**THE PRICE-QUALITY RELATIONSHIP OF LINT COTTON IN FIVE
LOCAL MARKETS IN SOUTHEAST, MISSOURI: 1951-1953**

**A Thesis
Presented to
the Faculty of the Graduate School
University of Missouri**

**In Partial Fulfillment
of the Requirements for the Degree
Master of Science**

**by
Lennie G. Kizer
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The undersigned, appointed by the Dean of the Graduate Faculty, have
examined a thesis entitled

**THE PRICE-QUALITY RELATIONSHIP OF LINT COTTON IN
FIVE LOCAL MARKETS IN SOUTHEAST, MISSOURI: 1951-1953**

presented by **Lennie G. Kizer**

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and hereby certify that in their opinion it is worthy of acceptance.

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CHAPTER I

INTRODUCTION

Cotton is outranked only by tobacco in terms of total value of products derived per acre among Missouri crops. In the years 1951-1953, only corn and soybeans of the Missouri crops had a larger total return than cotton for the state.¹ From 1951-1953, the Missouri cotton production ranged from 309,000 to 449,000 bales per year, and the value ranged from \$55,373,000.00 to \$72,667,000.00 per year.² Cotton is predominantly grown in only eight counties of the state, but Missouri ranks between twelfth and thirteenth in both acreage and production of cotton in the United States.³

I. PURPOSE

A purpose of this study is to determine the effectiveness of the various local markets in reflecting to cotton producers the average price level prevailing for cotton, and in reflecting central market premiums and discounts in accordance with variation in quality.

¹Missouri State Department of Agriculture, Missouri Farm Census by Counties 1953 (Jefferson City, Missouri, 1953), pp. 5-6, 18.

²United States Department of Agriculture, Supplement for 1955 to Statistics on Cotton and Related Data, Agricultural Marketing Service, Statistical Bulletin No. 99, Washington: Government Printing Office, 1955), p. 19.

³Ibid., 20.

Another purpose will be to determine if hog-round buying, paying only one price for all qualities, is used to purchase the producer's products. In the event that cotton is not sold on the quality basis and hog-round buying prevails in the local market, the purpose is to resolve if this type of buying or buying based on quality gives the greatest advantage to the cotton producer.

An additional purpose is to evaluate the economic significance of these practices and suggest possible improvements, if any are needed, in the marketing structure.

II. JUSTIFICATION

One function of the pricing system in marketing is to reflect to producers what consumers demand. The cotton mills and spinners purchase cotton on a quality basis. In the pricing of cotton in local markets in Missouri, price differentials for quality are not apparent. If it is true, would certain changes be advantageous?

III. DEFINITION OF TERMS

The terms used in this dissertation in general will be those that are common in the cotton trade circles. A few will be unique to this study. Both the unique terms and those common in cotton trading are defined as an aid to the reader.

Grade. This refers principally to the noncotton elements. It is composed of color, foreign matter and ginning preparation. Grade

is largely dependent upon the effect to the boll after it opens in the field. Color gives evidence of weather, insect, disease and fungi damage. Damage from the latter three can take place before or after the boll opens. Foreign matter gives information as to the method of harvesting and weather conditions during and before harvesting.⁴ Ginning preparation is a term used to describe the degree of smoothness or roughness with which the lint is ginned.⁵

The possible grades of cotton are broken into two divisions, a major division of colors and minor divisions of each color. The major divisions are gray, white, spotted, tinged and yellow stained. Within each of these, there are a maximum of seven minor colors. These minor colors listed from high to low are Good Middling, Strict Middling, Middling, Strict Low Middling, Low Middling, Strict Good Ordinary and Good Ordinary. Only white cotton contains all seven minor colors.⁶ See Table I. The Secretary of Agriculture has the authority to change these classifications from time to time.⁷ These changes, however,

⁴Bureau of Agricultural Economics, The Classification of Cotton, United States Department of Agriculture, Miscellaneous Publication No. 310 (Washington: Government Printing Office, 1936), p. 10.

⁵Ibid.

⁶Agricultural Marketing Service, Cotton Division, The Classification of Cotton, United States Department of Agriculture, Miscellaneous Publication No. 310, 1956 revision (Washington: Government Printing Office, 1956), pp. 11-13.

⁷Robert L. Hunt, Smith-Doxey Classification, Fiber Testing and Problems of the Cotton Trade, Texas Agricultural Experiment Station, Bulletin 832 (College Station, Texas, May, 1956), p. 5.

TABLE I
UNIVERSAL STANDARDS FOR GRADE OF
AMERICAN UPLAND COTTON*

Gray	White	Spotted	Tinged	Yellow Stained
GM G	Good Middling	GM Sp	GM Tg	GM YS
SM G	Strict Middling	SM Sp	SM Tg	SM YS
M G	Middling	M Sp	M Tg	M YS
SIM G	Strict Low Middling	SIM Sp	SIM Tg	
	Low Middling	LM Sp	LM Tg	
	Strict Good Ordinary			
	Good Ordinary			

*Source: Agricultural Marketing Service, Cotton Division,
The Classification of Cotton, Miscellaneous Publication No. 310,
Revised, 1956, p. 13.

are primarily based on the needs and changes within the cotton industry.

Staple. Staple or staple length, as it is commonly called, refers to the length of the cotton fiber. It is defined in the original order setting staple standards as follows:

The length of staple of any cotton shall be the normal length by measurement, without regard to quality or value, of a typical portion of its fiber under a relative humidity of the atmosphere of 65 per cent and a temperature of 70 degrees F.⁸

Staple length for American Upland Cotton at present ranges from 13/16 inch to 1 13/32 by 1/32 of an inch, except 27/32 is omitted. These too, as grade, are changed from time to time to include more or drop existing staples as indicated by the official standards of staple length.⁹

Character. Fiber properties that are not included in grade and staple such as fineness, strength and uniformity go to make up or comprise character in cotton.¹⁰ At the present time there are no objective measures of character included in the official classification

⁸ Bureau of Agricultural Economics, op. cit., pp. 33-35.

⁹ Agricultural Marketing Service, Cotton Division, op. cit., p. 49.

¹⁰ L. D. Howell and Leonard J. Watson, Cotton Prices in Relation to Cotton Classification Service and to Quality Improvement, Bureau of Agricultural Economics, United States Department of Agriculture, Technical Bulletin No. 699 (Washington: Government Printing Office, 1939), p. 5.

of cotton. Character does, however, affect the spinning quality of cotton. The Cotton Colormeter, Shirley Analyzer, Suter-Webb Fiber Sorter, Fibrogram, Pressley Strength Tester and Micronaire have been developed and are now in use to test or determine color, foreign matter, fineness, maturity, length and length uniformity of cotton.¹¹

Quality. Quality refers to a combination of grade, staple and character. Combined they make up the commercial value of cotton. Since there are no means of measuring character officially, the price of cotton is quoted on grade and staple alone. The quality in all calculations of this paper will include only grade and staple for this reason.

Local Market. The local market is the point of first sale of a farm product. Since the cotton gin serves as the local market place for cotton it will be referred to as the local market.

Central Market. These markets perform the task of marketing the bulk of the cotton in the United States, and they are located in various cities throughout the South. The central market bridges the gap between the producer and spinner by assuming the responsibility for financing, classification, storage, assembly and transportation of cotton products. Storage facilities are available, but most of the

¹¹ Agricultural Marketing Service, Cotton Division, op. cit., pp. 42-47.

cotton does not physically enter the market,¹² but is stored largely in local warehouses.

The market includes offices for the trading agencies such as cotton buyers, brokers and dealers. It may also include future market brokers, insurance agencies, storage and transportation representatives and other marketing agencies. Transactions are conducted in private offices and in organized exchanges.¹³

Missouri cotton primarily enters the Memphis and Little Rock central markets. It makes up 13.7 per cent of the Memphis volume and 6.7 per cent of the Little Rock volume.¹⁴

Central Market Equivalent. The central market uses a system of points on or off a base to assign a value to a specific quality of cotton. Both grade and staple, the two factors making up the commercial value of cotton, have a separate point system. As the staple or grade increases above the base, points are added; and as they decrease below their specified base, points are deducted. They are then combined algebraically into one overall point system. The base that is commonly used is Middling White 15/16. For example, if at a specific time Good

¹²R. C. Soxman and Arthur L. Roberts, Marketing Practices at Central Spot Cotton Markets, Production and Marketing Administration, Cotton Branch, United States Department of Agriculture (Washington: Government Printing Office, 1948), p. 2.

¹³Ibid., p. 5.

¹⁴Ibid.

Middling Gray 1 1/16 was indicated in the market as 200 points on, this would be two dollars per one hundred pounds of cotton added to the base price. This gives no indication of the points on or off assigned to each factor of grade or staple.

This price given to a specific quality of cotton determined by points on or off a specific base is known as the central market equivalent, or it is often referred to as the central market price equivalent or market quotations.

Even-running lots. A lot of cotton is a bale or group of bales traded in a single transaction. In a transaction where the bales are homogeneous as to grade and staple, the lot is referred to as even running. A lot of cotton of this type would contain more than one bale.

Single bale lots. This is a lot of cotton in which only one bale is traded in a transaction.

Round lots. In contrast to even running lots, round lots, often referred to as round lots of list quality, are heterogeneous as to grade and staple. Cotton buyers and dealers often buy large numbers of relatively small round lots and sort them into relatively large even-running lots.

Seasonal. Cotton in Southeast Missouri begins to enter the market channels in September and possibly as early as August. Marketing reaches a peak in October and November, it then begins to dwindle until very little enters the market in February of the following year.

The market year has been broken into three periods. These periods will be called seasons, referred to as early, mid and late. Since they are primarily based on major changes in the central market quotations, their beginning and end and their length varies from year to year.

Annual. The market year will be referred to as annual to distinguish it from the three seasonal periods in future discussion.

IV. ORGANIZATION OF THE REMAINDER OF THE THESIS

The first division of the thesis is a discussion of the local market. It revolves around the different characteristics and trading practices associated with the local market place.

The next three topics are concerned primarily with the quality and local price of cotton. The initial topic describes the indexes used to facilitate the measurement of variation in the following two topics, quality and local price variation.

The remaining element is a discussion of the relation between quality and local price followed by a summary and conclusions.

V. DEVELOPMENT OF MISSOURI COTTON

Cotton has been called "King Cotton" and various other names of higher order by people in cotton areas. This gives an indication of the emphasis placed on this plant where it is adapted for growth. The lower delta section of Missouri is no exception. Until the near past,

cotton was a large consumer of labor resources; and it was the livelihood of the farmer, laborer, merchant, craftsman and people in professional fields. This was especially true following the decline of the lumber industry in this area.

State Production. Cotton has been grown in at least eighty-five counties throughout the state. In the mid-nineteenth century, it was produced for home and local consumption.¹⁵ By the latter nineteenth and early twentieth centuries, cotton was being baled and sold commercially.

The counties in the lower delta, Butler, Dunklin, Mississippi, New Madrid, Pemiscot, Ripley, Scott and Stoddard, have produced more than 60 per cent of the cotton since 1860; and they have grown more than 70 per cent of the acreage since 1880. In 1840, however, only 17 per cent was produced in this area. By 1920, the lower delta section contained more than 95 per cent of the acreage and production.¹⁶ The number of counties producing in the reporting years ranged from thirty-two in 1840 to fifteen in 1920.¹⁷ This does not represent the same counties

¹⁵ Missouri State Board of Agriculture, First Annual of the Missouri State Board of Agriculture, Appendix I (Jefferson City: Emory S. Foster, Public Printer, 1866), pp. 1-122; United States Bureau of the Census, Sixth thru the Fourteenth Census of the United States: 1840-1920 (Washington: Government and Public Printing Offices).

¹⁶ United States Bureau of the Census, Sixth thru the Fourteenth Census of the United States: 1840-1920 (Washington: Government and Public Printing Offices).

¹⁷ Ibid.

producing each time the survey was taken. The number of counties in the delta area producing between 1840 and 1920 ranged from four to eight.¹⁸ Although cotton has been produced throughout the state, Southeast Missouri has continually produced a majority of the cotton since 1860. See Table II.

Southeast Missouri Delta Production. This area was called "The Great Swamp" until the beginning of the twentieth century. Until the land was drained, cleared and flood controls provided, cotton production was slow to move into this area. Crops were largely confined to sandy ridges and hill land because of the lack of drainage in the low sections.

The first drainage was provided by the land and timber companies in an effort to drain the land to make the timber accessible for harvesting and to dispose of the cleared land. The first such company was the Hemmilburger-Luce Land and Timber Company which constructed the first drainage ditch in 1899.¹⁹ Following this, drainage ditches and flood control measures were constructed throughout the area financed by the sale of bonds.²⁰

¹⁸ Ibid.

¹⁹ Missouri State Planning Board, A State Plan for Missouri, Water Plan: 1938 (Jefferson City: Missouri State Planning Board, 1938), p. 320.

²⁰ Ibid.

TABLE II
COTTON ACREAGE, PRODUCTION AND NUMBER OF PRODUCING
COUNTIES IN MISSOURI, 1840-1920
(U.S. CENSUS REPORT)

Year	Acres			Production			No. producing Counties	No. Southeast* Counties
	Total	Southeast* Missouri	Per cent	Total	Southeast* Missouri	Per cent		
1840				302**	35**	17.0	32	4
1850								
1860				30,542**	19,146**	62.7	26	3
1870				1,246	1,092	83.6	33	8
1880	32,116	24,799	77.2	20,316	16,061	79.1	29	8
1890	54,277	44,222	81.4	14,926	12,429	83.2	29	8
1900	45,596	40,626	89.1	25,576	24,093	94.2	29	7
1910	96,527	88,416	91.6	54,498	51,638	94.8	14	8
1920	110,027	62,171	97.4	63,808	106,007	96.3	15	8

*This includes Butler, Dunklin, Mississippi, New Madrid, Pemiscot, Ripley, Scott and Stoddard Counties.

**In 1840 and 1860, production was listed by pounds produced. In the remaining years indicated, production was listed by bales produced.

Cotton acreage showed an upward trend from 1895 to 1920. Many of the counties of the delta section that produced very little cotton in 1900 began increasing their cotton acreage as drainage made land available.²¹ Through the many drainage and flood control projects now in effect as the Little River Drainage District, cotton has become an important commodity within the state. With this increased importance, there was a generation of interest in research from the cotton seed to the cotton shirt.

VI. SCOPE AND METHOD

The data used in this paper were collected from five local markets in the cotton area of Missouri as part of the study made by the Southern Regional Cotton Marketing Research Committee using twenty-five local markets throughout twelve states in the cotton south.²² The local market price, grade, staple and central market price was obtained for each bale of cotton entering the markets. The local market price for each bale was obtained from the records at the local markets. The information on grade and staple was obtained from district offices of the Agricultural Marketing Service of the Department of Agriculture.

²¹E. A. Logan and Jewell Mayes, Missouri By Counties, The Bulletin of the Missouri State Board of Agriculture, Vol. XXVIII, No. IV (Jefferson City: Missouri State Board of Agriculture, 1930), pp. 40-41.

²²William A. Faught, Cotton Price Relationships in Farmer's Local Market, Southern Cooperative Series, Bulletin No. 51 (Columbia, Missouri: Agricultural Experiment Station, 1957), pp. 7-8.

The grade and staple designation was made by cotton classers employed by the United States Department of Agriculture authorized to class cotton for loan entry. Price quotations for the various grades and staples for the local market price to be guaged by was obtained from the central market at Memphis, Tennessee as published or made available by the Agricultural Marketing Service. This central market appeared to provide information more closely related to the spinning value of cotton.

Other information obtained from the local markets was bale weights, lot number and size, date of sale and date of ginning.

CHAPTER II

LOCAL MARKET CHARACTERISTICS AND TRADING PRACTICES

The local market for cotton in Missouri is the local gin. This chapter will be devoted to a discussion of the characteristics and trading practices of local markets and cotton buyers with reference to gins both within and outside the study. Since much of the cotton in 1953 entered the government loan market, a section will be included on this topic.

I. OPERATION OF THE LOCAL MARKET

Buying practices. With the exception of cotton entering the government loan channels, cotton owned by cotton gin owners and managers and cotton sold through cooperative gins, approximately 100 per cent of the cotton was sold directly to the local gin. In the southern regional cotton study, this was found to be true among small markets located in the Central Cotton Belt or the Southeastern United States;¹ and in the Missouri study covering the year of 1947, it was found that 94.3 per cent of the growers sold directly to the local gin.²

¹William A. Faught, Cotton Price Relationships in Farmers' Local Markets, Southern Cooperative Series, Bulletin No. 51 (Columbia, Missouri: Agricultural Experiment Station, 1957), p. 22.

²Fred B. Anderson, "Marketing Missouri Cotton" (Unpublished Master's thesis, University of Missouri, Columbia, 1952), p. 42.

The local market in these cases served as a ready and convenient place for cotton producers to dispose of their products.

As a rule, it appears that the price producers received for their cotton is a reflection of the price paid by cotton buyers who buy from the local gin. Other factors that influence the local price of cotton were indications of the level of quality as government classifications, weather, type of harvesting, area grown and the markets own grading. All these factors and possibly others not indicated by the interviewees combined with the quality needs of the cotton buyers and the price he is willing to pay helps the local market determine the price to pay cotton producers for their products.

If cotton is to be sold by producers with price based on quality, the cotton must be ginned and graded before the selling transaction takes place. Otherwise, only indications of quality as was discussed before can be made.

To evaluate the extent to which grading may have taken place before the cotton was sold, a spread between the date of sale and date of ginning was calculated. Since cotton can not be graded until it is ginned, this gives an indication of the date of sale in relation to the time the grade is determined. The time period between ginning and grading depends largely upon the location of the gin in relation to a classification service. This may vary from one to several days.

For sales made before the cotton was ginned, there is a negative spread; and for sales after it was ginned, the spread is positive. A zero indicates that cotton was sold the same day it was ginned. A mean

and mode was calculated for each market by season, for each market by year, for each market all years combined, for each year all markets combined, and for all markets and all years combined. Markets I, II and IV were not active in all seasons. See Table III.

With only a few exceptions, more cotton was ginned and sold on the same day than any other single day. The mode of Market I was consistently positive for all seasons, years and markets and years combined. The mode was six in all periods except in the late season of 1952 when it was eleven. Market IV has six positive modes which included the modes for 1952, 1953 and 1951-1953. The remaining were zero and were only for seasons. Market V only had two positive seasonal modes, the remaining being zero. Market III and the totals for all years combined were zero in all cases.

Sixteen of the thirty-five seasonal means were negative or zero. Three of the nineteen positive means were less than one, and six were less than two. In the seasonal means with all markets combined, there were three negative means and four positive means less than one, out of the nine seasons. The seasonal means in Markets I and IV were all positive. Markets II and III were predominately negative, and Market V was predominately positive.

The mean and mode for all markets and years combined indicated a mode of zero and a mean of less than one. See Table III.

Leaving out Market II where the local market acted as an agent for the farmer to sell his products, a large amount of the cotton was sold before it could have been graded. Even cotton that was sold

TABLE III

THE MEAN AND MODE OF THE SPREAD BETWEEN DATE OF SALE AND DATE OF GINNING OF COTTON BY
SEASON AND YEAR FOR FIVE DESIGNATED MARKETS IN SOUTHEAST MISSOURI, 1951-1953

Year	Season	Market I		Market II		Market III		Market IV		Market V		Total	
		Mean	Mode	Mean	Mode	Mean	Mode	Mean	Mode	Mean	Mode	Mean	Mode
1951	Early					0	0	4.3	0	.2	0	.3	0
	Mid					-.0*	0			1.5	0	.6	0
	Late					-.3	0			2.5	0	1.0	0
	Total 1951					-.0*	0	4.3	0	.7	0	.4	0
1952	Early			.2	0	-.7	0	1.4	0	-.0*	0	-.1	0
	Mid	9.9	6	-.6	0	-.8	0	2.1	1	-.6	0	1.2	0
	Late	26.6	11	-.7	0	.7	0	12.4	9	0	0	11.1	0
	Total 1952	16.0	6	-.3	0	-.7	0	2.0	1	-.2	0	1.9	0
1953	Early			-3.7	0	-.4	0	3.5	0	10.0	13	-1.3	0
	Mid	6.4	6	-1.9	0	0	0	1.8	1	3.0	0	-.8	0
	Late	7.3	6	-1.9	0	0	0	5.0	1	6.8	3	3.0	0
	Total 1953	7.2	6	-2.9	0	-.3	0	3.4	0	6.5	0	-.4	0
Total 1951-1953		15.2	6	-2.5	0	-.4	0	2.5	1	1.1	0	.8	0

*Less than .1

following ginning but sold before the quality classification was returned could not have been sold on the basis of official classification.

Cost of handling baled cotton. There are several costs in handling baled cotton that are not directly passed back to the producer. These are such costs as transportation charges from the gin to the warehouse, charges for underweight bales and storage and compress charges³ plus other services required in handling baled cotton the ginner would not otherwise provide if he did not take possession of the cotton.

Transportation cost varies from local market to local market due to the varied distance between the gins and the cotton warehouse and different methods of transportation employed. In this study, there was no attempt to determine these costs exactly; but they do exist as a cost to the local market proprietor.

The standard weight for a bale of cotton is 500 pounds. The bale weight in the local markets studied ranged from as low as 200 pounds to as much as 700 pounds in the extreme cases. A penalty schedule for underweight bales has been set up by the Memphis Cotton Exchange setting penalties for certain weight classes.⁴ These penalties are one dollar for each bale weighing between 400 and 435 pounds,

³Personal communication with John M. Ragsdale, Extension Associate Professor of Agricultural Economics, University of Missouri.

⁴Memphis Cotton Exchange, Trading Rules of the Memphis Cotton Exchange, Revised to August 1, 1953, Rule 19, p. 9.

two dollars for each bale between 350 and 400 pounds and a bale weighing below 350 pounds is considered a reject or has a three dollar penalty. The penalties imposed for each of the three years studied combining the five markets were \$1,516 for 1951, \$1,181 for 1952, and \$3,405 for 1953. Underweight bales are not penalized providing they can be placed in a twenty bale lot of cotton which averages at least 495 pounds per bale.⁵ The above yearly penalties are then maximums, and in the actual case they may be less.

The seasonal bale weights in the local markets studied were below 500 pounds with only a few exceptions, Market III being the primary one. The yearly averages in this market for 1952, 1953 and the average for the period 1951-1953 were above 500 pounds. The overall averages for the markets studied did not differ greatly from the yearly averages of all cotton in Southeast Missouri.⁶ See Table IV.

Storage cost may be classed as cash and noncash cost. The noncash costs are largely the storage space provided by the local market itself from the time the cotton is baled until it is transported to the warehouse or compress. The cash cost can be divided into compress charges and receiving and monthly storage charges at the warehouse. The compress charges for a standard density bale was one dollar per bale for 1951 and one dollar and fifteen cents per bale each year for 1952 and

⁵ Ibid.

⁶ Agricultural Marketing Service, Statistics on Cotton and Related Data, United States Department of Agriculture, Statistical Bulletin No. 99 (Washington: Government Printing Office, November, 1955), p. 21.

TABLE IV
AVERAGE GROSS WEIGHT OF COTTON
BALES BY MARKET, SEASON AND YEARS
FROM 1951-1953

Year	Season	Markets					Total
		I	II	III	IV	V	
1951	Early			502	470	465	485
	Mid			484		463	476
	Late			476		467	472
	Total			496	470	465	482
1952	Early		501	522	489	485	502
	Mid	497	482	506	489	476	498
	Late	489	481	484	456	502	485
	Total	494	488	508	488	482	498
1953	Early	488	489	509	487	459	487
	Mid	464	482	475	479	458	481
	Late	456	460	499	469	462	463
	Total	481	483	505	484	459	483
1951-1953 Total		483	484	504	485	465	487

1953. The receiving charge was fifty-five cents per bale in 1951 and sixty-four cents per bale in 1952 and 1953, and the monthly storage charge changed from thirty-three cents in 1951 to forty-three cents per bale in 1952 and 1953.⁷

Other business enterprises. All of the gin owners in this study were also farmers holding a portion of land under their control. None indicated they had business enterprises outside this field. Many gin owners in the cotton area do have other types of farm related businesses as grain elevators, seed recleaners and cotton seed delinters; or they sell commodities as seed, fertilizers or farm machinery. Some have businesses that are not directly farm related. Even though they are in the agricultural field, most cotton gin owners practice either horizontal or vertical integration or both.

Competition among gins. In Southeast Missouri there are approximately 165 gins in operation. The average annual cotton production from 1946 to 1955 was 402,400 bales. This gives 2,438 bales per gin if the cotton was divided equally among them. While some gins average around 5,000 bales annually, the output in other gins is as low as 1,500 bales annually.

The cost of these gins, buildings and equipment range from \$75,000 to \$125,000 in terms of replacement value. The extremes are as low as \$40,000 or as high as \$175,000. The gin is operated from three

⁷Ibid., p. 22.

to six months per year, and these periods of operation may not be at full capacity at all times. Much of the cost is fixed and facilities lie idle from season to season with little or no alternative use. Other structures such as the storage buildings, scales and office which can be used throughout the year, make up a small portion of the total fixed cost of the firm.

This lays the basis for the competition among local gins. The gin owner, as is the owner of any firm, is interested in increasing his volume to more effectively utilize his existing resources. He preforms many services for cotton producers to increase his volume; and as a new service is initiated, it spreads throughout the industry becoming a standard fixture. It appears that many, if not all, cotton gins in Missouri are operating far from the minimum cost per unit of output considering the fixed and variable cost and annual volume.

II. OPERATION OF COTTON BUYERS

The cotton brokers and dealers from the central market buy round and even-running lots of cotton from the local market and sort them into large even-running lots. The lots are then held for sale to mills and spinners as demand materializes.⁸ The mill and spinner buyers may purchase cotton at the central market or in local areas.

⁸ R. C. Soxman and Arther L. Roberts, Marketing Practices at Central Spot Cotton Markets, Production and Marketing Administration, Cotton Branch, United States Department of Agriculture (Washington: Government Printing Office, 1948), p. 2.

Since most of the cotton is purchased from producers by the local gin, the cotton buyers engage in transactions with the local gin owners and managers. A few buyers visit these markets annually while others visit only when the type of cotton they want is available. Buyers may be abundant in only part of a season again depending on the supply of the quality of cotton they want. The early season checks of quality by buyers usually determines the number and type of buyers that will be doing the purchasing.

Grade and staple are determined separately and then combined to arrive at a description of quality. The grade is determined by comparing a sample of cotton to the "Universal Standards for United States Upland Cotton," for color, foreign matter and preparation.⁹ The linear inch is the basic standard for determining staple length, however, the process of stapling is facilitated by the use of a staple type which is a one pound portion of cotton of a designated staple type certified as to this type by the Secretary of Agriculture. Due to the difference in atmospheric conditions and temperature, the staple type is used more often than the linear inch.¹⁰ The cotton buyers make a pull from the cotton sample; and by a system of lapping, pulling and discarding, they prepare a portion of cotton for stapling. It then may be measured by

⁹ Agricultural Marketing Service, Cotton Division, The Classification of Cotton, United States Department of Agriculture, Miscellaneous Publication No. 310, 1956 revision (Washington: Government Printing Office, 1956) pp. 11-23.

¹⁰ Ibid., p. 32.

eye, ruler or by comparison with the staple type.¹¹

III. COTTON ENTERING THE GOVERNMENT LOAN

A considerable portion of the cotton from all markets in 1953 entered the government loan. There was no indication of any entering the loan in 1951; and only one market, Market IV, used this outlet in 1952. The volume in 1953 was less than 1,000 bales in Market II and IV, Market II being below 100. Market III and V were in excess of 2,000 bales, and Market I was between 1,000 and 2,000 bales. In all markets, the largest volume was in the early season followed by the late season with the lowest volume in the midseason. See Table IV. Since the data did not contain the loan price for cotton entering the loan except in two markets, it could not be determined why this pattern existed. The local price, however, as a rule was lower in the early and late season than in the midseason. In periods where the loan price was above the local price in the early and late seasons, it could cause this type of reaction to occur.

¹¹Ibid., p. 35.

TABLE V
VOLUME OF COTTON ENTERING THE GOVERNMENT LOAN BY SEASON

Year	Markets	Seasons			Total
		Early	Mid	Late	
Year	IV	1	2	11	14
1953	I	987	24	238	1,249
	II	80	7	11	98
	III	1,358	66	762	2,186
	IV	615	12	278	905
	V	2,237	6	561	2,804

CHAPTER III

CONSTRUCTION OF INDEXES

An index number can be defined as a comparison or summary of two situations from a particular base.¹ The type of calculation made herein might be called a deflated or adjusted price rather than an index, but the term "index" is used to distinguish between the two indexes, local price and quality.

I. QUALITY OR CENTRAL MARKET INDEX

Since the quality index is based on the central market quotations for the various qualities, the quality and central market indexes are one and the same. They will be referred to in either term depending on whether the comparison is with the quality of cotton or the central market price.

Problems of Comparison. There are twenty-four grades and nineteen staple lengths of cotton at the present time. This gives a possibility of 456 qualities of cotton. To determine the relationship between the local price and quality in the study, it was impossible to rank the various qualities in an order of importance and assign a number to each for comparison purposes. This is because the qualities do

¹Bruce D. Mudgett, Index Numbers (New York: John Wiley & Sons, Inc., 1951).

not maintain their relative positions to one another over an extended period. Also, one or more qualities may simultaneously have the same relative position due to the independent values of the two factors, grade and staple, making up quality. A low grade with a long staple on a specific day may have the same relative importance as a high grade and short staple. Under these circumstances, it was impossible to make the comparisons needed.

Contents and Method of Calculation. Since the actual observations could not be used in comparison, an index of quality representative of the actual observations had to be made. A system of using the central market equivalents for each quality was devised to give each quality a value. By doing this, it was irrelevant if two qualities had the same value; because they were for all practical purposes equal.

The problem was yet to be solved. While the central market equivalents gave values to quality for a specific day, it was not satisfactory for periods longer than a day. The equivalents change from day to day with no degree of order. On a specified day, one quality may have a quotation higher than another; but by some change in the relative premiums and discounts for grade and staple, these two qualities may have equal prices the following day. These unequal changes of quotations among the various qualities make comparison between qualities or quality and price difficult and inaccurate except for a specific day.

The next phase was to deflate these daily equivalents to a comparable status. For this, a seasonal price index was calculated. The market year was broken into three seasons, early, mid and late. These

divisions were made on the basis of homogeneity with reference to changes of the central market quotations within the period. The seasons for this reason are not of equal length nor do they begin or end at the same time in each of the three years considered. A simple average was made of the prices of the base quality, Middling White fifteensixteenths, within each of the nine seasons. This was used as the base for a price index. The daily base price was then divided by the average base price for the season giving a price index to be used to take out the daily price influences. The price index computed for each particular day was used to deflate that day's quotations. When the price index was used as a base for the central market equivalent, the resulting computations could be comparable between markets, days, seasons or years. The formula for computation of the index, deflated price, is as follows:

$$\frac{\text{Central Market Equivalents}}{\frac{\text{Daily Base Price}}{\text{Seasonal Average Daily Base Price}}}$$

II. LOCAL PRICE INDEX

The calculation of the local price index parallels that of the quality index.

Problems and Purpose of Calculation. The same problems do not exist in the construction of the local price index as in the quality index since price is a value and can be easily ranked in order. The primary purpose of the construction was to put local prices on the same basis as quality for comparison purposes. Local prices as they actually

exist can be compared within or between markets or intervals of time.

Contents of the Index and Method of Calculation. In computing the local price index, the same price indexes as in the quality index was used as a base. The various local prices offered during the day were divided by the price index of that day. The seasonal periods in this index are the same as was used in the quality index. The formula used in construction is as follows:

$$\frac{\text{Local Price}}{\text{Price Index (Seasonal)}}$$

III. SUMMARY

The study covers a period of three years, each having three seasons. Each season has its own base, for the price index, the average of the daily base prices; and each day has its own price index used for deflating. It is recognized that indexes from different bases can not be compared directly; but by constructing a price index for each day using the average seasonal base price for quality as a base, it takes into consideration the changes in the price influence of each period more so than an annual or three year price index by being closer to the actual situation. This furnishes deflated prices for both quality and local price that are more homogeneous and easily comparable for all periods in question. Also, it furnishes a more highly accurate comparison on seasonal levels.

The calculations have indexes to aid in discussing them and their

variations. They serve the purpose better than an index in the form of a per cent since they are more nearly comparable or recognizable to the actual local price and central market equivalent and through the latter represent quality.

CHAPTER IV

QUALITY VARIATION

The objective of the next step in the study was to obtain a measure of the extent to which different lots of cotton delivered to the gins varied in quality. Since the means and the standard deviation of the daily qualities change often, relative variation (or per cent variation) is the measure used.¹ Determination of variation in quality by this method was made for cotton delivered on each day, for deliveries within each season, and for deliveries within each year, within the study. In addition, the relative variation that occurred within days for periods where the same market price prevailed for three days or more was studied.

A similar measure of variation of quality on days when a single price prevailed for a single day was studied.

I. DAILY VARIATION

The range in daily variation in quality for all markets in all years studied was from 0 to 16 per cent. In terms of the adjusted prices used in the study, this much range in quality could account for a difference of \$9.55 per hundred pounds in the value of the cotton. On many of the days with a zero relative variation, only one or two bales were sold. Of the 257 days included in the study, the relative variation was

¹This method is described as relative standard deviation or coefficient of variation by: George W. Schnedcor, Statistical Methods, 5th Edition (Ames, Iowa, Iowa State College Press, 1956), pp. 44 and 62.

6 per cent or more on fourteen days, seven of which applied to Market II sales and four of which applied to Market IV sales.

The following is an analyses of the daily relative variation within markets and between markets.

Within market variations. The daily variation in quality in terms of the percentage of relative variation within each season by market and by year were scattered throughout the range in no apparent, definite pattern, nor was there any degree of rigidity. There was a slight indication that as the year progressed from early to late season, the daily variations within the market became larger. See Table VI.

An accumulation of the daily variations were made by seasons within each market for the duration of the project and totaled by season exclusive of markets. In each market, as the season progressed, the variation in quality tended to increase. It, however, was not clear cut as there was considerable overlap. The progression was even more apparent when each season was totaled. See Table VII.

An analysis of variance on the daily relative variations combining all markets and years, indicated that the seasons were not homogeneous. There was a significant difference between them, using the 5 per cent point to define the region of rejection.

Between market variations. To discover any possible differences between markets, the daily relative variations for the three years, 1951 through 1953, were combined by markets. The relative variations by market, season and year indicated some differences, but the breakdown was

TABLE VI

THE SIZE OF THE DAILY RELATIVE VARIATIONS OF QUALITY
FOR ALL MARKETS AND YEARS BY SEASON*

Year	Market	Season	Relative Variation in Per Cent					
			0.0- 0.99	1.0- 1.99	2.0- 2.99	3.0- 3.99	4.0- 4.99	5.0 Plus
1951	I	Early		1				1
		Mid		3			1	
		Late			1			
	III	Early	3	7	2			
		Mid		1	3	2	1	
		Late	2		1	1		
	IV	Early	2	1	1			
		Late						
	V	Early	1	1	9	1	1	
		Mid			4	2	1	
		Late	1		1			1
1952	I	Mid			2			
		Late			2	1		
	II	Early	3	3				
		Mid	1		3		2	
		Late	2			2	6	4
	III	Early	7	2				
		Mid		1	7	4	1	
		Late	1		1	2	1	2
	IV	Early	1	2	1	1	1	
		Mid	2		6	1		1
		Late			2	1		
	V	Early	2	6				
		Mid	2	2	1	1		
		Late	1					
1953	I	Mid		1				
		Late				2	1	
	II	Early	1	3	2	1	7	2
		Mid	1		1	3	3	2
		Late	1		1	2	2	2
		Late						

TABLE VI (Continued)

Year	Market	Season	Relative Variation in Per Cent					
			0.0- 0.99	1.0- 1.99	2.0- 2.99	3.0- 3.99	4.0- 4.99	5.0 Plus
1953	III	Early	9	7				
		Mid	2	2	1	2		1
		Late	1			2		1
	IV	Early	6	7				
		Mid	4		1			
		Late		1				
	V	Early	5	2				
		Mid	1	1			1	2
		Late	2			2		5

Note: Those markets or seasons omitted from the table were not active for the days studied in the prospective period.

*Source: Appendix A, Table I.

TABLE VII

DISTRIBUTION OF 257 MARKET DAYS BY DAILY RELATIVE VARIATIONS OF
QUALITY BY MARKET AND BY YEAR, 1951-1953*

Market	Season	Relative Variation in Per Cent					
		0.0- 0.99	1.0- 1.99	2.0- 2.99	3.0- 3.99	4.0- 4.99	5.0- Plus
I	Early		2	2			1
	Mid		3	2		1	
	Late			1	3	1	
II	Early	4	6	2	1	7	2
	Mid	2		4	3	5	2
	Late	3		1	4	8	6
III	Early	19	16	2			
	Mid	2	4	11	8	2	1
	Late	4		2	5	1	3
IV	Early	9	10	2	1	1	
	Mid	6		7	1		1
	Late		1	2	1		
V	Early	8	9	9	1	1	
	Mid	3	3	5	3	2	2
	Late	4		1	2		6
Total	Early	40	43	17	3	9	3
	Mid	13	10	29	15	10	6
	Late	11	1	7	15	11	15

*Source: Appendix A, Table I.

too fine for determination. When the daily relative variations were combined by market, the difference between markets was apparent. See Table VIII. In Markets III and IV, there were more days that had relative variations of less than 1 per cent than for any other percentage class, with the number of days decreasing in each succeeding higher percentage class. This same pattern existed in Market I except that there were no daily variations of less than 1 per cent.

The pattern in Market II was almost the opposite. The number of days with each level of relative variation increased as the relative variation increased, reaching a peak of twenty days with a relative variation between 4 and 5 per cent. One exception was noted in Market II. More days with a relative variation less than 1 per cent than in either of the percentage levels of 1, 2 or 3 per cent was the exception to this pattern.

Market IV was rather erratic in comparison to the other markets. There were more days with daily variations of less than 3 per cent than daily variations higher than 3 per cent. No pattern was evident. See Table VIII.

An analysis of variance indicated a significant difference between the markets. Additional statistical analysis indicated that Market II differed significantly from Markets III, IV and V; and Market I differed significantly from Market IV. The latter difference, however, was due primarily to the fact that there were no days in which Market I had relative variations between zero and 1 per cent; whereas Market IV had fifteen days with relative variations in this range. The statistical

TABLE VIII

DISTRIBUTION OF 257 MARKET DAYS BY DAILY RELATIVE VARIATIONS OF
QUALITY BY MARKETS, 1951-1953*

Market	Relative Variation in Per Cent					
	0.0- 0.99	1.0- 1.99	2.0- 2.99	3.0- 3.99	4.0- 4.99	5.0- Plus
I		5	5	3	2	1
II	9	6	7	8	20	10
III	25	20	15	13	3	4
IV	15	11	11	3	1	1
V	15	12	15	6	3	8

*Source: Appendix A, Table I.

TABLE IX

DISTRIBUTION OF 257 MARKET DAYS BY DAILY RELATIVE VARIATIONS OF
QUALITY BY YEAR*

Year	Relative Variation in Per Cent					
	0.0- 0.99	1.0- 1.99	2.0- 2.99	3.0- 3.99	4.0- 4.99	5.0- Plus
1951	9	14	22	6	4	2
1952	22	16	25	13	11	7
1953	33	24	6	14	14	15
Total	64	54	53	33	29	24

*Source: Appendix A, Table I

analysis in this case bears out the observed differences.

Between year variations. The daily variations were then combined by year to determine if there were any differences between years. In 1951 and in 1952, there were more days with daily variation between 2 and 3 per cent than there were days with daily variations in any other percentage class. In 1953, there were more days with relative variations less than 1 per cent than for any other percentage class.

Analysis of variance indicated a significant difference between the years, with 1953 differing from 1951 and 1952. In the total for all years, the number of days in each percentage relative variation class decreased as the per cent variation increased. See Table IX.

II. SINGLE PRICE PERIOD VARIATIONS

There were several instances in which a single local price was offered in a market for a day or for several days in succession. There were eight periods of three days or more with a single price, and seventy-four periods of one day in length. Market V was the only market with single price periods of three days or longer in the years 1951 and 1952. Markets III and IV were the only markets with such periods in 1953. All markets had days in which only one price was offered.

The range of relative variations within the periods, including all periods, of a sustained single price was from 0 to 4 per cent; however, there were only six days with relative variations greater than 3 per cent. For the periods one day in length, the range in relative variation was

from 0 to 8 per cent.

Within market variations. In 1951, there were three periods of three days or longer in which a single local price prevailed in Market V. In 1952 there were three such periods in Market V. In 1953 there was one such period in Market III and one such period in Market IV. Although the variation in quality was more constant in each of the periods in 1951 than in the periods in 1952 and 1953, except Market III in 1953, the daily variation was larger in 1951, being predominantly between 2 and 3 per cent. The largest variation in 1951 was 4.47 per cent, and the smallest variation was .98 per cent. Of the eleven days represented in 1952, six had relative variation in the 1 per cent bracket, four were less than 1 per cent, and one was 2 per cent or more. The variation in Market III in 1953 ranged from .47 to .86 per cent. The variation in Market IV during that year was considerably greater, ranging from zero to 1.29 per cent. See Table X.

The variation in quality for periods of less than three days in length was less stable and larger than the single price periods of three days or more. In ten days of the seventy-four days, the variation was 4 per cent or more. These variations occurred primarily in Markets II and V. With the exception of 2 days for Market I, the variation in all markets was three per cent or below. The twenty days with 0 per cent variation were largely days of low volume with one or two bales. See Table XI.

TABLE X

RELATIVE VARIATION, STANDARD DEVIATION AND MEAN OF QUALITY
FOR SUSTAINED PERIODS OF SINGLE LOCAL PRICE*

Year	Market	Season	Local price	No. obs.	Standard deviation	Quality index mean	Relative variation
1951	V	Early	3700	29	83.83	3716.17	2.26
				27	87.69	3675.58	2.38
				42	35.01	3589.15	.98
1951	V	Early	3800	66	69.39	3624.95	1.91
				51	86.45	3707.89	2.33
				53	89.00	3705.52	2.40
				46	88.92	3679.22	2.42
				58	76.30	3628.56	2.10
				40	126.99	3679.22	3.45
				49	84.98	3662.51	2.32
				67	83.23	3661.56	2.27
				30	90.33	3602.96	2.51
				70	162.31	3633.45	4.47
				21	85.34	4154.50	2.05
1951	V	Mid	3900	17	117.93	3744.81	3.15
				24	175.57	3689.40	4.76
				40	105.37	3534.73	2.98
				32	86.43	3503.68	2.47
				40	114.58	3584.98	3.20
1952	V	Early	4100	46	39.08	3984.75	.98
				40	52.93	3981.91	1.33
				48	40.82	3927.74	1.04
1952	V	Early	4000	24	73.01	3943.65	1.85
				49	39.51	3969.75	1.00
				45	49.48	3966.96	1.25
				49	32.80	3971.67	.83
1952	V	Mid	3200	10	107.13	3401.95	3.15
				4	0	3446.40	0
				14	44.61	3421.27	1.30
				1	0	3212.39	0
1953	III	Early	3500	29	16.36	3491.53	.47
				29	20.54	3485.00	.59
				37	29.91	3498.07	.86

TABLE X (Continued)

Year	Market	Season	Local price	No. obs.	Standard deviation	Quality index mean	Relative variation
1953	IV	Early	3500	3	0	3435.00	0
				10	33.67	3459.04	.97
				4	24.92	3471.82	.72
				5	44.78	3477.60	1.29
				4	35.34	3434.72	1.03
				7	30.13	3405.96	.88
				3	0	3435.57	0
				29	35.66	3472.53	1.03
				23	30.47	3466.64	.88
				15	42.86	3429.00	1.25

TABLE XI

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DISTRIBUTION OF MARKET DAYS BY DAILY RELATIVE VARIATIONS OF
QUALITY IN SINGLE LOCAL PRICE PERIODS OF ONE DAY
IN LENGTH BY YEAR AND BY MARKET*

Year	Market	0.0- 0.99	1.0- 1.99	2.0- 2.99	3.0- 3.99	4.0- 4.99	5.0- plus
1951	I		4			1	1
	II						
	III	(2)	1				
	IV	(1)	1				
	V	1		1			1
1952	I			1	1		
	II	2 (4)	2	1	1	2	2
	III	2 (1)					
	IV	(1)		4	2		
	V	(1)	1				
1953	I		1				
	II	1 (2)	2	2	1		
	III	4 (2)	2	1			
	IV	3		1			
	V	(6)			1		3

Note: Those observations inclosed by brackets are days where there was no variation in quality. In many cases, only one or two bales entered the market on these days.

*Source: Appendix A, Table I.

Between market variations. Generally it was apparent that the variation within a market was larger than the variation between markets, especially for the periods of a sustained single price. In periods with a single price only one day in length, Markets II and IV, as was found in the previous section, had days with the largest variation. The remaining markets were more homogeneous with respect to the size of the variation in quality.

III. SEASONAL VARIATION

This section will be concerned with the seasonal variation² of quality within and between markets and of grouped markets. Since it is recognized that there is more variation within the sum of a group of samples than within each individual sample of that group, the relative variation here will pertain only to the relationship within and between the seasons and markets and not to its magnitude.

Within market variations. As was indicated in Section I, the variation in quality had a tendency to increase from early to late season. In 1951, the late seasons of all markets had less variation than the mid seasons but greater than the early seasons. With the exception, however, of the late season in Market V which had only one observation and no quality variation, the quality variation increased from early to late season for all markets in 1952. This was also true in 1953 except

²Each year has three seasons, early, mid and late, as described on page 8 and 9.

for Market IV and V. In Market IV, the mid season had a larger variation than the early and late; and in Market V, the mid season variation was ~~smaller~~ than the early and late season. See Table XII.

Between market variation. It was indicated by statistical analysis that the markets were not significantly different in quality variation within a particular season. The exception to this was the early seasons of 1951 and 1952. In 1951, Market I differed from the remaining markets, and in 1952 Market IV differed from Markets II and III. The remaining markets in both years, 1951 and 1952, were homogeneous with respect to quality. It was also indicated that the mid and late seasons were not significantly different between the three years. This was not true for the early seasons. The seasons, early, mid and late, were not homogeneous when combined for all years, 1951 to 1953.

Group market variation. To compute a line of regression of the relative variation for a season, each day was assigned a number beginning with one at the first of the season. These were called market days. An analysis of covariance indicated that each season could be combined into one regression line covering all years. This again indicated the variation in quality increased from the beginning to the end of each season. also, it indicated that the variation in quality increased from early to late season. See Figure 1.

IV. ANNUAL VARIATION

The variation in quality within and between markets has been discussed on a daily and seasonal basis. This section will be devoted to

TABLE XII
SEASONAL RELATIVE VARIATION OF THE QUALITY
OF COTTON BY MARKETS, 1951-1953*

Market	Season	Year		
		1951	1952	1953
I	Early	1.56		
	Mid	2.49	2.42	1.49
	Late	2.34	6.63	4.43
II	Early		.82	5.57
	Mid		4.08	5.76
	Late		4.31	7.09
III	Early	1.77	1.03	1.18
	Mid	6.13	4.07	4.97
	Late	3.71	4.67	7.57
IV	Early	2.11	3.52	1.14
	Mid		4.05	2.40
	Late		5.77	1.91
V	Early	2.81	1.24	6.06
	Mid	6.16	3.64	4.82
	Late	3.88	.00**	9.33

*Source: Appendix A, Table I.

**This season had only one observation.

FIGURE I

SEASONAL REGRESSION OF THE DAILY RELATIVE
VARIATION FOR ALL MARKETS, 1961-1953

the discussion of quality variation between markets and years on an annual basis. For the same reason as noted in the previous section the annual variation will not be discussed as to its magnitude.

Between market variation. On an annual basis, the markets were not alike in terms of quality variation. In 1951, Market V was not homogeneous to Market I and V; in 1952, Market II was not homogeneous to Market V; and in 1953, Market II was unlike Markets III and V, and Market I was unlike Market IV. Market IV was not active in the mid and late seasons of 1951 which may account for the difference in that year. Both in 1952 and 1953, the variation in quality of Market II was considerably greater than in some other markets, causing it to be heterogeneous to these markets. Market I was unlike Market IV in 1953 primarily because it was not active in the early season; whereas, there were more market days in Market IV in the early season than in the mid and late season combined. As was indicated in Section I, this pattern was observed when the markets were combined for the entire study.

Between year variation. The major factors causing variation in quality are differences in varieties planted, soils, rainfall, irrigation practices, fertilizers, temperatures, tillage practices, insect damage, length of growing season, exposure of open cotton before harvest, method of harvesting and ginning methods.³ It is apparent that these factors affect the quality of cotton in varying degrees in a market when

³AMS, Cotton Division, The Classification of Cotton, United States Department of Agriculture, Misc. Bul. No. 310, 1956 revised (Washington: Government Printing Office, 1956), p. 1.

when observing the annual variation of quality. There was no degree of rigidity of the variation in quality within a market over the period studied. However, there was a tendency for the variation to be larger in some years than others. As was indicated in Section I, 1953 was unlike 1952 and 1951 primarily because the variation was larger in 1953. See Table XIII.

V. SUMMARY

The portion of the study reported in this chapter was an attempt to measure the variation in the quality of cotton delivered by Missouri farmers to the gins for sale. The mean daily quality which is equivalent to the mean central market equivalent range from \$27 to \$42 per hundred pounds of cotton over the three year period of this study in terms of the adjusted prices. Estimates of the range of dollar value differences caused by quality variation have been made by applying these mean central market equivalents to the relative variations, taking in 67 per cent (1 standard deviation each side of the mean) of the variation.

The range of relative variation within the study was quite large, 0 to 16 per cent. However, there were only a few days with relative variation above 6 per cent. In all markets, the daily variation within the market increased as the year progressed from early season to late season. There was a difference between some markets in the variation of quality. Market II was the primary market that differed from the other markets. The remaining markets were homogeneous with respect to quality variation. There was a difference between the yearly patterns of qual-

TABLE XIII
ANNUAL RELATIVE VARIATION OF COTTON
QUALITY BY MARKET, 1951-1953*

Market	Year		
	1951	1952	1953
I	5.84	6.14	4.17
II		1.15	8.74
III	3.75	7.27	4.57
IV	2.11	6.19	2.57
V	3.09	5.55	9.37

*Source: Appendix A, Table I.

ity variation. The pattern in 1951 and 1952 was closely related, but the 1953 pattern was different. The range of dollar value differences, calculated as described above, was from \$0.00 to \$9.55 per hundred pounds. In only fourteen of the 257 days did the variation exceed \$3.95 per hundred pounds of cotton.

The variation of quality in periods of a single local price was not large nor was it erratic. The largest daily variation in Market V in 1951 amounted to \$3.51 and the smallest variation amounted to \$.70 per hundred pounds of cotton. This value difference ranged from \$0.00 to \$2.14 per hundred pounds in 1952 for Market V. In 1953, this range for Market III was from \$.33 to \$.60; and in Market IV, the range was from \$0.00 to \$.90.

The range in quality variation in terms of adjusted prices was from \$0.00 to \$5.66 in the single local price periods of one day in length. Sixty-three of the seventy-four observations were below \$1.36 per one hundred pounds.

With exception of Market I in 1951 and Market IV in 1952, all markets were similar in terms of seasonal quality variation. The variations of quality increased from early season to late season, and within each season there was greater variation as the season progressed from the first to the last of that season. On the annual basis the various markets were not closely related in quality variation. This may have been due to such factors as are described on page 48, which are known to cause variation in the quality of cotton. Neither was the pattern of relative variation the same in all years. In 1953, the variation in quality was significantly different from that in 1951 and 1952.

CHAPTER V

LOCAL PRICE VARIATION

As the previous chapter was concerned with only quality variation, this chapter will discuss local price variation with emphasis on daily, seasonal and annual variation. These two factors, quality and local price, will then be combined in the following chapter to determine their relationship.

I. DAILY VARIATION

There were 147 days of 257 which had a variation in local price below 1 per cent. Markets II, III and Market V in 1953 consistently had relatively more days with large variations than did the other markets. The relative variation in these markets ranged from 0 to 5 per cent. The remaining markets had daily variation predominantly below 2 per cent. See Table XIV.

The daily relative variations by market and by season including 1951 thru 1953 indicated Markets II, III, and V had days with the largest variation as pointed out above. There was a tendency for the variation to be larger in all markets as the year progressed from early season to late season, except in Market II. In this market there were days with sizable variation in all seasons. See Table XV.

When the daily variations were combined by markets including all years, all markets tended to have fewer days with larger variations, these variations ranging from 0 to 5 per cent. This again was not as

TABLE XIV

THE SIZE OF THE DAILY RELATIVE VARIATIONS OF LOCAL PRICE
FOR ALL MARKETS AND YEARS BY SEASON

Year	Market	Season	Relative Variation in Per Cent					
			0.0- 0.99	1.0- 1.99	2.0- 2.99	3.0- 3.99	4.0- 4.99	5.0- Plus
1951	I	Early	2					
		Mid	4					
		Late					1	
	III	Early	5	4	2	1		
		Mid	1	4	2			
		Late	3				1	
	IV	Early	4					
	V	Early	13					
		Mid	6	1				
		Late	3					
1952	I	Mid		1			1	
		Late	2	1				
	II	Early	5			1		
		Mid	2			1		3
		Late	7	1	1	1	2	2
	III	Early	7	1	1			
		Mid		1	7	3	1	1
		Late	1	1	1	2	1	1
	IV	Early	5	1				
		Mid	7	3				
		Late	1	1		1		
	V	Early	8					
		Mid	5	1				
		Late	1					
1953	I	Mid	1					
		Late			2			1
	II	Early	5	2	5		2	2
		Mid	2	2	1	2		3
		Late	3	1			2	2

TABLE XIV (Continued)

Year	Market	Season	Relative Variation in Per Cent					
			0.0- 0.99	1.0- 1.99	2.0- 2.99	3.0- 3.99	4.0 4.99	5.0- Plus
1953	III	Early	11	3	2			
		Mid	4	1			1	2
		Late	1				2	1
	IV	Early	13					
		Mid	4					1
		Late				1		
	V	Early	5	1			1	
		Mid	2		1	1		1
		Late	4	2		1		2

Note: Those markets or seasons omitted from the table were not active for the days studied in the prespective period.

*Source: Appendix A, Table I.

TABLE XV
DISTRIBUTION OF 257 MARKET DAYS BY DAILY RELATIVE VARIATIONS OF
LOCAL PRICE BY MARKET AND BY SEASON, 1951-1953*

Market	Season	Relative Variation					
		0.0- 0.9	1.0- 1.9	2.0- 2.9	3.0- 3.9	4.0- 4.9	Over 5.0
I	Early	2					
	Mid	5	1			1	
	Late	2	1	2		1	1
II	Early	10	2	5	1	2	2
	Mid	4	2	1	3		6
	Late	10	2	1	1	4	4
III	Early	23	8	5	1		
	Mid	5	6	10	3	2	3
	Late	5	1		2	4	2
IV	Early	22	1				
	Mid	11	3				1
	Late	1	1		2		
V	Early	26	1			1	
	Mid	13	2	1	1		1
	Late	8	2		1		2

*Source: Appendix A, Table I.

pronounced in Market II as in the remaining markets. See Table XVI.

The range in the number of prices offered per day was from one to twelve, all markets and all years included. Market III consistently gave a larger variety of prices per day than did the other markets. There were days within a particular season, however, when another market offered a larger number. This was very infrequent. The range in Market III was from one to six overall.

The range in Market II was from one to four, with ~~two~~ predominating. The variation in prices offered per day in Market II was quite large, which is due to the fact that there was a large spread between these two prices offered. Market V had a range from one to three different prices offered per day, with relatively few days when three were offered. The overall range in Markets I and V was large. In Market I it was from one to eight, and in Market V it was from one to twelve. There were some indications from interviewing the personnel at the various local markets that during the late season when the variation in quality increased, they had a tendency to use the government classification of quality and pay according to the support price schedule. The only time this was apparent in the study was in the late season of 1953 with Markets I and V. Other than this season, the range in these two markets was one to four different local prices offered per day. See Table XVII.

II. SEASONAL VARIATION

The seasonal variation in local price increased from early season

TABLE XVI
DISTRIBUTION OF 257 MARKET DAYS BY DAILY RELATIVE VARIATIONS OF
LOCAL PRICE BY MARKETS, 1951-1953*

Market	Relative Variation					
	0.0- 0.9	1.0- 1.9	2.0- 2.9	3.0- 3.9	4.0- 4.9	Over 5.0
I	9	2	2		2	1
II	24	6	7	5	6	12
III	33	15	15	6	6	5
IV	34	5		2		1
V	47	5	1	2	1	3

*Source: Appendix A, Table I.

TABLE XVII
 RANGE IN THE NUMBER OF DIFFERENT LOCAL PRICES OFFERED PER DAY
 BY YEAR, BY SEASON AND BY MARKET

Year	Season	Markets				
		I	II	III	IV	V
1951	Early	1-2		1-6	1-2	1-1
	Mid	1-1		1-5		1-2
	Late	2-2		1-3		1-1
1952	Early		1-2	1-4	1-2	1-1
	Mid	2-3	1-2	3-6	1-3	1-2
	Late	1-4	1-3	1-4	1-3	1-1
1953	Early		1-3	1-3	1-2	1-3
	Mid	1-1	1-4	1-3	1-2	1-4
	Late	2-8	1-3	1-3	3-3	1-12

to late season in all markets and years except Markets IV and V in 1951. Market IV, in 1951, had only the variation for the early season which is abnormally large for this season with respect to the other markets. In Market V, the variation was just reverse to the other markets, the largest variation being in the early season then decreasing to the late season. The seasonal variation of local price should not be discussed in terms of the magnitude of the variation since a variation will be indicated in seasons wherein a single local price is offered for a day but different prices are offered on different days. However, this seasonal variation helps to indicate the smaller range in the local prices during the early season than in the mid and late seasons even when they included single price periods. See Table XVIII.

The weighted average number of different prices offered in a market for a season indicated there was no pattern set within a market for the three years studied, nor was there a definite pattern set among markets within a year. Two seasons averaged four and above, two between three and four, twelve between two and three and twenty-two between one and two different prices offered per season. Markets III, IV, and V were the only markets which averaged over three different prices offered per day in any season. The late seasons generally did not have a larger number of prices than the other seasons which the preceding seasonal variation would indicate, but this again helps to indicate that the prices in the late season cover a larger range than in the other two seasons. See Table XIX.

TABLE XVIII
SEASONAL RELATIVE VARIATION BY MARKET AND YEAR*

Year	Season	Markets				
		I	II	III	IV	V
1951	Early	.26		1.58	7.44	8.61
	Mid	1.93		3.33		3.30
	Late	4.55		10.01		1.54
1952	Early		2.64	1.95	1.32	1.46
	Mid	2.29	6.09	3.83	1.53	3.58
	Late	8.48	6.31	7.37	5.39	0.00
1953	Early		4.28	1.32	.67	3.15
	Mid	0.00	4.94	5.74	2.74	3.88
	Late	5.48	7.72	7.69	3.08	8.82

TABLE XIX
AVERAGE NUMBER OF DAILY PRICES PER SEASON BY MARKET
BY SEASON AND BY YEAR

Market	Season	Year		
		1951	1952	1953
I	Early	1.5		
	Mid	1.0	2.5	1.0
	Late	2.0	2.0	4.7
II	Early		1.2	2.0
	Mid		1.7	2.4
	Late		1.7	2.0
III	Early	3.3	2.9	1.6
	Mid	2.8	4.4	2.0
	Late	1.2	2.6	1.5
IV	Early	1.5	1.7	1.2
	Mid		1.9	1.2
	Late		2.0	3.0
V	Early	1.0	1.0	1.6
	Mid	1.1	1.6	2.0
	Late	1.0	1.0	4.1

The markets were unlike in the variation of local price by season as they were in quality variation, except in the late seasons, the early season of 1952 and the mid season of 1953. The late and early seasons were enough alike in local price variation that they could be combined for the duration of the study. This was not true for the mid seasons. The variation in the early seasons increased from the first to the last of the seasons. The late season was just the opposite. The mid seasons for 1952 and 1953 indicated the same reaction as the early seasons, but there was a larger increase in 1953 than 1952. The mid season of 1951 gave the same response as the late season, but it was to a lesser degree. The variation in the late seasons, however, was larger than the early seasons. There was as great or a greater difference between the individual mid seasons than between a particular mid season and the early and late seasons. See Figure 2.

III. ANNUAL VARIATION

The annual variation in local price indicated different response by the markets both within the markets between years and between the years within a particular market. See Table XX.

IV. SUMMARY

The daily variation in local price was large in some cases, 3 per cent and above; even though the number of prices offered was small. The relative variation was predominantly from 0 to 1 per cent

FIGURE II

SEASONAL REGRESSION OF THE DAILY RELATIVE
VARIATION IN LOCAL PRICE FOR ALL MARKET COMBINED, 1951-1953

TABLE XX
ANNUAL RELATIVE VARIATION OF LOCAL PRICES
BY MARKET AND YEAR*

Year	Market				
	I	II	III	IV	V
1951	5.07		4.24	7.44	3.89
1952	7.44	13.78	7.37	3.53	7.95
1953	5.11	8.02	4.78	2.98	8.89

*Source: Appendix A, Table I.

in all markets. With infrequent exceptions, Markets II, III, and V were the only markets with daily variations in excess of 3 per cent. In market V such variation occurred only in 1953. There were markets with a large variation in daily local price which did not offer a large number of different daily prices. Market II had a large variation, but primarily offered one or two daily prices. Market III did not have as large a variation as Market II, but it offered more different local prices. However, the different prices offered in Market III covered a smaller range than in Market II.

The seasonal variation in local price had a tendency to increase from the early season to late season in almost all markets. Even though there were days in the late season with a single local price, this tends to indicate a greater effort on the part of the local market to find a representative price for quality.

The daily variation in price ranged from 0 to 14.74 per cent overall. In terms of adjusted price taking 67 per cent of the daily variation, the dollar value differences ranged from \$0.00 to \$8.56 per 100 pounds of cotton. There were only 18 days out of 257 when this dollar value difference was greater than \$3.36 per 100 pounds or when the relative variation was greater than 5 per cent. Also, there were four days with 5 per cent relative variation that had a dollar value difference below \$3.36. The variation in 205 days out of 257 total did not exceed \$2.29 per 100 pounds of cotton.

CHAPTER VI

ANALYSIS AND CONCLUSIONS

The objective of the quality variation measurements and local price variation measurements is to gain some measure of the extent to which local markets recognize quality differences in the prices paid farmers, and the extent to which local markets reflect central market differentials for quality. This chapter reports the results of an attempt to measure the extent to which these objectives are accomplished and the economic significance of variations in these respects in the local cotton market.

I. RELATIONSHIP BETWEEN LOCAL PRICE AND QUALITY

Three approaches are made to measure the relationship between local price and quality. The first is a measure of association, using correlation analysis. The second is a measure of the dollar value differences due to the difference between the central market evaluation of the qualities involved and the local market price. The third is an overall regression analysis between local prices and quality.

Correlation between local price and quality. The correlation coefficients between the daily local prices and the qualities for all qualities for all markets and for all seasons ranged from .0 to .99. For twenty of the 257 days the relationship was negative. These negative relationships were distributed throughout each market, and there was no concentration in any particular market. In 40 per cent of the

days in all markets and in all years, the correlation coefficient between local price and quality was between .0 and .09. In 10 per cent of the days, the correlation coefficient was .9 or higher. The remainder of the days were distributed about evenly between the rest of the possible correlation coefficients divided in class intervals of one-tenth of a point.

The large concentration of days in the lowest correlation coefficient class interval (0 to .09) can be attributed to the large number of days in which only one local price was offered. In Markets II and III, and in Market V in 1953, there was a larger distribution of days with correlation coefficients in the upper range than was true in the other markets. Even though the actual number of daily prices offered in Market II was low, the relationship between price and quality in this market was equal to the relationship in Market III. The coefficient of correlation between market price and value in Markets I and IV, and in Market V except for 1953, was .4 or below, except for 11 days. See Table XXI.

On the seasonal basis, Markets II and III, and Market IV in 1953, again had a larger correlation coefficient between local price and quality than did the other markets. However, since these seasons cover a longer period of time, the correlation coefficients in all markets are higher for the season than it is on the daily basis. Except in three cases, the correlation coefficient for each year by markets were above .8. When all markets and all years are combined, this correlation coefficient is .91. See Tables XXII and XXIII. This indicates

TABLE XXI

FREQUENCY DISTRIBUTION OF THE DAILY COEFFICIENT OF CORRELATIONS FOR MARKETS BY YEAR,
FOR EACH YEAR AND FOR ALL YEARS AND MARKETS COMBINED

Market	Year	Correlation Coefficients									
		.0- .099	.1- .199	.2- .299	.3- .399	.4- .499	.5- .599	.6- .699	.7- .799	.8 .899	.9- .999
I	1951	5	1*			1*					
	1952	2		1	1						1
	1953	1									3
II	1951										
	1952	10	1	2*	3*	1	1			1	1
	1953	8	2			3*	1	3	3	4	8
III	1951	10**	5*	2*	1		1	1	1		
	1952	7*	1		5	3	3	2	4	2	1
	1953	10		2			3	3	1	3	4
IV	1951	1	1								1
	1952	10**	1*	3**	1	1		1			1
	1953	13	1*			2*	2				
V	1951	22		1							
	1952	11					2				
	1953	6			2*	2*			1		5*
Total	1951	38	7	3	1	1	1	1	1		1
	1952	40	3	6	10	5	6	3	4	3	5
	1953	38	3	2	2	7	6	6	5	7	20
Total;		116	13	11	13	13	13	10	10	10	26

*Indicates one observation has a negative correlation.

TABLE XXII
SEASONAL CORRELATION COEFFICIENTS BETWEEN LOCAL PRICE AND
AND QUALITY BY YEAR, BY SEASON AND BY MARKET*

Year	Season	Markets				
		I	II	III	IV	V
1951	Early	.25		.23	-.10	.07
	Mid	.72		.79		.43
	Late	-.19		.39		-.10
1952	Early		.08	.25	.35	-.18
	Mid	.03	.59	.69	.20	.63
	Late	.87	.39	.62	.91	.00
1953	Early		.82	.73	.14	.75
	Mid	.00	.70	.82	.78	.46
	Late	.91	.64	.95	.51	.89

*Source: Appendix A, Table I.

TABLE XXIII
ANNUAL CORRELATION COEFFICIENTS BETWEEN LOCAL PRICE
AND QUALITY BY MARKET AND YEAR*

Year	Market					Year total
	I	II	III	IV	V	
1951	.84		.57	-.10	.28	.61
1952	.83	.90	.92	.82	.90	.87
1953	.90	.89	.95	.82	.88	.92
1951-1953						.91

*Source: Appendix A, Table I.

that over a long period of time there is a rather high degree of association between local price and quality, although this is not necessarily true for each individual day within the time period.

Actual relationship between local price and quality. In this part of the analysis an attempt is made to evaluate the relationship between the adjusted local price and quality. The measure of quality for this purpose is the central market equivalent for each quality as described in Chapter III.

Within a particular day and market, there were instances wherein a higher price was paid for a bale of cotton than the price that was paid for another bale superior in quality. This was not an infrequent occurrence.

In most situations, the total price for a farm product is expected to be less than the central market price for that product by the cost of transportation to the local market plus any other necessary expenses between the local market and the central market. The relation between the price of cotton at Missouri local markets that were studied and the central market prices do not conform to this pattern.

The average daily local price was above the average central market price in 153 days of 257. The average local price was above the average central market price or not more than 100 points (\$1.00 per one hundred pounds of cotton) below the central market price in 225 days of 257. This is including all markets and all years. The local price was above the central market price in 75 per cent of the days in Markets IV and V, and it was above or not more than 100 points

below in 92 per cent of the days in Markets III, IV, and V. The other markets did not range this high. To some extent, this indicates the competitive position of the markets.

On the seasonal basis, the average local price was above the average central market price in over 60 per cent of the days and was above or not more than 100 points below in over 90 per cent of the days in both early and mid seasons. In this late season, in only 48 per cent of the days was the local price above the central market price and was above or not more than 100 points below in 69 per cent of the days. In an overall analysis, there were 60 per cent of the days with an average local price above the central market price; and in 88 per cent of the days, it was above or not lower than 100 points below. See Table XXIV.

Using the adjusted prices on the 8,315 bales of cotton included in the study, it is indicated that producers were paid \$.40 per hundred pounds of cotton, or \$2.00 per bale, more than it was worth in the central market. This amounts to \$16,630 on the cotton moving through these markets during the study. At this rate, the average Missouri crop of about 400,000 bales brings approximately \$800,000 more on the local market than it would in the central market used for quotations.

Results are of the same pattern when the data from all markets are analyzed by years. In 1951 and 1952, the spread of the local price over the central market price was \$.48 and \$.49 per hundred pounds respectively. In 1953 this spread was reduced to \$.16 per hundred pounds of cotton.

TABLE XXIV

COMPARISON OF THE AVERAGE LOCAL PRICE AND AVERAGE CENTRAL MARKET
PRICE BY SEASON, MARKET AND YEAR*

Year	Market	Seasons								
		Early			Middle			Late		
		(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)
1951	I	2	1	2	4	0	4	1	1	1
	II									
	III	12	3	12	7	5	7	4	0	2
	IV	4		2						
	V	13	12	13	7	6	6	3	2	3
1952	I				2	1	1	3	3	3
	II	6	0	2	6	5	5	14	1	1
	III	9	6	9	13	10	13	7	3	6
	IV	6	6	6	10	10	10	3	3	3
	V	8	6	8	6	2	3	1	0	0
1953	I				1	1	1	3	1	2
	II	16	10	16	10	4	10	8	5	7
	III	16	11	16	8	2	8	4	1	1
	IV	13	12	13	5	3	4	1	1	1
	V	7	6	7	5	2	5	9	8	9

(a) Total number of days in the season.

(b) Number of days that the average local price was above the average Memphis price.

(c) Number of days that average local price was above the average Memphis price or not more than 100 points below.

*Source: Appendix A, Table I.

There was considerable difference, however, between markets. In Markets II and III, the two prices were more nearly equal than in the remaining markets. Market II was not active in 1951; but combining the years 1952 and 1953, the local price averaged \$.13 per hundred pounds below the central market price. This was the only market wherein the local price averaged less than the central market price when all years were combined. In Market III, the three year average local price was \$.05 above the average central market price. In each year, these two prices were nearer equal than in any other market. In 1951, the local market price was \$.05 below the central market price, in 1952 it was \$.13 above and in 1953 it was \$.05 above.

Market I was the next most effective in terms of equating central and local price, with local price averaging \$.50 above central market price during the three years. However, in two years in this market the local price was below the central market price, by \$.29 in 1951 and by \$.50 in 1953. In 1952, the local price was \$1.29 per hundred pounds above the central market price.

The overall spread in Markets IV and V was similar but the spread within each year was quite different. There were no negative spreads in any year within these markets. The overall spread was a positive \$1.22 for Market IV and a positive \$1.08 for Market V. The range for Market IV was from \$.34 to \$1.59, and for Market V it was \$.47 to \$.81. See Table XXV.

Overall regression analysis. In the overall regression of quality and local price or central price and local price exclusive of mar-

TABLE XXV

RELATIONSHIP BETWEEN THE LOCAL PRICE AND THE CENTRAL MARKET
PRICE PER 100 POUNDS OF COTTON, PER BALE OF COTTON
AND TOTAL DIFFERENCE BY MARKET AND YEAR*

Market		Year			Total
		1951	1952	1953	
I	(a)	426	386	83	895
	(b)	- \$ 0.29	\$ 1.59	-\$ 0.50	\$ 0.50
	(c)	-\$ 1.45	\$ 7.95	-\$ 2.50	\$ 2.50
	(d)	-\$617.70	\$3068.70	-\$207.50	\$2237.50
II	(a)		224	1075	1299
	(b)		-\$ 1.28	\$ 0.10	-\$ 0.13
	(c)		-\$ 6.40	\$ 0.50	-\$ 0.65
	(d)		-\$1433.60	\$537.50	-\$844.35
III	(a)	1119	1759	755	3633
	(b)	-\$ 0.05	\$ 0.13	\$ 0.05	\$ 0.06
	(c)	-\$ 0.25	\$ 0.65	\$ 0.25	\$ 0.30
	(d)	-\$279.75	\$1443.35	\$188.75	\$1089.90
IV	(a)	35	526	222	819
	(b)	\$ 0.80	\$ 1.59	\$ 0.34	\$ 1.22
	(c)	\$ 4.00	\$ 7.95	\$ 1.70	\$ 6.10
	(d)	\$ 140.00	\$4181.70	\$377.40	\$4995.90
V	(a)	891	539	239	1669
	(b)	\$ 1.51	\$ 0.47	\$ 0.81	\$ 1.08
	(c)	\$ 7.55	\$ 2.35	\$ 4.05	\$ 5.40
	(d)	\$6727.05	\$1266.65	\$967.95	\$9012.60
Year	(a)	2471	3470	2374	8315
Total	(b)	\$ 0.48	\$ 0.49	\$ 0.16	\$ 0.40
	(c)	\$ 2.40	\$ 2.45	\$.80	\$ 2.00
	(d)	\$5930.40	\$8501.50	\$1899.20	\$16630.00

(a) Number of bales.

(b) Price spread between the average local and central market price per 100 pounds of cotton.

(c) Price difference per bale of cotton.

(d) Total price difference per market.

*Source: Appendix A, Table I.

kets and years, there was an increase in the variation of each from the first to the last of each year. This was indicated in quality on the seasonal basis. On local price variation, however, it was not clear cut when considering it on a seasonal basis. The variation in the early season increased, but it did not in the late season. In the mid season which could not be combined with the other two, there was a larger difference between the individual mid seasons than between a particular mid season and the other seasons.

In the early part of the year, the variation in local price was greater than the variation in quality; and the opposite was true in the late part of the year. There was a tendency for the markets to pay less than the central market value for the cotton more often in the early season than in the other seasons. See Figure 3.

II. HOG-ROUND VS QUALITY BUYING

The term hog-round buying, meaning the same price paid for all qualities of a product, has been used to describe the type of buying used in the local markets of Missouri. On days within a particular market where only one local price was offered, this is without question the pattern. However, as indicated by the daily variation in local price, there were a large number of days within the study when different prices were paid. But when the daily price quality relationships are studied closely, there is evidence that hog-round buying prevails. Although several prices may be offered on a particular day, each price tends to be hog-round in itself. Each price may be paid

FIGURE III

ANNUAL REGRESSION OF THE DAILY LOCAL PRICE
AND QUALITY FOR ALL MARKETS AND YEARS COMBINED

for cotton of all qualities throughout the time that that price prevails. Even in this situation the price tends to increase as the quality increases. This is summarized in Figure 4¹, which is a hypothetical case based on actual observations.

III. SUMMARY

There were many ramifications of the price-quality relationship within days in the various market places. In some instances producers were paid less than the central market value, and in some instances they were paid more. On occasion a higher price was paid for lower quality cotton than was paid for a higher quality cotton. As a rule, low quality cotton was over priced in the local market, and high quality cotton was under priced in terms of proper differentials from the average price paid. This was not only true for all prices combined within a day, but also for each particular price paid.

The local price did tend to increase as the quality increased, but it was not clear cut because within each particular price the opposite was true. The correlation between local price and quality or central market price was quite high on many days, but was higher in some markets than in others.

¹In Figure 4, a spread was made between the local price and quality without being adjusted by a price index. The presentation is not intended to indicate that a majority of the bales were paid less than the central quotation would indicate. It was intended that each price on a particular day within a particular market was hog-round in nature by being used to purchase cotton throughout all or part of the range in quality.

FIGURE IV

RELATIONSHIP BETWEEN QUALITY AND LOCAL PRICE IN
TERMS OF A SPREAD BETWEEN THE TWO. (HYPOTHETICAL BASED ON ACTUAL OBSERVATION)

Note: Each line may represent a particular price, day,
and market. The actual local price increases to the upper
right.

The variation in local price and the number of local prices offered in a market for a day did not always indicate the degree to which that market related price to quality. In three markets both the quality variations and local price variations were relatively low, but the relationship between the two were also low except for one year in one of the markets. These three markets were also the ones which had the largest spread of local price over the central market price. One other market usually offered one or two daily local prices, but the local price variation was larger than preceding three markets discussed due primarily to the spread between prices. The variation was comparable to a market which gave a variety of local prices. These latter two markets also had variations in quality that were comparable, and the association between quality and local price was high.

As the time periods increased from daily to seasonal and annual periods, the correlation between local price and quality increased. This indicated that even though a single price was offered for a day, there was an effort within the market to adjust price to quality.

The overall regression indicated that the relationship between price and quality was quite adequate, although the local price variation was over estimated in the early part of the year and under estimated in the late part. However, this does not say anything about the daily basis where there may be quality variation with no local price variation or that there is enough quality variation to justify paying on quality in the transactions of individual bales.

On the daily basis there were very few observations with over

5 per cent variation in quality. In order to have a common basis to guage from, the overall mean in quality will be used which is 3607.86. Using 5 per cent variation, this would amount to \$9.00 per bale price variation in terms of adjusted prices taking 67 per cent of the variations. Even with a mean quality of 4000.00, which is very seldom reached, the variation would amount to only \$10.00. The problem is, "Does this amount justify paying on quality?," keeping in mind that this is near the upper limit in variation. Fifty per cent of the daily observations were below 3 per cent in variation.

Hog-round buying is prevalent in Southeast Missouri, even though there is a variety of prices offered within a market. Not only are there many days where only one price is offered for a day within the markets, but each price in a multiple daily price market tends to result in hog-round buying. Also, many producers sell their cotton before it is ginned and therefore it cannot be sold on quality classifications.

IV. CONCLUSIONS

Two problems were to be discussed in this study. One was how well the local market related price to quality or how well it related local price to changes in the central market price. The second problem was to determine if hog-round buying prevailed in the markets. The two problems have been separated thus far, but actually they are very closely related.

Overall the price was related to quality with a relatively high

measure of association. This was not as true on the daily basis especially the 116 days out of 257 where very little if any local price variation existed. However, the quality variation in days or periods of low local price variation was from very low to almost negligible.

It is assumed there would be extra expenses involved in setting up and operating a classing service to class all cotton for sale on quality and keeping the cotton products flowing through the market channels as it does today even if existing facilities were used. In the long run, the measure of association between the local price and quality or central market price was relatively high. The margin to be gained by changing to paying for cotton products on a quality basis is very slight.

Hog-round buying has been considered a detriment in the exchange of products. By this type of practice the producer is unable to determine the desires of the consumer. It tends to discourage improvements in product quality since all qualities receive the same price. It does not encourage the proper handling of the products and leads to misallocation of resources. With this type of buying the society as a whole loses. The society may have a desire for a high quality product, but it is not registered to the producer. Therefore, there is a loss in satisfaction or the society is unable to maximize their total satisfaction. There may not be a loss to society in such a case if the variation in quality will not justify the extra expense. There may be a decrease in total satisfaction by paying on a quality basis in this

type of situation.

The level of prices paid in Missouri local markets is higher than can be warranted on the basis of central market prices minus transportation costs. The ginning charges throughout the cotton area of Missouri are almost constant; therefore, the local market's competitive power lies in the price paid producers for cotton, which it uses to increase the volume of ginning. This enables the local market to reap some economies of scale. Hog-round buying is also one of the forces that has helped to increase the mechanization and improvement of gins in this area. Hog-round buying is not desirable where there is enough variation in quality to justify the expense throughout the parts of the industry in paying on a quality basis, but where there is a small variation in quality, hog-round buying in itself may, to some extent, involve payment on a quality basis.

In the late part of the year when the quality variation increases and the number of daily local prices tends to decrease although the variation does not, there seems to be sound basis for existing classing facilities to be used to enable the local market to pay on quality classifications. In the early and mid part of the year, the variation in quality is small enough for the local market to keep a close watch on quality and not miss it too much. However, in the late season it may be unable to do this when erratic variations occur. This could lead to large losses to either the producer, the local market or both. This type of practice was indicated by some of the markets studied, and there were indications that it was practiced by

some markets in the late season of 1953 but not before. Since the volume of cotton entering the market in this period is usually less than in earlier periods, the existing classing facilities may be able to class cotton with a reasonable amount of speed.

Based on the existing conditions present during the time of this study and the data contained therein, there appears to be no basis for changing the marketing structure except in the late season where the variation in quality becomes more erratic.

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APPENDIX

TABLE I

DAILY, SEASONAL, AND ANNUAL MEANS, STANDARD DEVIATIONS, RELATIVE VARIATIONS, AND CORRELATED COEFFICIENTS
FOR THE QUALITY AND LOCAL PRICE INDICES FOR 1951, 1952, and 1953

Year	Market	Day and season	No. obs.	Market day	r	$\bar{X}$	Quality s	C	Local price Y s	C	
1951	I	9-26	3	2	-.490	3487.26	241.80	6.93	3674.14	0.00	.00
		10-22	262	13	.000	3765.01	46.57	1.24	3742.16	0.00	.00
		Early	265		.254	3761.87	58.73	1.56	3741.39	9.76	.26
		11-2	111	3	.000	4236.45	61.48	1.45	4157.95	0.00	.00
		11-7	18	5	.000	4217.52	80.72	1.91	4116.09	0.00	.00
		11-9	13	6	.000	4184.24	74.91	1.79	4174.59	0.00	.00
		11-16	5	9	.000	3804.55	168.41	4.43	3721.74	0.00	.00
		Mid	147		.721	4214.82	104.81	2.49	4139.46	79.83	1.93
		12-14	14	8	-.188	3784.26	88.74	2.34	4085.60	39.17	4.55
		Late	14		-.188	3784.26	88.74	2.34	4085.60	39.17	4.55
	Yearly Total		426		.840	3918.90	229.02	5.84	3890.06	197.13	5.07
1951	III	9-28	70	3	-.079	3778.61	20.38	.54	3850.50	29.84	.77
		10- 1	64	4	.096	3789.00	36.64	.97	3756.11	58.40	1.55
		10- 3	76	5	.095	3797.84	30.95	.81	3806.61	12.32	3.24
		10- 5	65	6	.164	3843.53	38.91	1.01	3816.87	15.34	.40
		10- 8	55	7	.109	3828.36	46.15	1.21	3764.58	39.21	1.04
		10-10	61	8	.000	3861.04	40.38	1.05	3797.23	.00	.00
		10-15	70	10	.606	3845.53	68.67	1.79	3805.45	26.62	.70
		10-17	35	11	.080	3844.82	80.76	2.10	3851.97	113.09	2.94
		10-19	87	12	.102	3849.29	55.54	1.44	3841.00	72.15	1.88
		10-22	82	13	-.189	3914.01	53.68	1.37	3818.83	7.68	.20
		10-24	28	14	.084	3885.62	34.90	.90	3820.13	101.42	2.65

TABLE I (Continued)

Year	Market	Day and season	No. obs.	Market day	r	$\bar{X}$	Quality s	C	Local price		
									Y	s	C
1951	III	10-26	93	15	.201	3900.51	80.67	2.07	3871.24	63.32	1.64
		Early	786		.234	3845.66	67.97	1.77	3818.71	60.42	1.58
		10-29	25	1	.026	4337.99	43.35	1.00	4239.98	5.62	1.33
		11- 9	59	6	.373	4096.14	83.91	2.05	4087.47	114.26	2.80
		11-16	46	9	.133	4126.60	85.00	2.06	4132.84	41.17	1.00
		11-19	54	10	.534	3770.02	147.53	3.91	4009.17	100.94	2.52
		11-21	60	11	.092	3724.76	120.64	3.24	3910.79	25.06	.64
		11-23	18	12	.799	3751.80	154.47	4.12	3902.99	42.86	1.10
		11-26	12	13	-.086	3710.09	89.59	2.41	3828.66	45.11	1.18
		Mid	274		.788	3938.20	241.22	6.13	4031.43	134.06	3.33
		11-30	49	2	-.283	3768.09	106.78	2.83	3712.11	156.94	4.23
		12- 7	1	5		3906.35	.00	.00	2744.74	.00	.00
		12-14	1	8		3897.00	.00	.00	2867.09	.00	.00
		12-19	8	10	.042	3493.70	190.64	3.14	2849.92	5.35	.19
		Late	59		.387	3735.42	138.75	3.71	3564.49	356.97	10.01
		Yearly Total	1119		.570	3862.50	144.98	3.75	3857.40	163.46	4.24
1951	IV	9-28	27	3	.173	3752.56	86.07	2.29	3857.47	133.90	.36
		10- 3	2	5	.996	3792.57	35.47	.94	3782.55	35.54	.94
		10- 5	4	6	.000	3824.31	51.81	1.35	3818.03	.00	.00
		10- 8	2	7		3766.84	.00	.00	3781.77	.00	.00
		Early	35		-.103	3763.86	79.58	2.11	3844.36	28.60	7.44
		Yearly Total	35		-.103	3763.86	79.58	2.11	3844.36	28.60	7.44

TABLE I (Continued)

Year	Market	Day and season	No. obs.	Market day	r	$\bar{X}$	Quality s	C	Local Price		
									Y	s	C
1951	V	9-24	29	1	.000	3716.17	83.83	2.26	3784.96	.00	.00
		9-26	27	2	.000	3675.58	87.69	2.38	3667.32	.00	.00
		9-28	42	3	.000	3589.15	35.01	.98	3743.19	.00	.00
		10- 1	66	4	.000	3624.95	64.39	1.91	3781.77	.00	.00
		10- 3	51	5	.000	3707.89	86.45	2.33	3807.60	.00	.00
		10- 5	53	6	.000	3705.52	89.00	2.40	3818.03	.00	.00
		10- 8	46	7	.000	3679.22	88.92	2.42	3781.77	.00	.00
		10-10	58	8	.000	3628.56	76.30	2.10	3797.23	.00	.00
		10-15	40	10	.000	3679.22	126.99	3.45	3807.60	.00	.00
		10-17	49	11	.000	3662.51	84.98	2.32	3807.60	.00	.00
		10-19	67	12	.000	3661.56	83.23	2.27	3807.60	.00	.00
		10-22	30	13	.000	3602.96	90.33	2.51	3792.06	.00	.00
		10-26	70	15	.000	3633.45	162.31	4.47	3818.03	.00	.00
		Early	628		.073	3656.98	102.93	2.81	3791.95	32.63	8.61
		10-29	21	1	.000	4154.50	85.34	2.05	4184.92	.00	.00
		11- 9	19	6	.272	3832.95	98.34	2.56	3642.44	44.24	1.21
		11-16	17	9	.000	3744.81	117.93	3.15	3922.91	.00	.00
		11-19	24	10	.000	3689.40	175.57	4.76	3965.86	.00	.00
		11-21	40	11	.000	3534.73	105.37	2.98	3904.12	.00	.00
		11-23	32	12	.000	3503.68	86.43	2.47	3880.88	.00	.00
		11-26	40	13	.000	3584.98	114.58	3.20	3853.36	.00	.00
		Mid	193		.429	3674.53	226.46	6.16	3903.87	128.96	3.30
		11-30	30	2	.000	3632.29	87.20	2.40	3742.26	.00	.00
		12- 3	18	3	.000	3589.79	32.25	.90	3755.32	.00	.00
		12-12	22	7	.000	3643.65	230.71	6.33	3625.11	.00	.00
		Late	70		-.100	3624.93	140.71	3.88	3708.80	56.98	1.54
		Yearly Total	891		.280	3658.26	142.58	3.90	3809.66	87.24	2.29
		Total 1951	2471		.607	3797.18	193.39	5.09	3845.63	149.53	3.89

TABLE I (Continued)

Year	Market	Day and season	No. obs.	Market day	r	$\bar{X}$	Quality s	c	Local price Y	s	C
1952	I	10- 3	3	1	.999	3797.18	90.26	2.45	3845.65	149.53	4.56
		10- 6	94	2	.219	3620.90	87.28	2.41	3722.45	38.42	1.03
		Mid	97		.031	3622.72	87.50	2.42	3709.37	85.03	2.29
		11-12	157	3	.000	3631.83	126.14	3.47	3914.27	.00	.00
		11-17	109	5	.308	3313.82	80.18	2.42	3386.74	66.43	1.96
		11-28	23	10	.000	3004.69	118.15	2.54	3037.38	.00	.00
		Late	289		.873	3461.98	229.61	6.63	3645.52	309.18	8.48
		Yearly Total	386		.827	3502.37	215.07	6.14	3661.56	272.31	7.44
1952	II	9-12	16	1	.000	4007.81	19.22	1.98	3965.68	.00	.00
		9-15	2	2		4045.53	.00	.00	3478.95	.00	.00
		9-17	3	3	.000	4024.03	23.30	.58	4012.33	.00	.00
		9-19	7	4		3984.91	52.67	1.32	3849.67	151.91	3.95
		9-22	12	5	.000	3991.50	41.47	1.04	3861.54	.00	.00
		9-24	20	6	.000	4009.17	26.90	.67	3891.67	.00	.00
		Early	60		.081	4004.40	32.93	.82	3892.76	102.77	2.64
		10-17	1	7		3574.25	.00	.00	3714.81	.00	.00
		10-27	3	11	.000	3539.01	97.91	2.77	3620.40	.00	.00
		10-29	13	12	.230	3535.05	88.13	2.49	3616.62	145.10	4.01
		10-31	22	13	.530	3493.31	172.18	4.93	3495.88	202.45	5.79
		11- 3	6	14	.998	3450.65	154.99	2.23	3466.79	249.78	7.20
		11- 5	15	15	.804	3474.70	150.99	4.32	3358.70	268.24	7.99
		Mid	60		.594	3497.07	142.56	4.08	3494.69	212.98	6.09
		11- 7	19	1	.432	3312.51	140.41	4.24	3059.54	149.34	4.88
		11-10	1	2		3233.52	.00	.00	3046.79	.00	.00
		11-12	15	3	.325	3162.72	130.00	4.11	3059.54	156.21	5.22
		11-14	16	4	-.379	3061.35	210.34	6.87	3003.63	99.31	3.02

TABLE I (Continued)

Year	Market	Day and season	No. obs.	Market day	r	$\bar{X}$	Quality s	C	$\bar{Y}$	Local price s	C
1952	II	11-17	7	5	.000	2922.46	135.80	4.65	3027.72	.00	.00
		11-19	4	6	.000	3049.65	103.30	3.39	3023.21	.00	.00
		11-21	11	7	.193	3078.58	117.92	3.83	2869.29	119.40	4.17
		11-24	9	8	-.252	3127.38	155.17	4.96	2762.21	66.30	2.40
		11-26	2	9	.999	3095.06	158.22	5.11	2784.31	281.26	10.10
		11-28	4	10	.000	3047.34	128.44	4.21	2589.85	.00	.00
		12- 1	1	11		2885.21	.00	.00	2577.85	.00	.00
		12- 8	9	14	.300	3003.03	131.16	4.37	2621.15	44.84	1.71
		12-10	2	15	.000	3065.46	223.09	7.28	2734.20	.00	.00
		12-12	4	16	.000	2955.09	185.26	6.27	2588.78	.00	.00
		Late	104		.389	3110.61	1340.14	4.31	2910.72	183.67	6.31
		Yearly Total	224		.898	3453.53	397.22	1.15	3326.01	458.27	13.78
1952	III	9-12	66	1	.046	4008.11	23.25	.58	4157.20	24.49	.59
		9-15	57	2	.079	4011.00	21.89	.56	4070.11	29.04	.71
		9-17	41	3	.000	4050.00	38.87	.96	4112.64	.00	.00
		9-19	8	4	.955	4009.59	25.12	.63	4069.70	25.61	.63
		9-22	55	5	.001	4007.18	33.04	.82	3992.95	53.64	1.34
		9-24	90	6	.763	4011.74	44.96	1.12	3973.72	95.37	2.40
		9-26	72	7	.000	4015.32	28.60	.71	2017.58	.00	.00
		9-29	60	8	.440	3998.21	70.76	1.77	4033.09	39.37	.98
		10- 1	98	9	.091	4016.63	37.32	.93	3969.40	20.44	.51
		Early	547		.254	4013.47	41.41	1.03	4031.17	78.64	1.95
		10- 3	92	1	.704	3756.30	77.74	2.07	3768.19	61.84	1.64
		10- 6	20	2	.893	3764.42	98.84	2.52	3691.58	162.04	4.39
		10- 8	96	3	.746	3734.96	100.18	2.68	3702.64	127.17	3.43
		10-15	104	6	.558	3735.49	108.87	2.91	3749.08	101.25	2.70
		10-17	129	7	.667	3737.58	156.35	4.18	3756.84	145.09	3.86
		10-20	72	8	.440	3668.75	123.29	3.36	3672.97	106.20	2.86

TABLE I (Continued)

Year	Market	Day and Season	No. obs.	Market day	r	Quality			Local price		
						$\bar{X}$	s	C	$\bar{Y}$	s	C
1952	III	10-22	73	9	.320	3734.64	100.60	2.69	3730.38	79.17	2.12
		10-24	101	10	.327	3707.38	142.48	3.84	3709.33	96.38	2.60
		10-27	64	11	.706	3579.48	125.37	3.50	3597.84	170.50	5.50
		10-29	83	12	.185	3561.90	96.93	2.72	3663.10	86.00	2.35
		10-31	82	13	.384	3560.26	109.85	3.09	3594.72	84.81	2.36
		11- 3	33	14	.525	3457.98	96.91	2.80	3469.88	102.03	2.94
		11- 5	79	15	.387	3474.10	60.93	1.75	3493.69	114.43	3.28
		Mid	1028		.690	3663.93	149.97	4.09	3678.49	140.96	3.83
		11-10	74	2	.397	3302.52	75.38	2.28	3258.07	112.96	3.47
		11-12	23	3	.617	3141.62	122.42	3.90	3169.70	76.76	2.42
		11-14	45	4	.095	3136.81	106.64	3.40	3186.70	41.11	1.29
		11-17	32	5	.558	3093.16	161.08	5.21	3084.49	153.36	4.97
		11-19	1	6		2751.12	.00	.00	2922.43	.00	.00
		11-21	3	7	.413	3107.94	153.55	4.94	2963.12	115.35	3.89
		11-24	6	8	.897	3211.07	259.03	8.07	3151.92	347.13	11.01
		Late	184		.623	3196.32	149.26	4.67	3189.17	137.41	4.31
		Yearly Total	1759		.925	3723.71	270.74	7.27	3736.98	275.32	7.37
1952	IV	9-15	27	2	.280	3978.71	41.50	1.04	4145.30	46.42	1.12
		9-22	17	5	.000	3931.73	95.37	2.43	3960.56	.00	.00
		9-24	38	6	-.162	3976.49	45.60	1.15	4033.47	18.37	.46
		9-26	69	7	-.060	3984.97	32.43	.81	4032.14	22.98	.57
		9-29	47	8	.000	3939.29	129.19	3.28	4044.05	.00	.00
		10- 1	57	9	-.242	3746.73	160.63	4.29	3979.69	21.74	.55
		Early	255		.348	3917.73	137.73	3.52	4030.02	53.39	1.32
		10- 3	15	1	.000	3712.07	77.41	2.09	3741.43	.00	.00
		10- 6	55	2	-.049	3708.22	99.12	2.67	3780.37	12.90	.34
		10-15	20	6	.000	3594.87	83.16	2.31	3883.37	.00	.00
		10-17	30	7	.397	3561.75	104.67	2.94	3791.78	68.32	1.80

TABLE I (Continued)

Year	Market	Day and season	No. obs.	Market day	r	Quality			Local price		
						$\bar{X}$	s	C	$\bar{Y}$	s	C
1952	IV	10-20	44	8	.093	3552.00	78.97	2.22	3808.36	49.77	1.31
		10-22	33	9	-.220	3519.13	89.36	2.54	3782.78	36.80	.97
		10-27	61	11	.429	3531.02	199.28	5.64	3765.86	57.42	1.52
		10-29	29	12	.000	3520.99	127.11	3.61	3709.05	.00	.00
		10-31	2	13	.000	3471.17	.00	.00	3666.00	36.30	.99
		11- 5	1	15		3468.50	.00	.00	3687.64	.00	.00
		Mid	290		.197	3581.77	145.05	4.05	3779.85	57.71	1.53
		11- 7	4	1	.688	3368.91	69.53	2.06	3503.76	60.62	1.73
		11-10	10	2	.000	3393.24	82.94	2.44	3636.49	.00	.00
		11-19	3	6	.999	2944.27	101.83	3.46	3157.57	116.37	3.69
		Late	17		.910	3308.29	190.80	5.77	3501.57	188.72	5.39
		Yearly Total	562		.817	3725.93	230.63	6.19	3885.52	137.02	3.53
1952	V	9-12	46	1	.000	3984.75	39.08	.98	4064.82	.00	.00
		9-15	40	2	.000	3981.91	52.93	1.33	4075.35	.00	.00
		9-17	48	3	.000	3927.74	40.82	1.04	4112.64	.00	.00
		9-19	24	4	.000	3943.65	73.01	1.85	4007.09	.00	.00
		9-22	49	5	.000	3969.75	39.51	1.00	3960.56	.00	.00
		9-24	45	6	.000	3966.96	49.48	1.25	3991.46	.00	.00
		9-26	49	7	.000	3971.67	32.80	.83	4017.58	.00	.00
		10- 1	28	9	.000	3987.99	40.15	1.01	3917.14	.00	.00
		Early	329		-.175	3966.75	48.99	1.24	4023.70	58.69	1.46
		10- 3	58	1	.560	3714.32	60.37	1.63	3686.72	31.70	.86
		10-24	1	10		3443.98	.00	.00	3728.82	.00	.00
		10-29	122	12	.521	3548.82	102.87	2.90	3643.96	43.07	1.18
		10-31	10	13	.000	3491.95	107.13	3.15	3281.46	.00	.00
		11- 3	4	14	.000	3446.40	.00	.00	3262.87	.00	.00

TABLE I (Continued)

Year	Market	Day and season	No. obs.	Market day	r	Quality			Local price		
						$\bar{X}$	s	C	$\bar{Y}$	s	C
1952	V	11- 5	14	15	.000	3421.27	44.61	1.30	3324.07	.00	.00
		Mid	209		.627	3576.72	130.37	3.64	3610.17	129.15	3.58
		11- 7	1	1		3212.39	.00	.00	3082.35	.00	.00
		Late	1			3212.39	.00	.00	3082.35	.00	.00
		Yearly Total	539		.904	3814.11	211.66	5.55	3861.60	224.16	5.80
		Total 1952	3470		.872	3696.05	280.59	7.59	3745.48	297.59	7.95
1953	I	11-16	11	11	.000	3028.51	45.07	1.49	3030.78	.00	.00
		Mid	11		.000	3028.51	45.07	1.49	3030.78	.00	.00
		11-18	28	1	.965	3147.34	102.28	3.25	3107.52	62.93	2.03
		11-20	14	2	.972	3027.37	95.98	3.17	3033.53	88.62	2.92
		11-25	30	4	.944	2982.06	131.43	4.41	2877.57	180.39	6.27
		Late	72		.913	3055.14	135.34	4.43	2997.32	164.18	5.48
		Yearly Total	83		.896	3051.61	127.35	4.17	3001.76	153.34	5.11
1953	II	9-14	22	1	.000	3482.88	28.73	.82	3478.59	.00	.00
		9-16	56	2	.009	3460.71	71.53	2.07	3498.21	13.36	.38
		9-18	30	3	.863	3415.07	150.81	4.42	3444.10	81.11	2.36
		9-21	17	4	.146	3483.76	55.04	1.58	3485.81	20.97	.60
		9-23	29	5	.000	3481.01	52.22	1.50	3439.42	.00	.00
		9-25	45	6	.969	3361.53	165.47	4.92	3384.73	82.76	2.45
		9-28	68	7	.662	3332.26	156.51	4.70	3327.97	90.91	2.73
		9-30	41	8	.733	3435.65	76.75	2.23	3445.55	43.17	1.25
		10- 2	52	9	.951	3318.66	290.78	8.76	3334.94	250.84	7.52
		10- 5	9	10	.958	2857.49	477.29	16.70	2910.19	428.96	14.74
		10- 7	49	11	.937	3406.30	114.27	3.35	3414.59	167.69	4.91
		10- 9	28	12	.954	3418.90	162.76	4.76	3392.30	152.23	4.49

TABLE I (Continued)

Year	Market	Day and season	No. obs.	Market day	r	Quality			Local price		
						$\bar{X}$	s	C	$\bar{Y}$	s	C
1953	II	10-14	43	14	.000	3379.50	43.32	1.28	3405.24	.00	.00
		10-16	28	15	.951	3405.36	141.00	4.14	3378.57	63.25	1.87
		10-19	33	16	.743	333.72	138.88	4.17	3343.62	94.60	2.83
		10-21	44	17	.903	3361.81	159.53	4.75	3348.79	80.52	2.43
		Early	594		.820	3386.14	188.55	5.57	3392.69	145.25	4.28
		10-23	67	1	.801	3371.58	139.88	4.15	3367.62	79.25	2.35
		10-26	15	2	.000	3394.81	111.60	3.29	3406.50	.00	.00
		10-28	2	3		3066.98	.00	.00	3186.48	.00	.00
		10-30	50	4	.182	3292.78	125.13	3.80	3283.11	62.58	1.91
		11- 2	51	5	.834	3169.78	221.86	7.00	3231.66	96.93	3.00
		11- 4	32	6	.944	3289.01	87.64	2.84	3282.44	58.56	1.78
		11- 6	20	7	.866	3256.43	124.44	3.73	3256.18	100.27	3.08
		11- 9	33	8	.442	3070.36	152.93	4.98	3113.25	177.23	5.69
		11-13	26	10	.515	3099.11	183.19	5.91	3043.41	254.97	8.38
		11-16	14	11	.759	3160.32	153.16	4.85	3156.02	228.34	7.24
		Mid	310		.702	3244.41	186.93	5.76	3252.53	160.55	4.94
		11-18	42	1	.644	2943.75	198.36	6.74	2982.52	252.91	8.48
		11-20	16	2	.468	2971.43	156.32	5.26	3032.77	150.60	4.97
		11-27	31	5	.000	2556.71	157.51	2.16	2688.84	.00	.00
		11-30	41	6	.073	2736.88	133.88	4.89	2815.82	153.09	5.44
		12- 2	12	7	.681	2737.90	126.77	4.63	2734.57	129.77	4.75
		12- 9	1	10		2449.10	.00	.00	2605.23	.00	.00
		12-11	11	11	.000	2711.69	107.00	3.95	2621.42	.00	.00
		12-18	17	14	-.402	2657.44	97.00	3.65	2585.47	33.99	1.31
		Late	171		.645	2783.91	197.31	7.09	2811.70	216.95	7.72
		Yearly Total	1075		.891	3249.47	284.06	8.74	3259.85	261.36	8.02

TABLE I (Continued)

Year	Market	Day and season	No. obs.	Market day	r	Quality			Local price		
						$\bar{X}$	s	C	$\bar{Y}$	s	C
1953	III	9-14	25	1	.000	3489.92	15.98	.46	3478.59	.00	.00
		9-16	29	2	.952	3469.66	49.26	1.42	3486.21	51.76	1.48
		9-18	64	3	.685	3484.15	20.32	.58	3480.81	24.74	.71
		9-21	29	4	.000	3491.53	16.36	.47	3494.62	.00	.00
		9-23	29	5	.000	3485.00	20.54	.59	3489.27	.00	.00
		9-25	37	6	.000	3498.07	29.91	.86	3478.59	.00	.00
		9-28	44	7	.869	3456.84	58.01	1.68	3458.31	77.13	2.23
		9-30	49	8	.661	3485.87	29.74	.85	3501.30	28.59	.82
		10- 2	61	9	.000	3478.65	21.83	.63	3505.39	.00	.00
		10- 5	13	10	.000	3506.60	24.84	.71	3532.61	.00	.00
		10- 7	41	11	.900	3446.09	59.78	1.73	3456.98	86.19	2.49
		10- 9	62	12	.867	3461.87	49.53	1.43	3495.70	67.52	1.93
		10-14	54	14	.562	3498.32	46.91	1.34	3497.97	37.94	1.08
		10-16	44	15	.596	3491.02	36.05	1.03	3495.45	30.15	.86
		10-19	27	16	.253	3475.69	30.92	.89	3507.09	14.39	.41
		10-21	4	17	.000	3466.83	42.58	1.23	3439.42	.00	.00
		Early	612		.731	3481.08	41.17	1.18	3488.84	45.96	1.32
		10-23	10	1	.000	3460.60	33.98	.98	3456.60	.00	.00
		10-26	5	2	.000	3459.60	40.35	1.17	3456.60	.00	.00
		10-30	9	4	.284	3379.74	58.36	1.73	3440.07	44.21	1.29
		11- 2	2	5	.000	3386.46	77.93	2.30	3406.50	.00	.00
		11- 4	1	6		3441.25	.00	.00	3401.23	.00	.00
		11- 6	20	7	.615	3239.62	163.49	5.05	3175.91	173.20	5.45
		11-13	24	10	.591	3213.46	102.67	3.19	3213.37	129.79	4.04
		11-16	22	11	.791	3106.61	112.37	3.62	3087.71	154.29	5.00
		Mid	93		.825	3255.88	161.82	4.97	3243.07	186.28	5.74
		11-18	16	1	.963	3174.72	114.39	3.60	3165.36	153.55	4.85
		11-20	18	2	.883	3142.16	112.21	3.57	3139.13	152.08	4.84
		11-30	9	6	.934	2873.05	168.73	5.87	2864.74	258.06	9.01

TABLE I (Continued)

Year	Market	Day and season	No. obs.	Market day	r	Quality			Local price		
						$\bar{X}$	s	C	$\bar{Y}$	s	C
1953	III	12- 7	77	9		2613.81	.00	.00	2713.81	.00	.00
		Late	50		.949	3030.17	229.48	7.57	3038.59	233.65	7.69
		Yearly Total	755		.950	3423.48	156.46	4.57	3428.75	163.87	4.78
1953	IV	9-16	3	2		3435.00	.00	.00	3500.00	.00	.00
		9-18	10	3	.000	3459.04	33.67	.97	3483.92	.00	.00
		9-23	4	5	.000	3471.82	24.92	.72	3489.27	.00	.00
		9-25	5	6	.000	3477.60	44.78	1.29	3478.59	.00	.00
		9-28	4	7	.000	3434.72	35.34	1.03	3494.62	.00	.00
		9-30	7	8	.000	3405.96	30.13	.88	3505.39	.00	.00
		10- 5	28	10	.424	3454.57	41.31	1.20	3525.40	26.89	.76
		10- 7	3	11	.000	3435.57	.00	.00	3510.80	.00	.00
		10- 9	39	12	.000	3472.53	35.66	1.03	3521.67	.00	.00
		10-14	23	14	.000	3466.64	30.47	.88	3505.39	.00	.00
		10-16	15	15	.000	3429.00	42.86	1.25	3500.00	.00	.00
		10-19	8	16	-.408	3439.33	45.80	1.33	3504.53	17.73	.51
		10-21	9	17	-.112	3449.94	38.93	1.13	3444.96	18.98	.55
		Early	158		.141	3455.35	39.56	1.14	3506.07	23.63	.67
		10-23	14	1	.000	3455.16	32.68	.95	3456.60	.00	.00
		10-28	13	3	.000	3474.87	24.57	.71	3435.42	.00	.00
		11- 4	8	6	.000	3384.98	68.89	2.04	3401.23	.00	.00
		11- 6	6	7	.000	3399.17	29.41	.87	3411.71	.00	.00
		11-13	3	10	.500	3206.01	130.37	.41	3104.72	179.50	5.78
		Mid	44		.778	3432.60	82.30	2.40	3410.16	93.47	2.74
		11-20	20	2	.510	3205.88	61.35	1.91	3216.78	99.07	3.08
		Late	20		.510	3205.88	61.35	1.91	3216.78	99.07	3.08
		Yearly Total	222		.822	3426.59	88.07	2.57	3461.00	101.47	2.93

TABLE I (Continued)

Year	Market	Day and season	No. obs.	Market day	r	Quality			Local price		
						$\bar{X}$	s	C	$\bar{Y}$	s	C
1943	V	9-14	1	1		3369.27	.00	.00	3428.90	.00	.00
		9-25	5	6	-.408	3002.52	21.78	.73	3264.91	133.34	4.08
		9-28	1	7		3369.82	.00	.00	3385.79	.00	.00
		9-30	6	8	.388	3396.06	35.50	1.05	3398.73	37.32	1.10
		10- 7	4	11		3024.30	.00	.00	3209.88	.00	.00
		10-14	1	14		3375.19	.00	.00	3386.21	.00	.00
		10-21	2	17	.999	3404.52	42.30	1.24	3388.08	24.74	.73
		Early	20		.747	3220.48	195.04	6.06	3326.68	104.84	3.15
		10-28	2	3	.000	3360.74	28.32	8.43	3350.78	.00	.00
		10-30	1	4		3241.22	.00	.00	3202.33	.00	.00
		11- 6	5	7	.953	3217.05	197.73	6.15	3165.87	248.48	7.85
		11- 9	10	8	.418	3076.12	38.77	1.26	3171.25	94.61	2.99
		11-16	20	11	.082	3021.77	130.85	4.33	3173.66	99.94	3.15
		Mid	38		.457	3085.38	148.73	4.82	3182.08	123.39	3.88
		11-18	42	1	.000	3088.35	157.23	5.09	3196.57	.00	.00
		11-20	17	2	.000	3008.02	181.72	6.04	3172.17	.00	.00
		11-23	5	3	-.994	2981.84	17.78	.60	2933.07	33.71	1.15
		11-30	43	6	.950	2721.84	170.68	6.27	2772.36	149.52	5.39
		12- 4	36	8	.929	2960.11	284.62	9.62	3000.22	284.47	9.48
		12- 7	7	9	-.330	2603.97	102.44	3.93	2681.07	32.92	1.23
		12-11	1	11	.000	2591.17	.00	.00	2647.43	.00	.00
		12-14	16	12	.702	2581.71	152.47	5.91	2703.08	90.65	3.35
		12-21	14	15	.000	2582.59	80.58	3.12	2594.24	.00	.00
		Late	181		.886	2859.90	266.93	9.33	2934.22	258.76	8.82
		Yearly Total	239		.885	2925.93	274.05	9.37	3006.47	267.28	8.89
		Total 1953	2374		.924	3281.88	276.80	8.43	3297.84	262.05	7.95

Note: The figures in the column headings are r, correlation coefficient between quality and local price; $\bar{X}$, mean of quality for the specified time period; $\bar{Y}$, mean of local price for the specified time period; s, one standard deviation of quality or local price for a specified period; C, relative variation of quality or local price for a specified time period.

TABLE II
CONVERSION TABLE OF DATES TO MARKET DAYS

Market days	1951			1952			1953		
	Early season	Mid season	Late season	Early season	Mid season	Late season	Early season	Mid season	Late season
1									
1	Sept. 24	Oct. 29	Nov. 28	Sept. 12	Oct. 3	Nov. 7	Sept. 14	Oct. 23	Nov. 18
2	Sept. 26	Oct. 31	Nov. 30	Sept. 15	Oct. 6	Nov. 10	Sept. 16	Oct. 26	Nov. 20
3	Sept. 28	Nov. 2	Dec. 3	Sept. 17	Oct. 8	Nov. 12	Sept. 18	Oct. 28	Nov. 23
4	Oct. 1	Nov. 5	Dec. 5	Sept. 19	Oct. 10	Nov. 14	Sept. 21	Oct. 30	Nov. 25
5	Oct. 3	Nov. 7	Dec. 7	Sept. 22	Oct. 13	Nov. 17	Sept. 23	Nov. 2	Nov. 27
6	Oct. 5	Nov. 9	Dec. 10	Sept. 24	Oct. 15	Nov. 19	Sept. 25	Nov. 4	Nov. 30
7	Oct. 8	Nov. 12	Dec. 12	Sept. 26	Oct. 17	Nov. 21	Sept. 28	Nov. 6	Dec. 2
8	Oct. 10	Nov. 14	Dec. 14	Sept. 29	Oct. 20	Nov. 24	Sept. 30	Nov. 9	Dec. 4
9	Oct. 12	Nov. 16	Dec. 17	Oct. 1	Oct. 22	Nov. 26	Oct. 2	Nov. 11	Dec. 7
10	Oct. 15	Nov. 19	Dec. 19		Oct. 24	Nov. 28	Oct. 5	Nov. 13	Dec. 9
11	Oct. 17	Nov. 21	Dec. 21		Oct. 27	Dec. 1	Oct. 7	Nov. 16	Dec. 11
12	Oct. 19	Nov. 23	Dec. 24		Oct. 29	Dec. 3	Oct. 9		Dec. 14
13	Oct. 22	Nov. 26	Dec. 26		Oct. 31	Dec. 5	Oct. 12		Dec. 16
14	Oct. 24		Dec. 28		Nov. 3	Dec. 8	Oct. 14		Dec. 18
15	Oct. 26				Nov. 5	Dec. 10	Oct. 16		Dec. 21
16						Dec. 12	Oct. 19		
17							Oct. 21		

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Local identifier

Source information

Identifier	Microfilm reel# T1958-98-T1958-109
Format	Microfilm
Content type	Text
Notes	

Capture information

Date captured	2019
Scanner manufacturer/model	ScanPro 3000 /e-ImageData
Scanning software	PowerScan 3000(TM) v5.341
Optical resolution	600 dpi
Compression	LZW
Color settings	bitonal
File types	tiff
Notes	Scanned from microfilm; no editing done.

Derivatives - Access copy

Editing software	Photoshop
Resolution	600 dpi
Color	grayscale
File types	pdf
Notes	Converted from tiff to pdf using Adobe Acrobat Pro DC.