for individual florists were used (Appendix IV).

Two separate analyses were made. The first one considered all individual retailers' reactions to price changes of the groups, even if they bought no Floralux pompons in a week. The highest percentage of variability in the proportion of sales of one Floralux group that was attributable to regression on its price differentials or ratios with the other groups (R^2 value) was only 20. With random variability of 80 per cent or more, the results cannot be cited as significant. The residuals

(deviations of expected values from those observed) were high, and were largely due to the presence of zero observations in a number of cases. The lack of distinct market reaction to price changes of the red and green grades, in the range of prices used, also contributed to the non-significance of these multiple regression analyses.

The second analysis included observations on retailers who bought at least some Floralux pompons in a week but omitted those where a retailer bought none in the week. While all multiple correlation coefficients again were not significantly different from zero, the highest R^2 value of 23 per cent was found for the equation relating to percentage sales of the blue grade (Table 8). For example, the correlation of percentage blue grade sales (Y) with its price differentials over all other Floralux groups,

$$Y = 68.35 - 54.14x_1 - 10.76x_2 - 8.55x_3,$$

where

x_1 = blue - black price differential,

x_2 = blue - red price differential, and

x_3 = blue - green price differential.

All regression coefficients for this variable were negative values, indicating reduced purchases of the blue grade as its price was increased relative to all other Floralux bunch prices. This trend was observed in the raw data (page 37).

The slight differences observed between values for the price differential data and those for price ratio data

were probably due to the low percentage of variation attributable to regression on the independent variables. Conversely, the high percentage of chance rendered the values less consistent.

These analyses show a little indication of the market differentiation for the grades used in the test: i.e., the blue grade seemed the most distinctly differentiated of the three. Further studies with more observations may give more evidence which will confirm or refute the hypothesis that these grades and the mixed bunch are considered different from each other by retailers.

Market Acceptance of MSU Graded
Versus Ungraded Pompon
Chrysanthemums

Some indication of whether the market as a whole, and in particular the florists who participated in this study, were in favor of grading to these specifications may be obtained by studying the change in purchases over time. Using data from the six weeks of price variation found relevant (page 34), percentages of the three color grades to total Floralux sales were computed (Table 8).

In the first part of the table the sales to the six-florist sample were considered. The percentage of black bunch sales increased from approximately 16 to 35 during the first five weeks; this may be correlated with the increasing price for the blue grade. Likewise the decrease

TABLE 8.--Percentages of Floralux graded pompon chrysanthemums of total (graded and ungraded) Floralux pompons sold during six week of price variation, summer 1966.

Week no.	Numbers of each Floralux group sold					Percentage GRADED (B,R,G)	Percentage UNGRADED (Black)
	Blue	Red	Green	Black	TOTAL		
a. Sales to six-retailer sample:							
1	30	30	30	17	107	84.1	15.9
2	28	31	32	26	117	77.8	22.2
3	26	48	40	41	155	72.6	27.4
4	19	34	32	33	118	72.0	28.0
5	7	34	36	42	119	64.7	35.3
6	21	20	18	11	70	84.3	15.7
b. Total Floralux sales:							
1	37	37	40	25	139	82.0	18.0
2	28	37	38	30	133	77.4	22.6
3	27	55	49	47	178	73.6	26.4
4	20	42	38	42	142	70.4	29.6
5	8	44	40	51	143	64.3	35.7
6	31	33	26	21	111	81.1	18.9

in proportion of black bunch sales can be compared with the decrease in blue grade price. The total percentage of three color grade sales was between 72 and 84, except in week 5 when blue grade sales were very low and its price high.

A similar trend occurred in the percentage data for total Floralux sales (Table 8b). These data indicated market response to price increases for the graded bunches. The retailer interviews showed the blue grade as being most acceptable. Florists were also most sensitive to blue grade prices, with price thresholds at \$1.50 or \$1.75 for different individuals.

Changes in relative quality of the Floralux pompon chrysanthemums during later weeks of the study may have affected the proportions of grades purchased. No conclusion about acceptability of the grades can be reached from this data alone.

Financial Gains from Grading

The weekly reported prices for pompon chrysanthemums in three Midwestern wholesale markets (Milwaukee, Wisconsin; Chicago, Illinois; and Detroit, Michigan) since 1964 were examined (10), and the following observations were made.

Price spreads and fluctuations in the Detroit market were considerably less than those in Milwaukee and Chicago. There seemed to be no consistent seasonal price fluctuation:

for example, Christmas and Mother's Day (December and May). This was probably because pompon chrysanthemums are in demand all year round for funeral arrangements and weddings, which together comprise up to 85 per cent of a retail florist's business (8, 9). Furthermore, pompons cannot generally be classed as gift flowers as can roses and carnations, so there may be little if any real increase in demand for pompons at these peak seasons of the sale of all flowers. Alternatively, producers consistently matched the seasonal demand fluctuations with supplies.

Variation in demand for pompon chrysanthemums are due to local, individual situations--an extra large wedding, for example--which should not have affected these central markets.

These considerations do not account for the large and rapid changes that were seen occasionally in all markets. The fluctuations may have been due to supply and quality changes rather than to demand changes. A wide area is served by each market; therefore individual demand alterations would tend to balance one another.

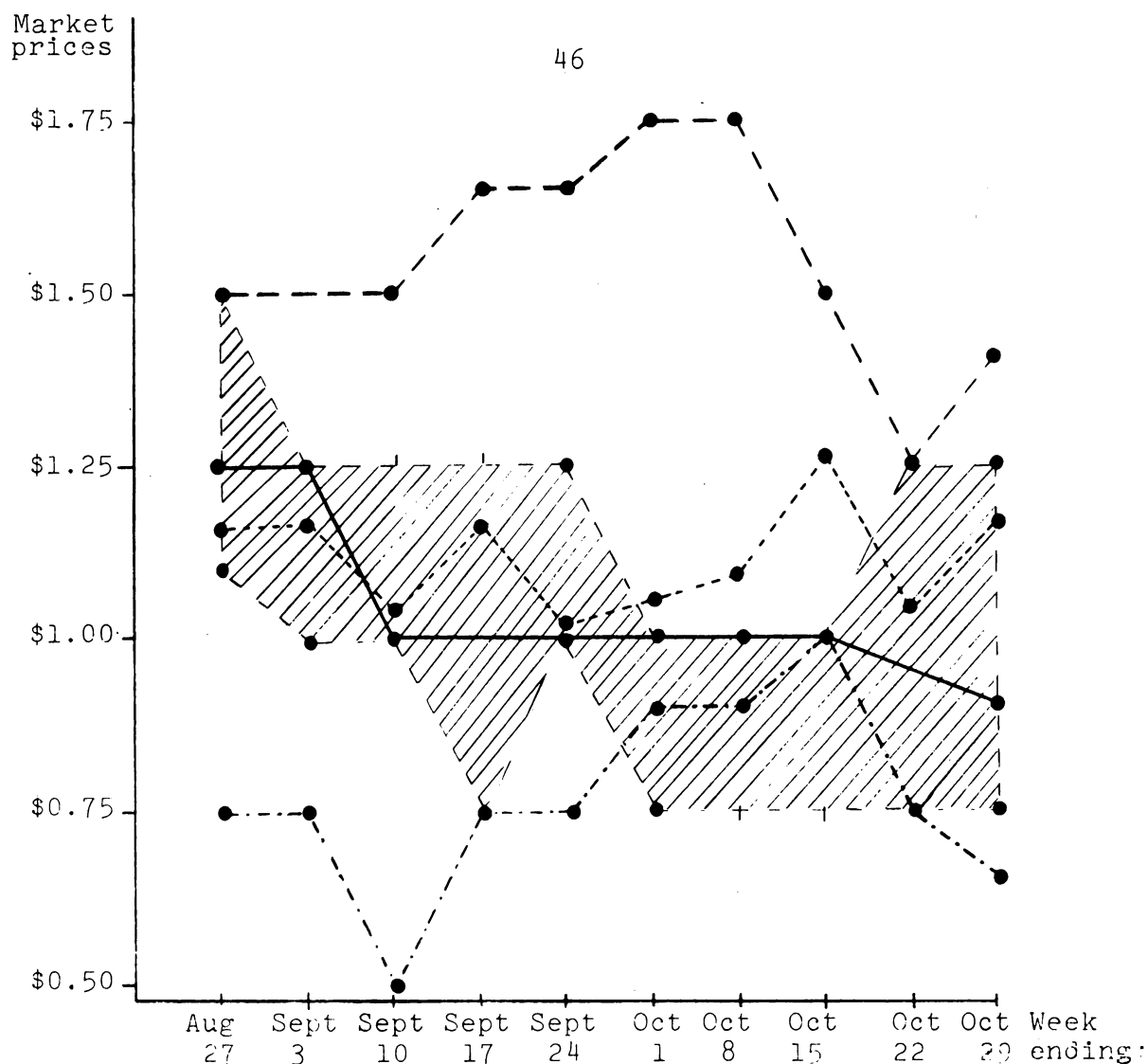
The average price per bunch during the summer of 1966 in the Detroit market varied by as much as 25 cents from one week to another. This may not seem large compared with the 50 and 75 cent changes that were found in the other two markets, but the retailer has charged from

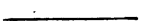
50 cents to one dollar more per bunch for the same quality flowers in the weeks when prices were high (assuming similar supplies throughout). As an example, for a bunch containing seven stems, about 10 cents more per stem at retail results from such increases in wholesale prices. If the retailer were to maintain consistent prices in order to retain his buyers' confidence, then prices would either be higher than necessary at some times, or quality would fluctuate if market prices are a reflection of quality.

While standard grading will not iron out price fluctuations caused by changes in demand, it will give both buyers and sellers a knowledge of bunch content so that a hierarchy of prices can be created. Market prices could then reflect both quality and retailer differential demand (if any) for the various grades.

Figure 1 illustrates the comparative prices in the Detroit and Flint markets, the high and low (blue and green grades) Floralux prices, and the weighted average price² for sales of all three Floralux grades in the ten weeks of the MSU pompon chrysanthemum grading study. After the first two weeks the weighted average Floralux price rose

²Weighted average price = total revenue from sales of blue, red, and green Floralux grades divided by total number of blue, red, and green bunches sold each week.



Key:  Reported Detroit Price range (9)
 Flint market equivalent^b price
 Weighted^a average of Floralux grade prices
 Price of Blue grade
 Price of Green grade

^aWeighted average = total revenue from sales of blue, red, and green Floralux grades divided by total number of blue, red, and green bunches sold, by week.

^bMarket equivalent = price of black grade, which was equivalent to standard market bunch at start of the study.

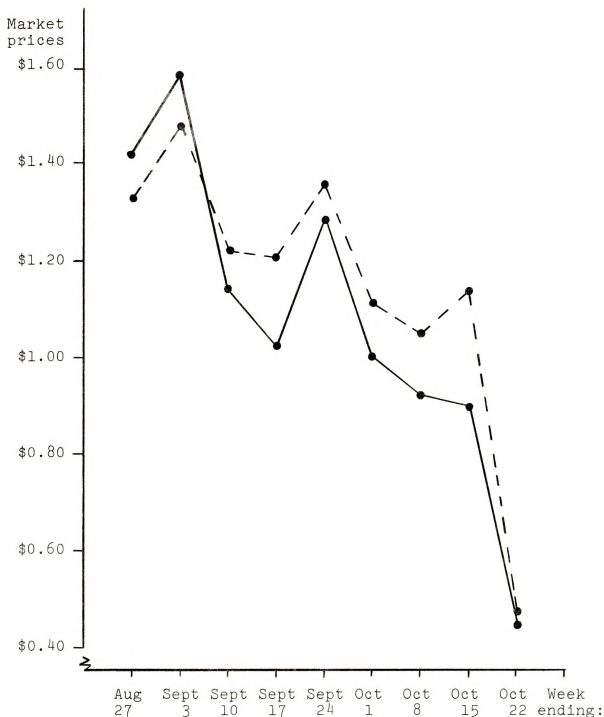
Figure 1.--Pompon chrysanthemum prices in Detroit and Flint wholesale markets: including Flint market equivalent^b and Floralux grade prices; weeks ending August 27 to October 29, 1966.

above the Flint market equivalent and the Detroit unweighted average (not shown in Figure 1). In the first three weeks of October, it was from 10 to 25 cents greater than the higher reported Detroit price.

Figure 2 and Table 9 show the income received from sales of the graded pompon chrysanthemums compared with that from the same number of bunches that might have been sold at the black (ungraded) bunch price if all bunches had been so mixed. In the first two weeks of the test, when prices and orders were fixed, the graded pompons "lost" almost 7 per cent of the income they might have returned had they all been sold under the black label. However, when prices were changed weekly and varying numbers of each grade were sold as a result, gains of up to 26 per cent were realized. The greatest gain was in week 6.

Retailer Opinion

Personal visits were made to each of the six participating retail florists toward the end of the test marketing period. Some opinions were gained through the wholesale salesmen prior to this time. The interviews were mainly unstructured with no written questionnaire used, so that the maximum chance was taken of obtaining real opinions rather than what each retailer thought was expected of him. However, standard questions were raised for all retailers.



Key: ——— Income, all bunches at black price
 - - - - - Income actually received for graded pompons

Figure 2.--Income received from sales of Floralex grades compared with that from the same number of bunches sold at prevailing black (ungraded) prices, weeks ending August 27 to October 22, 1966.

TABLE 9.--Income gained or lost (+ or -) by grading pompon chrysanthemums into three groups compared with potential income with all mixed bunches (black).

Week no.	Week ending	Price of BLACK (ungraded)	Total no. GRADED bunches sold	Income, all at BLACK price	Income actually received	Percentage gain/loss (+ or -)
	Aug 27	\$1.25	114	\$142.50	\$132.75	(two weeks) - 6.8
	Sept 3	\$1.25	127	\$158.25	\$148.00	
1	Sept 10	\$1.00	114	\$114.00	\$121.75	+ 6.8
2	Sept 17	\$1.00	103	\$103.00	\$120.95	+17.4
3	Sept 24	\$1.00	131	\$131.00	\$136.30	+ 4.1
4	Oct 1	\$1.00	100	\$100.00	\$111.20	+11.2
5	Oct 8	\$1.00	92	\$ 92.00	\$105.00	+14.1
6	Oct 15	\$1.00	90	\$ 90.00	\$113.75	+26.4
7	Oct 22	\$1.00	44	\$ 44.00	\$ 47.00	+15.9

The location of each florist was sufficiently different, both geographically and in type of business, that there was little if any competition between them. The sample was selected as being representative of the most progressive florists among the Florists' Exchange customers.³

The sample retailers purchased between 8.8 and 18.2 per cent of all pompon chrysanthemums sold through the Florists' Exchange during the weeks of the study (Table 4). The reduction in their purchases in the final two weeks was due in part to the availability of some other sources of pompons as well as to the glutted condition of the market at that time.

The overall proportion of Floralux bunches to the total number of pompons bought by all sample retailers ranged from 31.4 to 66.5 per cent. Individuals participated to greater or lesser degrees, as is described in the following pages.

A brief examination of the physical location and estimated trading characteristics⁴ was carried out during

³This makes the sample biased. However, the acceptance of grades by the relatively forward-looking members of the industry was sought, since these individuals are concerned with the whole industry. Those chosen were estimated as being most likely to try out innovations.

⁴Trading characteristic = type of business constituting the major portion of income: e.g., hospital, funeral, decoration, mixed.

the interviews. Each retailer will be discussed, and the summary of main responses to several questions is in Table 10. Code numbers were used to identify the individual retailers. Purchasing data are shown in Appendix IV.

Interviews

No. 1.--The retail flower store was located close to two large hospitals and a cemetery, in a city with a population of 50,000. The florist's estimated cash-and-carry sales were 25 per cent of his dollar volume, and many such sales went to the hospitals and cemetery.

Although none of the Floralux grades was used for any one specific purpose, the florist stated a preference for the pre-knowledge of what each bunch contained. He recommended a two-grade rather than the three-grade system used in the test. It was easier to work to a given price and to put a price on completed work with the differential prices.

The florist was growing one bench of pompon chrysanthemums at the time of the test, and he bought an average of 18 bunches a week from the Flint wholesaler during the six weeks that are being considered. In three out of these six weeks the purchased bunches were entirely Floralux grades, and included some of every grade offered.



TABLE 10.--Summary of responses to standard questions put to six retail florists regarding pompon chrysanthemum grading and the Floralux grades marketed in summer of 1966.

Question	Retailer					
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Did you find it useful to buy all large, medium, or small stems in one bunch?	Yes	No	Yes	Yes	Yes--for retail trade	Yes
How did you use each grade?						
Blue	Mixed	Mixed	Mixed	Arrgmts.	Mixed	Arrgmts.
Red	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed
Green	Mixed	Mixed	Arrgmts.	Mixed	Mixed	Mixed
Which grade was most useful in your business?	None	None	None stated	Blue	None	Blue
If not these 3 grades, how many would you like in the market?	2	None	2	No views	No change	No change
Did you find you had less wastage with graded pompons than normally?	Very little	No	No	No	No	No
How well does the florist seem to consider standard grading worthwhile and useful:*						
in his business?	2	4	3	2	1	2
for flowers other than pompons?	2	3	2	2	2	2
to the industry in general?	2	3	2	2	2	2

*A five-point code was used for these impressions gained by the interviewer:
1 = very, 2 = quite, 3 = neutral, 4 = not very, 5 = not at all worthwhile or useful.

A specific recommendation for improving the grades was to increase the number of stems in the green grade bunch, and to have only two grades available.

No. 2.--This gentleman owned two florist shops in a city of 100,000. The shop selected for the test was not in the downtown area but was close to five hospitals. Most of the business was in making small arrangements for hospital patients, with only 15 per cent of the dollar volume being the estimated in-store (cash-and-carry) trade.

The Floralux grades were not received well because the florist preferred a variety of stem sizes in each bunch. Of the graded bunches, he did state a preference for the blue grade, even though each week he bought some of all types. The average number of pompon chrysanthemum bunches handled per week by both branches of the business was 90. During the six weeks of the test the proportion of Floralux grades ranged from 15 to 50 per cent. The florist used the different grades' contents for all purposes in designing.

No. 3.--The shop was located on a main road leading to the center of town, and was close to a large cemetery. The town's population was 20,000, and the florist reported that the majority of his business was in funeral work. However, no estimate was offered as to the proportion of each type of trade.

Early in the test period the florist reported that he liked the grades, with particular reference to the green bunch which was useful for making up inexpensive arrangements. He used all grades for a variety of purposes, but the different prices made easier calculations for the designers. The blue grade was considered too costly even at \$1.50, and he stopped buying it in the third week when the price increased to \$1.65. With an average of 27 bunches of pompon chrysanthemums bought each week from the wholesale house, between 56.6 and 100 per cent of these were Floralux grades.

No. 4.--Located in an older residential area of the same town as florist number 3, this flower shop had a greatly different trading characteristic from that of the former one. Much of the dollar volume was involved with flower decoration for parties and meetings.

When asked about the Floralux grades, the florist stated a definite preference for the blue grade, for use in table center arrangements. However, at times the price seemed too high, particularly when it was more than \$1.50. He did not buy any blue grade when it was priced \$1.75, although for a special decoration was willing to pay \$1.65. The larger sprays of the white, yellow, and pink cultivars have longer peduncles supporting the individual flowers (inflorescences) than do small sprays, and they

can therefore be more usefully broken up for arrangements.⁵ The bronze cultivar (Dillon's Beauregard) was not satisfactory because of the short peduncles regardless of spray size.

The florist would prefer to handle fewer larger bunches, and therefore the green grade was considered too small.

He had no specific recommendations to make for improving the grade specifications. During the test period this florist purchased an average of 18 bunches of pompon chrysanthemums a week, with between 48 and 100 per cent of these being the Floralux grades.

No. 5.--This retail flower shop was located on a main road in the suburbs of a city with a population of 160,000. There was an adequate parking area and the florist estimated that some 10 per cent of his dollar volume was cash-and-carry.

The only use that he could ascertain for the graded pompon chrysanthemums was in the price differentials for retail sales. He was enthusiastic about grades, and stated that if growers could reap better returns by grading their pompons, the retailers would welcome it since they too could have increased returns.

⁵However, when flowers per spray are further increased through culture and breeding, multi-crowned sprays with shorter peduncles result. This is an argument against weight grading without the use of flower count.

In the six weeks being studied this florist purchased an average of 77 bunches of pompons a week from the Florists' Exchange in Flint. Between 30 and 71 per cent of these were Floralux bunches.

No. 6.--The final flower shop visited was on a wide and busy main road, a part of a town with population 25,000. There was a greenhouse attached to the shop in which much of the cut chrysanthemum requirement was produced. However, the florist still purchased an average of 20 bunches of pompons a week from the wholesale house. His orders for Floralux grades, which were during the first three weeks only, were not consistent.

Like florist number 5, this retailer would be more enthusiastic about using grades if growers could make more money by grading; but he considered it unfeasible for them. The blue grade was used mainly for table decorations, and this was the grade he said he would have bought throughout the test had not the price increased.

CHAPTER V

SUMMARY AND CONCLUSIONS

A flower grading economics study was designed to test the market potential for graded pompon chrysanthemums. In the summer of 1966, at MSU, ten weekly crops of pompons were grown and graded to three standard grades designated by minimum stem length and open flower count, with an additional mixed group. These were marketed through the Florists' Exchange in Flint, Michigan, under the label of FLORALUX, Michigan.

Observations while the pompon crops were grown and sorted to the grade specifications were made, to estimate their practicability in the commercial operation.

After the retail florists were given a two-week period in which to become acquainted with the Floralux groups, the prices for the different grades were varied each week for eight weeks, and the sales data recorded. Sales to six florists who cooperated in testing the grades for their acceptability and usefulness were analyzed separately as well as amongst the total sales data for Floralux pompons. Multiple correlation relationships were computed for each grade, based on the percentage sold of that grade to the participating retailers and both its

price differentials and its price ratios with every other Floralux group. Total returns for the Floralux pompon chrysanthemums were compared with the potential returns of all bunches sold at the equivalent market price.

Each of the six participating retailers was interviewed regarding grading and the grades used in this test. Their usage of the various grades was noted, and the grades re-evaluated on the basis of the retailers' experiences and opinions.

The results provided a basis for answering the four questions posed at the start of this study:

1. Is the grading acceptable to the flower industry? The percentage sales of graded versus ungraded pompons give no conclusive evidence for or against the market acceptance of grades. This was probably due to quality increases perceived in the competing ungraded pompons, and the decreasing demand at the end of the test. However, five of the six retailers interviewed stated they were in favor of grading.

An affirmative answer to question number 2 will strengthen the qualitative evidence for market acceptance noted here.

2. Will grading pay? Market return comparisons show good evidence that higher returns can be obtained by the grower who sells graded pompons, even though a lower



proportion of the larger more expensive grades are sold when prices vary beyond threshold prices.

It is not clear from the evidence of this study whether the retailer would also gain by the use of graded rather than ungraded material. One of those interviewed stated that he could, and the interest from others indicated that there would be some gain in operational efficiency.

3. What grades are desired by the market? Two out of the six florists mentioned the blue grade as that being most useful to them in their businesses. A third liked the green grade for small inexpensive arrangements, and another found the price differences between grades useful for retail sales of the bunches. Opinion was divided over the question of how many grades there should be in the market, with some recommending two and others, three. Different florists will hold differing views on this, according to their various types of business. The market (retailers) appeared unable to specify exactly the grades desired, though most responses indicated that the smallest (green) grade was too small and probably unnecessary (despite the fact that one retailer liked it).

4. What price differentials will the market pay for different grades? The blue grade seemed to be that which was best differentiated from the black (ungraded) bunch.

A price threshold for this grade was reached, with cut-off point for some buyers at \$1.50, or 50 cents above the market equivalent price.

The price variations of the red and green grades did not cover the entire range of those acceptable to the market, and consequently no thresholds were seen. However, sales of the red grade showed a tendency to increase as its price was lowered relative to that of the market equivalent, even though no cut-off point at the high differential was seen.

Interview responses strengthen the evidence that buyers were sensitive to the price of the blue grade relative to the other grades offered.

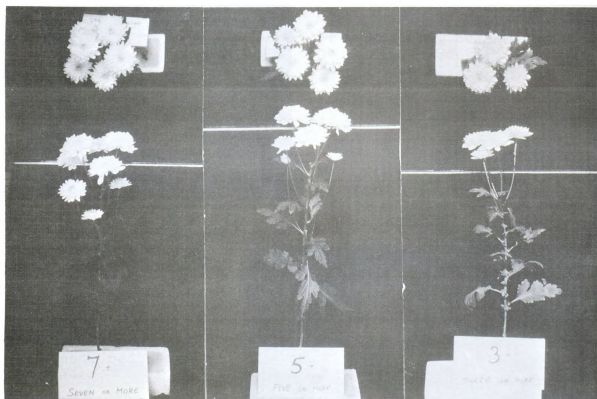
The evidence obtained in this preliminary market study of pompon chrysanthemum grades indicates that they would be generally acceptable in the market. Further study is required to determine exact grade specifications and the long-run market acceptance and reaction.

APPENDIX I

PLATE I.--Minimum open flower count used in Floralux grades for pompon chrysanthemums.

These photographs were taken from a side view of three pompon stems representing the different grade designations by open flower count. A mirror suspended at 45 degrees above the spray affords the simultaneous top view of each stem.

Grades by open flower count:



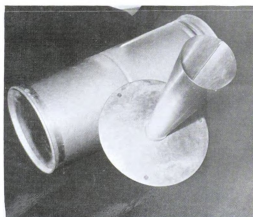
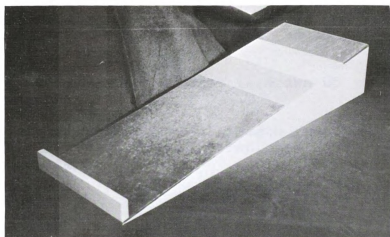
BLUE

RED

GREEN

PLATE II.--Grading board, wrapping cone, and wrappers used in pompon chrysanthemum grading test.

- a. Grading board,
described on
page 19.



- b. Wrapping cone with
flower bucket,
pages 20-21.

- c. Printed labels:
l. to r.--black,
green, red, blue
grades.

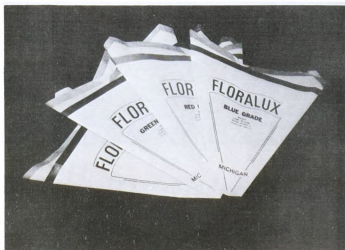


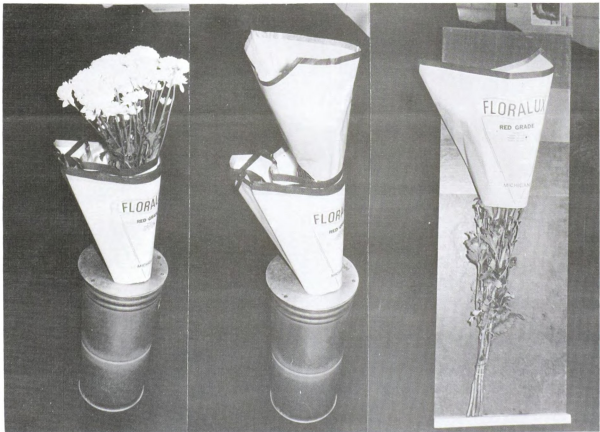
PLATE III.--Stages in wrapping pompon chrysanthemum bunch.

- a. Cone with paper flower wrappers, on flower bucket; bunch placed inside cone.
- b. Wrapper from inside of bundle on cone is drawn up around the flowers.
- c. Completed bunch demonstrates correct length for the red grade--flower level is midway on red band (center color) on board.

a.

b.

c.



APPENDIX II



Grades for Pompon Chrysanthemums

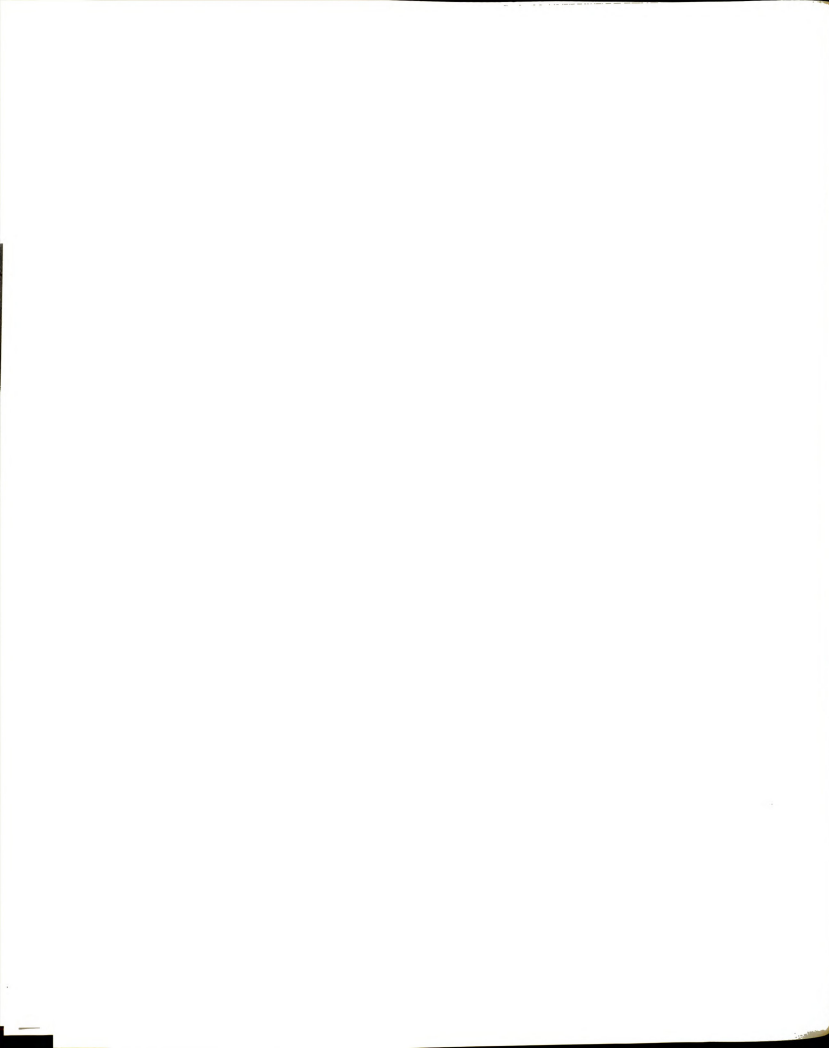
It had been planned originally that the three Floralux grades should each have approximately the same number of flowers, but different stem lengths and flowers per stem. Grades were set up as follows:

Grade	Minimum number open flowers per stem	Minimum stem length: inches	Number of stems/bunch
Blue	7	30	6
Red	5	25	9
Green	3	20	12
Black	Mixed	20 - 30	Variable

Before the main crop was marketed some trial bunches were made up and demonstrated in the Flint Florists' Exchange, early in August, 1966. Quality appeared excellent by comparison with the present market pompon chrysanthemums, and the flower count was well above that found in other market bunches. For example, a Canadian bunch contained 5 stems and 28 open flowers, using the system for the flower count as described on page 19, footnote 5, of this thesis; a Californian bunch consisted of 6 stems and 39 open flowers, which was closer to the Floralux bunch content. It was felt at that time that there was not sufficient visual difference between the three Floralux grades to warrant a price variation. Mr.

Schneider recommended strongly that the same number of stems be placed in each grade bunch, thus reducing the open flower count in the red and green bunches. The seller could then more easily demonstrate the differences between the grades. The underlying assumption here is that buyers look first at the flowers and secondly at stem number when purchasing pompon chrysanthemums by sight. The flower count and appearance is more important to buyers than stem number, provided the stem count is not extremely low. This would indicate a multi-crowned inflorescence form with short peduncles. A very high stem count indicates many weak stems in the bunch.

APPENDIX III



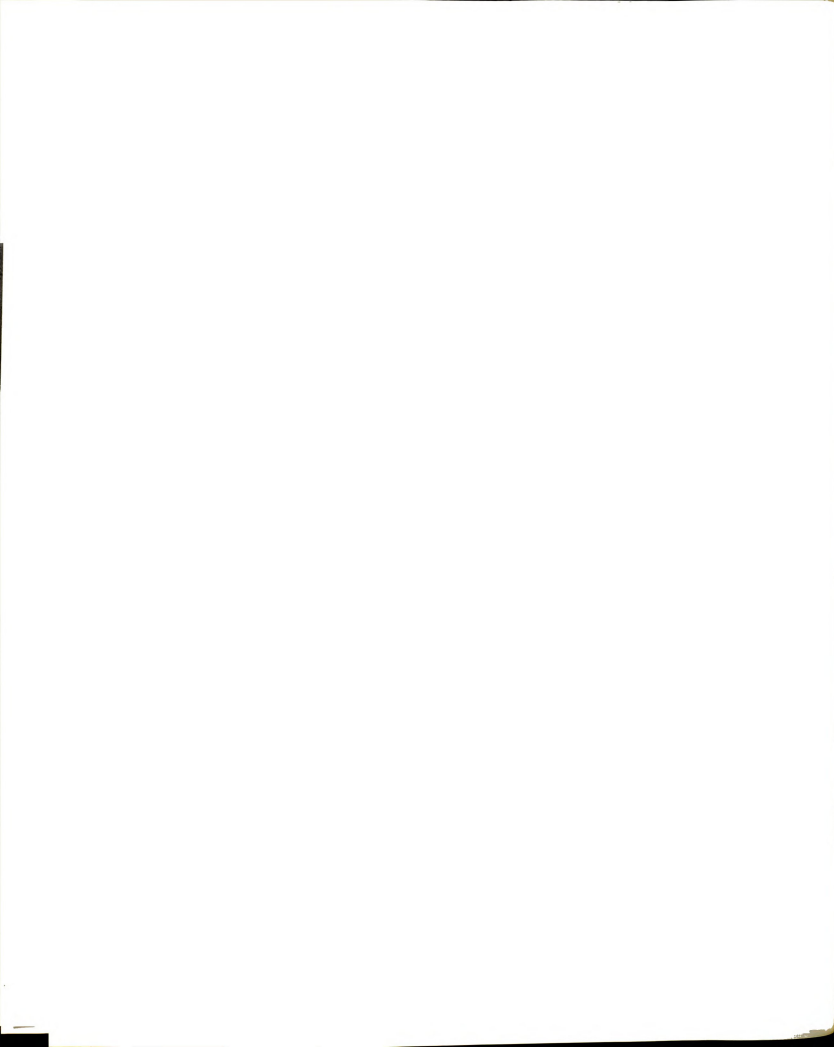
Quality Specifications for Graded Pompon
Chrysanthemums¹

All grades shall contain sprays (a) of chrysanthemums with flowers that are fresh (b) and symmetrical (c). There shall be not less than the designated minimum of open top flowers per spray (d). The stem shall be not less than the stated length (e), fairly straight (f), and rigid enough to support the flowers in a fairly upright position (g). The foliage shall be fresh (b) and stripped at least one third but not more than one half the total length of the stem measured from the bottom. Flowers, stem, and foliage shall be free from damage (h).

Definitions:

- (a) Spray means chrysanthemums grown with more than one flower per stem.
- (b) Fresh means that the flowers and foliage are bright and may not be more than slightly wilted.
- (c) Symmetrical means that the flowers are of normal shape.
- (d) Open means that the flower has opened to a minimum of a complete circle with all the back petals in one plane, at 90 degrees to the

¹Revised from NCM-35: 1966. "Market grades and standards for carnations, chrysanthemums, and roses." A North Central Region Publication; mimeograph.



peduncle, and with the center not yet fully opened or developed. Half-open flowers may be counted as halves; buds not at all.

- (e) Length means the distance between the bottom end of the stem and the topmost flower per spray.
- (f) Fairly straight means that the stem is of normal growth and not more than slightly curved or crooked: holding the stem near the base in a vertical position, the flowers should come to rest within 30 degrees of vertical in any direction (position of the hands of a clock at 10 to 2).
- (g) Stem rigidity or stiffness to be measured in the same way as in (f) above.
- (h) Damage means any discoloration or defect caused by dirt or other foreign materials, moisture, insects, diseases, nutritional, chemical, or mechanical means which affect the appearance, shipping, or keeping quality.

When bunched, all sprays per bunch shall be of the same cultivar.



Grade dimensions used in 1966 test at Michigan State University.

Grade	Number open flowers per stem (minimum)	Stem length: min., inches	Number of stems/bunch
Blue	7	30	6
Red	5	25	6
Green	3	20	6
Black (Ungraded) Mixed		20 - 30	6 or more, to give bunch equivalent to standard mar- ket bunch at start of test.



APPENDIX IV



Summary of Floralux Grades Purchased by Six
Retail Florists: Test Weeks 1 Through 6

Florist	Week no.	Number of Floralux grades and ungraded bunches purchased				Total pompon purchases*	
		BLUE	RED	GREEN	BLACK	No.	% Floralux
#1	1	3	3	3	0	19	47.4
	2	0	0	0	0	10	0
	3	3	4	2	4	13	100
	4	6	4	4	4	18	100
	5	4	3	13	2	22	100
	6	8	2	0	1	25	44.0
#2	1	6	7	7	3	110	20.9
	2	5	5	6	6	80	27.5
	3	3	12	9	8	62	51.6
	4	8	6	11	4	107	27.1
	5	3	2	7	4	105	15.2
	6	7	4	5	1	75	22.7
#3	1	4	4	4	4	16	100
	2	4	8	9	5	26	100
	3	0	10	10	10	31	96.8
	4	0	5	5	5	19	79.0
	5	0	10	10	10	53	56.6
	6	0	4	4	4	17	70.6
#4	1	3	3	3	3	22	54.6
	2	3	3	3	0	16	56.3
	3	2	4	0	4	10	100
	4	0	5	0	7	18	66.7
	5	0	5	0	8	16	81.3
	6	6	3	0	3	25	48.0
#5	1	10	9	9	5	110	30.0
	2	10	10	10	10	64	62.5
	3	12	13	15	10	97	51.6
	4	5	13	12	10	56	71.4
	5	0	14	6	18	106	35.9
	6	0	7	9	2	30	60.0
# 6	1	4	4	4	2	64	21.9
	2	6	5	4	5	41	48.8
	3	0	1	0	3	4	100
	4	0	0	0	0	12	0
	5	0	0	0	0	0	0
	6	0	0	0	0	12	0

*Includes both Floralux and other pompon chrysanthemums purchased.



APPENDIX V

Recommendations for Future Flower Grading
Economics Studies, Based on Experiences
Gained in the Study Reported
in This Thesis

1. The availability of "equal numbers" of each grade in the market (page 22) could not adequately reflect seasonal changes in grade produced: neither did pompon chrysanthemums produced in Michigan compare with the majority of pompons in the market at all times. These two factors lead to inadequate reflections of demand in sales at various prices because of the competing yet non-comparable pompons.

Therefore, in a longer test it will be necessary to match the market grade trends by offering differing proportions of grades as the market changes. This could be achieved most accurately by purchasing a representative sample of the market pompons and regrading to the standards set, without regard to numbers of each grade.

2. Greater significance in the statistical analyses may be attained through:

- a. a larger sample of retail florists purchasing the graded pompons at one time, and
- b. longer duration of the test (ideally, this should be at least one year, to cover all supply and demand variations).

3. Prices should be varied over a greater range than was possible in this preliminary study, yet they should not be changed more frequently than once a week as some retailers buy only one time in the week.

4. Comprehensive retailer interviews might be conducted, with investigations into:

- a. demographic features of the sample, with possible correlation between the retailer profile and grading acceptance and/or uses of the grades offered,
- b. reasons for the retailer actions, determined by questioning beforehand (what would you do . . .?) and after (why did you . . .?), and correlation of the results, and
- c. their theoretical wishes for a grading system if such is felt to be desirable--this could be conducted in a retailer panel, possibly with demonstrations of various suggested grades and opportunity for the individuals to state opinions regarding these grades.

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