

RELATION OF ARIZONA COTTON PRICES ON THE PHOENIX MARKET
TO QUALITY OF COTTON AND OTHER MAJOR FACTORS

by

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TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION.....	1
A. Purpose and Scope of Study.....	1
B. Source of Data.....	1
1. Local Buyers.....	1
2. Recapitulation Sheets.....	2
3. USDA Statistical Bulletins.....	3
C. Method of Analysis.....	3
D. Previous Research Programs.....	3
E. Periodic Movements in Production and Quality of Arizona Cotton.....	4
1. Production.....	4
a. Arizona Cotton Production.....	4
b. National Cotton Production.....	4
2. Quality.....	9
a. Grade Distribution Bi-weekly Intervals and Annual 1951.....	10
b. Staple Distribution Bi-weekly Intervals and Annual 1951.....	18
c. Arizona Grade Index for Several Years.....	26
d. Arizona Staple Length for Several Years.....	28
II. THE GOVERNMENT COTTON CLASSING SYSTEM.....	32
III. THE RELATIONSHIP BETWEEN PHOENIX AND CENTRAL MARKET COTTON PRICES.....	40
A. Efficiency of the Phoenix Market in Reflecting Central Market Premium and Discounts for Quality.....	40

Chapter	Page
III. (Continued)	
B. Factors Influencing Spreads Between Local and Central Markets.....	59
1. Cost of Moving Cotton.....	59
a. Phoenix to Group B.....	59
b. Memphis to Group B.....	59
2. Other Costs.....	62
IV. SUMMARY AND CONCLUSIONS.....	63
V. BIBLIOGRAPHY.....	65
VI. APPENDIX.....	66

LIST OF TABLES

Number		Page
I.	ACREAGE OF ALL COTTON IN ARIZONA AND THE UNITED STATES, 1940-1951 INCLUSIVE.....	5
II.	PRODUCTION OF ALL COTTON IN ARIZONA AND THE UNITED STATES, 1940-1951 INCLUSIVE.....	7
III.	YIELDS OF ALL COTTON IN ARIZONA AND THE UNITED STATES, 1940-1951 INCLUSIVE.....	8
IV.	PERCENTAGE DISTRIBUTION OF GRADES IN ARIZONA UPLAND COTTON GINNINGS, 1928-1951 AVERAGE AND 1951.....	11
V.	GRADE DISTRIBUTION OF UPLAND COTTON GINNED PRIOR TO SPECIFIED DATES, ARIZONA, AVERAGE OF CROP YEARS 1928-1951.....	27
VI.	DISTRIBUTION IN STAPLE LENGTH OF UPLAND COTTON GINNED PRIOR TO SPECIFIED DATE, ARIZONA, AVERAGE OF CROP YEARS 1928-1951.....	28
VII.	GINNINGS OF ARIZONA UPLAND COTTON PRIOR TO SPECIFIED DATE.....	30
VIII.	UNIVERSAL STANDARDS FOR GRADES OF AMERICAN UPLAND COTTON.....	33
IX.	CORRELATION BETWEEN AMERICAN UPLAND COTTON PRICES AT PHOENIX AND MEMPHIS, THURSDAYS, 1951 CROP YEAR.....	60
X.	COMPARATIVE COSTS MOVING COTTON TO GREENVILLE, SOUTH CAROLINA, AUGUST 28, 1951.....	62

LIST OF FIGURES

Number		Page
I.	AVERAGE GRADE DISTRIBUTION OF UPLAND COTTON GINNED IN ARIZONA, 1928-1951.....	10
II.	ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON GRADING STRICT MIDDLING THROUGH SPECIFIED DATES, ARIZONA, 1943-1951.....	12
III.	ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON GRADING MIDDLING THROUGH SPECIFIED DATES, ARIZONA, 1943-1951.....	14
IV.	ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON GRADING STRICT LOW MIDDLING THROUGH SPECIFIED DATES, ARIZONA, 1943-1951.....	15
V.	ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON GRADING LOW MIDDLING AND BELOW, THROUGH SPECIFIED DATES, ARIZONA, 1943-1951.....	16
VI.	ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON GRADING SPOT THROUGH SPECIFIED DATES, ARIZONA, 1943-1951.....	17
VII.	AVERAGE DISTRIBUTION IN STAPLE LENGTH OF UPLAND COTTON GINNED IN ARIZONA, 1943-1951.....	19
VIII.	ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON 31/32 INCH STAPLE LENGTH THROUGH SPECIFIED DATES, ARIZONA, 1943-1951.....	20
IX.	ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON 1 INCH STAPLE LENGTH THROUGH SPECIFIED DATES, ARIZONA, 1943-1951.....	21
X.	ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON 1 1/32 INCH STAPLE LENGTH THROUGH SPECIFIED DATES, ARIZONA, 1943-1951.....	22
XI.	ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON 1 1/16 INCH STAPLE LENGTH THROUGH SPECIFIED DATES, ARIZONA, 1943-1951.....	24

Number		Page
XII.	ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON 1 3/32 INCH STAPLE LENGTH THROUGH SPECIFIED DATES, ARIZONA, 1943-1951.....	25
XIII.	GRADE INDEX OF ARIZONA UPLAND COTTON THROUGH SPECIFIED DATES, ARIZONA, 1943-1951.....	26
XIV.	CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS, OCTOBER 4, 1951.....	42
XV.	CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS, OCTOBER 18, 1951.....	43
XVI.	CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS, OCTOBER 25, 1951.....	44
XVII.	CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS, NOVEMBER 1, 1951.....	45
XVIII.	CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS, NOVEMBER 8, 1951.....	46
XIX.	CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS, NOVEMBER 15, 1951.....	47
XX.	CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS, NOVEMBER 21, 1951.....	48
XXI.	CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS, NOVEMBER 29, 1951.....	49
XXII.	CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS, DECEMBER 13, 1951.....	50
XXIII.	CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS, DECEMBER 20, 1951.....	51

Number		Page
XXIV.	CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS, DECEMBER 27, 1951.....	52
XXV.	CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS, JANUARY 10, 1952.....	53
XXVI.	CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS, JANUARY 24, 1952.....	54
XXVII.	CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS, FEBRUARY 7, 1952.....	55
XXVIII.	CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS, FEBRUARY 14, 1952.....	56
XXIX.	CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS, FEBRUARY 21, 1952.....	57
XXX.	CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS, MARCH 13, 1952.....	58

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CHAPTER I

INTRODUCTION

Purpose and Scope of the Study

The Phoenix cotton market is located in the approximate center of the state of Arizona, many miles away from seaboard and Carolina mill point markets. This situation causes many types of allegations to arise concerning the possibility that Arizona cotton does not receive a comparable price for quality and other factors that the markets nearer the above-mentioned markets do. The over-all goal of this study is to either confirm or deny these assertions.

The specific purposes of this study are: (1) to study the relationship of Arizona cotton prices on the Phoenix market to quality of cotton and other major factors; (2) to determine the relationship between the average prices in the local and central markets; (3) to determine causes of difference in prices, if any, between local and central markets; and (4) to discover the presence of any regular periodic movements which may exist in the production, prices and quality of Arizona cotton.

Sources of Data

There were three major sources of data for this study: Gin managers and other officials of cotton companies who acted as selling agents for Central Arizona farmers constituted the first source of data. These agents made their various records of sales available so that any needed information could be extracted. A copy of the schedule that was used in

this operation can be found in the Appendix, Table I. This recapitulation sheet contains the following:

- (1) Date of sale.
- (2) Producing region.
- (3) Variety of cotton.
- (4) The staple length (from 15/16 inch to 1-1/8 inch).
- (5) The total number of bales of each staple.
- (6) The grade of cotton.
- (7) The total number of bales of each grade.
- (8) The total bales of cotton.
- (9) The New York futures market on which the price was fixed.
- (10) The number of points on or off of New York futures.
- (11) The price per pound for the cotton sold.
- (12) Any pertinent remarks about the cotton that was sold.

This data was gathered in connection with Southern Regional Marketing Research Project SM-1 (Revised), Regional Marketing of Cotton, Cotton Seed and Cottonseed Products; Sub-project Number 1; Factors Affecting Cotton Prices in Local Markets. A second source of data was the various bulletins that the Production Marketing Administration of the United States Department of Agriculture makes available to anyone desiring this information. Many types of information can be obtained from these bulletins of which the following are examples: The percentage of sales by each grade and staple length, yearly production of cotton for both Arizona and the United States, the price of cotton for each grade and staple length, ginnings of cotton both accumulative and non-accumulative as of date of publication and the grade index for cotton. The United States

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Department of Agriculture Statistical bulletins constituted the third source of data for this study. Information obtained from this source included: Cotton acreages, yields per acre, total value of cotton and cotton by-products, and the total number of bales sold each year.

Method of Analysis

To determine the relationship between average prices in the local and central markets, a correlation was made using as variables weekly Phoenix cotton prices and the equivalent central market (Memphis) prices. Price spreads between local and central markets were examined after adjusting both prices for costs of moving the cotton to Carolina mill points. Finally, to discover the presence of any regular periodic movements which may exist in the production, price and quality of Arizona cotton, seasonal indices for these factors were computed.

Previous Research Programs

Several studies similar to this one were carried on in the southern cotton-producing states a number of years ago. No study of this type has previously been made in the state of Arizona, although, at the present time, there is one in progress directed by Mr. James S. St. Clair, Assistant Agricultural Economist, University of Arizona. The Arizona study is being carried on in conjunction with similar studies in the southern cotton-producing areas. Cooperating states include: Alabama, Arkansas, Georgia, Louisiana, Mississippi, Missouri, New Mexico, Oklahoma, South Carolina, Tennessee and Texas. One may observe that the cooperating states include most of the southern cotton belt.

Other studies that have been carried on in the past are as follows:

"Farm Prices and Quality of Missouri Cotton," Research Bulletin 233, 1936, Agricultural Experiment Station, University of Missouri; "Relation of Farm Prices to Quality of Cotton," Bulletin 383, 1928, Texas Agricultural Experiment Station; "Price-Quality Relationship in Farmers' Cotton Markets of Texas," Bulletin 501, 1934, Texas Agricultural Experiment Station and "Cotton Price-Quality Relationships in Local Markets of Louisiana," Bulletin No. 221, 1931, Louisiana State University. All of these are old, therefore, there is a definite need for a more current study in this field.

Periodic Movements in Production and Quality of Arizona Cotton

Production of Arizona Cotton: To compare (trends in) Arizona cotton production with those in the entire United States, indices of acreage, yield and production were computed for Arizona and the United States, respectively. The comparison between Arizona and United States production trends is facilitated by the use of index numbers, making 1940 the base year for both areas.

Table I compares total cotton acreages in Arizona with those in the U. S. for the years 1940 through 1951. Since 1940 was used as the base year, the index for both Arizona and the U. S. will be 100.00 for the year 1940. However, it can be seen that the Arizona cotton acreage index is higher than the U. S. index for the years 1941, 1942, and 1943. In 1944 a second period begins, one in which the U. S. cotton acreage index ranks higher than the Arizona index. This period lasts until the year 1947, in which the third and final period is entered. This period, 1947 through 1951, is one in which, once again the Arizona cotton acreage index greatly outranks the U. S. index. At the end of the final period,

TABLE I
ACREAGE OF ALL COTTON IN ARIZONA AND THE
UNITED STATES, 1940-1951 INCLUSIVE

	<u>Harvested Arizona Acreage^{1/} (1,000)</u>	<u>Arizona Acreage Index</u>	<u>Harvested U. S. Acreage^{1/} (1,000)</u>	<u>U. S. Acreage Index</u>
1940	221	100.00	24,871	100.00
1941	255	115.38	23,130	93.00
1942	274	123.98	23,302	93.69
1943	204	92.31	21,900	88.05
1944	145	65.61	19,990	80.37
1945	154	69.68	17,558	70.60
1946	145	65.61	18,251	73.38
1947	226	102.26	21,611	86.89
1948	282	127.60	23,264	93.54
1949	386	174.66	27,914	112.24
1950	280	126.70	18,629	74.90
1951	548	247.97	27,917	112.25

^{1/} Statistics on Cotton and Related Data, United States Department of Agriculture, Bureau of Agricultural Economics, Bulletin Number 99, June, 1951.

it should be noted that the Arizona cotton acreage index is more than double the U. S. index. These figures are quite significant in that they indicate the rapid growth of the cotton industry in Arizona since 1940.

Table II compares the number of bales produced, in the form of indices, for Arizona to that of the U. S. Again the year 1940 was used as the base year and the index for both Arizona and the U. S. will remain 100.00 for the year 1940. In the year 1941, Arizona cotton production index outranked that of the U. S. However, in 1942, the U. S. cotton bale production outranked that of Arizona. This continued until the period 1946 through 1951, when the Arizona cotton production index, once again, was larger than that of the U. S. Arizona production indices have climbed even more rapidly than the acreage indices of Table I in the latter years, indicating that yields as well as acreages have risen sharply in Arizona.

Table III compares the yield of Arizona cotton, in the form of indices, to that of the U. S. Once again the year 1940 was the base year and the indices for that period are 100.00. In the period 1941 through 1945 the U. S. yield index is greater than Arizona by a substantial margin. However, in the period 1946 through 1951, the Arizona yield index outranks the U. S. by an even greater figure than the U. S. outranked Arizona in the first period. These figures tend to prove the statement, "Arizona cotton and cotton production is of a growing importance to the state of Arizona," true to an even greater extent.

The period 1940 through 1945 is a period in which U. S. cotton acreage, cotton production and cotton yield indices generally outrank that of Arizona. However, in the period 1946 through 1951, the Arizona

TABLE II
 PRODUCTION OF ALL COTTON IN ARIZONA
 AND THE UNITED STATES, 1940-1951

	Arizona Bales Produced ^{2/} <u>Running Bales</u> 500 lb. Bales	Arizona Index (1940 = 100)	U. S. Production ^{2/} <u>Running Bales</u> 500 lb. Bales	U. S. Index (1940 = 100)
1940	195,000	100.00	12,566,000	100.00
1941	181,000	92.82	10,744,000	85.50
1942	193,000	98.98	12,817,000	102.00
1943	131,000	68.20	11,427,000	99.00
1944	136,000	69.74	12,230,000	97.48
1945	117,000	60.00	9,015,000	71.74
1946	158,000	81.02	8,640,000	68.04
1947	234,000	120.00	11,860,000	94.46
1948	328,000	168.87	14,877,000	118.39
1949	543,000	278.47	16,128,000	128.35
1950	474,000	244.20	10,012,000	79.68
1951	803,000	422.05	15,130,000	120.40

^{2/} Ibid. Page 5.

TABLE III
 YIELDS OF ALL COTTON IN ARIZONA AND THE
 UNITED STATES, 1940-1951 INCLUSIVE

	Arizona Lint Yield Per Acre Harvested ^{3/} <u>(Pounds)</u>	Arizona Yield Index <u>(1940 = 100)</u>	U. S. Lint Yield Per Acre Harvested ^{3/} <u>(Pounds)</u>	U. S. Yield Index <u>(1940 = 100)</u>
1940	423	100.00	248.0	100.00
1941	344	81.06	227.2	91.61
1942	339	80.14	268.3	108.19
1943	308	71.16	250.6	101.05
1944	450	106.38	293.8	118.47
1945	363	85.80	246.0	99.19
1946	521	123.17	227.1	91.17
1947	495	176.02	263.2	106.14
1948	556	131.44	306.6	123.63
1949	672	158.86	277.0	111.29
1950	825	195.04	261.5	105.44
1951	705	166.67	259.7	104.72

^{3/} Ibid. Page 5.

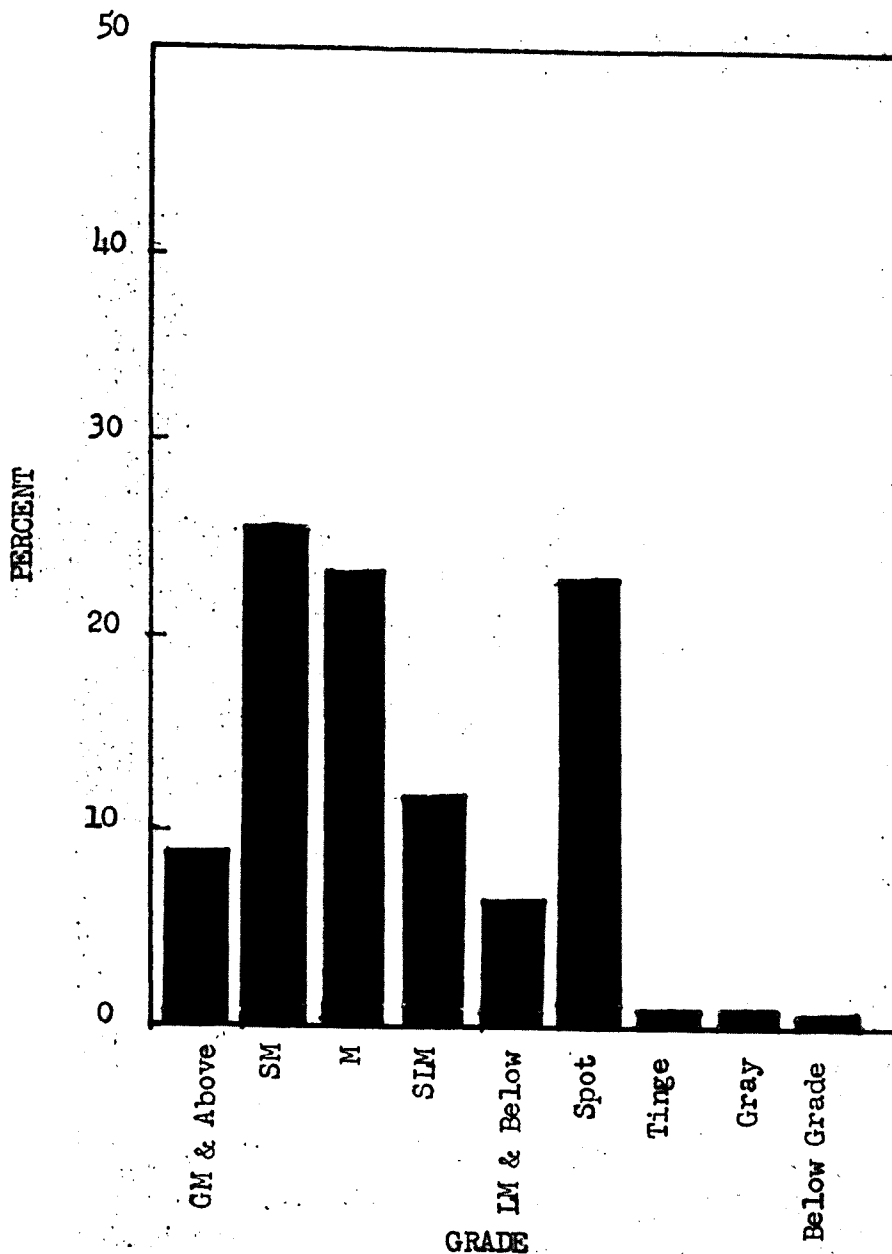
cotton begins to rise as a major industry in Arizona. In this period, Arizona cotton acreage, cotton production and cotton yield indices outrank that of the U. S. by substantial margins.

Quality of Arizona Cotton: It was necessary to confine the study of quality primarily to the two main factors of classers' grade and staple, although some mention is made of other fiber measurements in a later chapter. Both of these factors tend to have major effects upon prices received for cotton in any market in the United States, but as this study indicates at a later point, the degree of recognition of these quality factors varies at different market levels.

Grade: Table IV and Figure I compare the grade distribution for the 1951 crop year to the average grade distribution for the period 1928 through 1951. These figures indicate that quality of cotton for the crop year 1951, from the standpoint of grade, was lower than the average of the years 1928 through 1951. It is difficult to isolate the effect this lowering of grade had upon price, if any, because of the unusual circumstances that occurred during the period 1928 through 1951. These occurrences were the major depression of the 1930's and World War II in the early 1940's.

Figure II indicates the average seasonal movement in the proportion of the Arizona Upland crop grading Strict Middling during the years 1943-1951. The percentage of ginnings grading Strict Middling increase, on the average, very rapidly until September 15. From this date forward, until the end of the crop year, there is a general downward trend at all times. This chart is significant because it indicates that the better grades of cotton are harvested and ginned at the beginning of the harvesting season and as the season progresses, a much smaller percentage of

FIGURE I
 AVERAGE GRADE DISTRIBUTION OF UPLAND COTTON GINNED
 IN ARIZONA, 1928-1951. ^{5/}



^{5/} Cotton Quality Report for Ginnings, Western Upland Cotton, Sept. 15, 1944-March 20, 1952. United States Department of Agriculture, Production Marketing Administration, Phoenix, Arizona

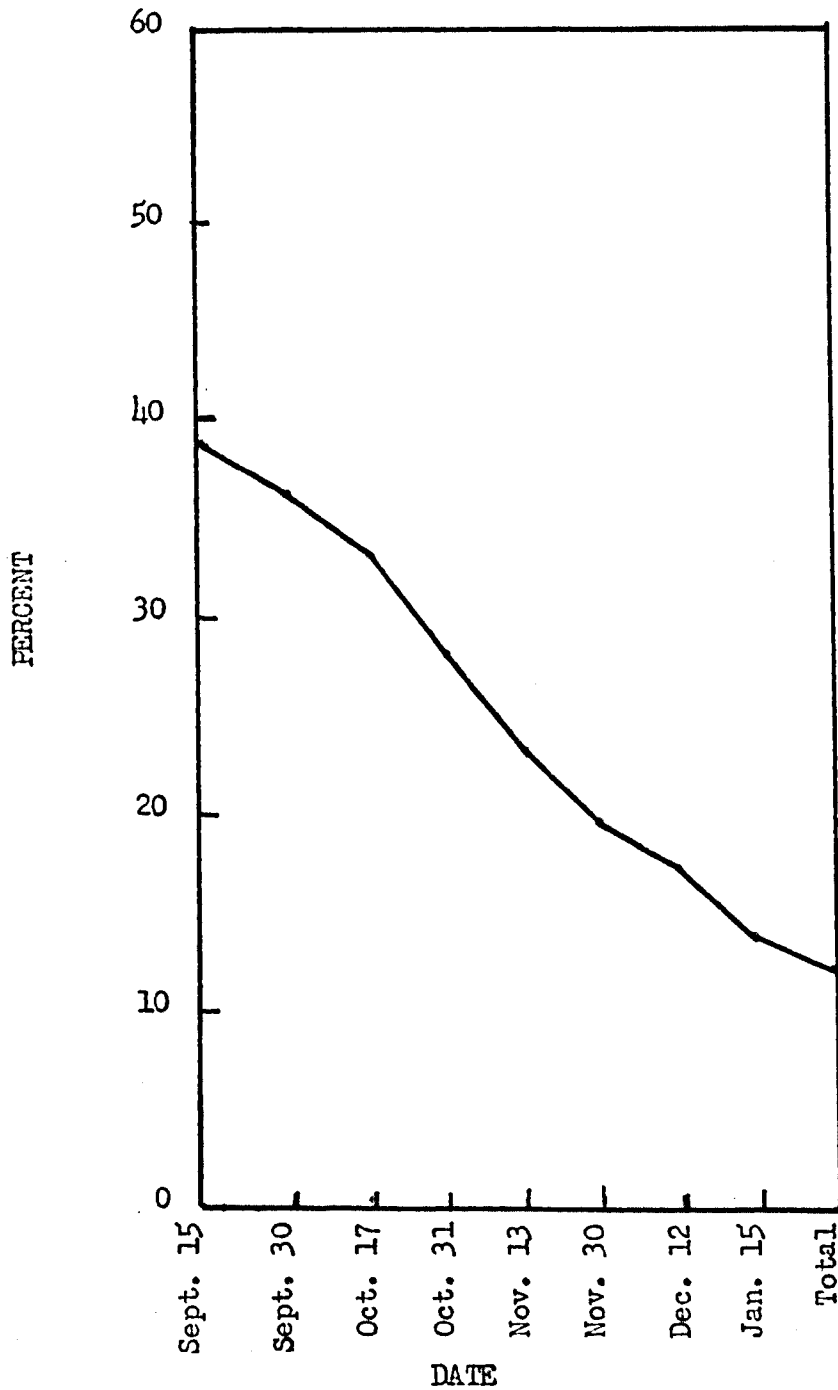
TABLE IV
 PERCENTAGE DISTRIBUTION OF GRADES IN ARIZONA UPLAND
 COTTON GINNINGS, 1928-1951 AVERAGE AND 1951.

<u>Grade</u>	<u>Average Crop Years 1928-1951 (Percent)</u>	<u>1951 Crop Year (Percent)</u>
GM and Above	8.87	.27
SM	25.55	12.01
M	23.12	27.66
SIM	11.70	17.88
LM and Below	6.45	10.50
Spot	22.83	28.17
Tinge	.85	1.03
Gray	.91	1.90
Below Grade	.67	.90

^{4/} Cotton Quality Statistics, United States, 1928-1951 issues, Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.

FIGURE II

ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON
 GRADING STRICT MIDDLING THROUGH SPECIFIED DATES,
 ARIZONA, 1943-1951. ^{6/}



^{6/} Ibid. Page 10.

these better grades are present.

Figure III indicates the average seasonal movement in the proportion of the Arizona Upland cotton crop grading Middling for the period 1943-1951. The proportion of ginnings grading Middling, on the average, vary little during the ginning season. The figures also indicate that Middling grade is the Modal grade for Arizona cotton.

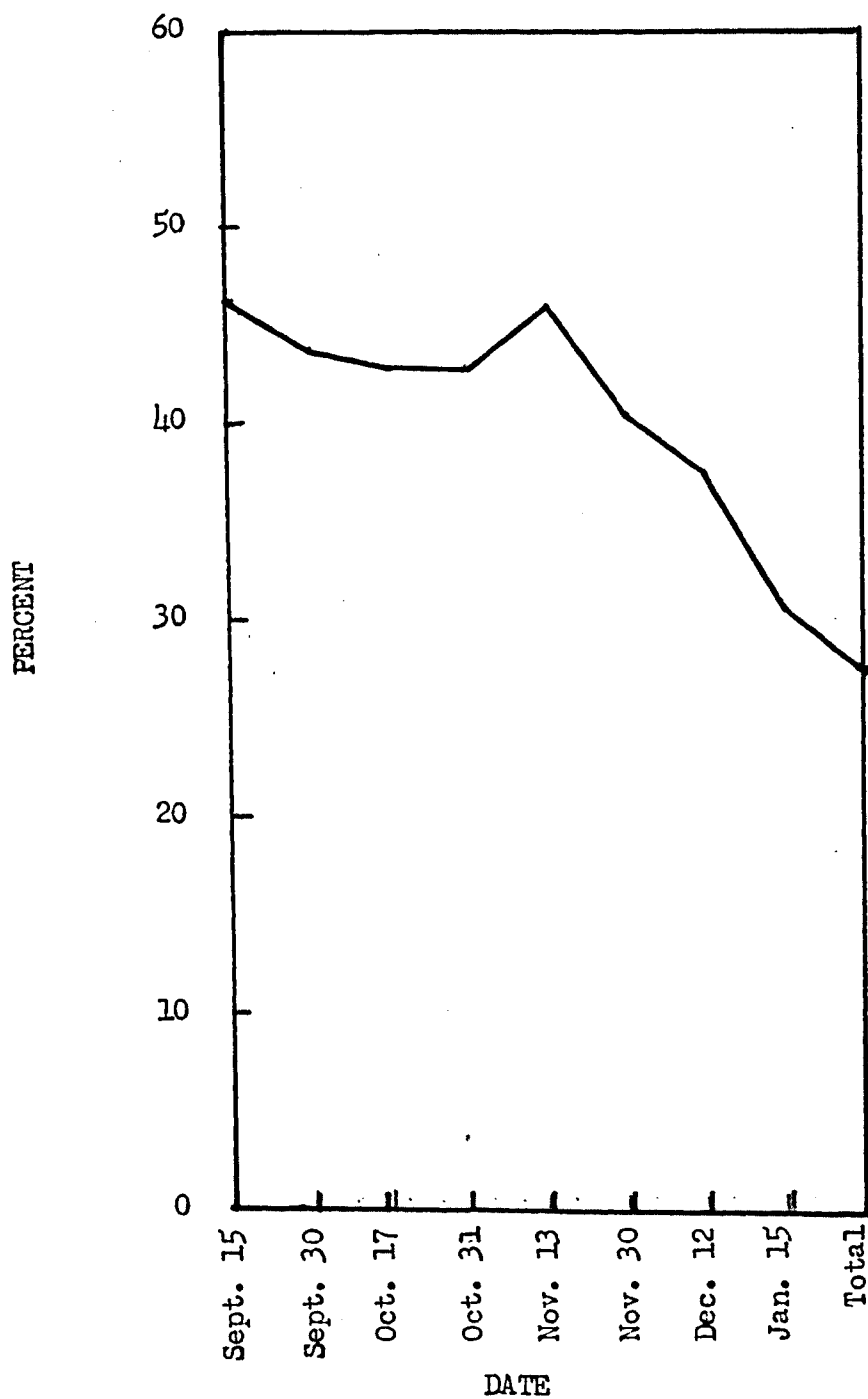
Figure IV indicates the average seasonal movement in the proportion of the Arizona Upland cotton crop grading Strict Low Middling for the period 1943-1951. This graphic presentation shows that at the beginning of the season, the percentage of Strict Low Middling cotton is very low. From this point forward, there is a general upward trend in the proportion of ginnings grading Strict Low Middling. Several factors tend to cause this small proportion of this grade at the beginning of the year compared with a larger proportion at the end of the year. These factors are as follows: (1) mechanical picking, (2) deterioration of the cotton in the boll on the stalk because of weather influences and (3) rough harvesting practices toward the end of the season.

Figure V indicates the average seasonal movement in the proportion of the Arizona Upland cotton crop grading Low Middling and Below (Strict Good Ordinary and Good Ordinary) for the period 1943-1951. The proportions of these grades are comparatively low throughout most of the season, but there is a sharp increase of these grades at the end of the year. A very desirable goal in producing cotton in Arizona is to keep the proportion of these grades as low as possible because as previously stated, the lowering in grade has a corresponding effect on prices.

Figure VI indicates the average seasonal movement in the proportion of the Arizona Upland cotton crop which falls into the Spotted grades for

FIGURE III

ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON
GRADING MIDDLING THROUGH SPECIFIED DATES,
ARIZONA, 1943-1951. ^{7/}



^{7/} Ibid. Page 10.

FIGURE IV

ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON
GRADING STRICT LOW MIDDLING THROUGH SPECIFIED DATES, ARIZONA,
1943-1951. 8/

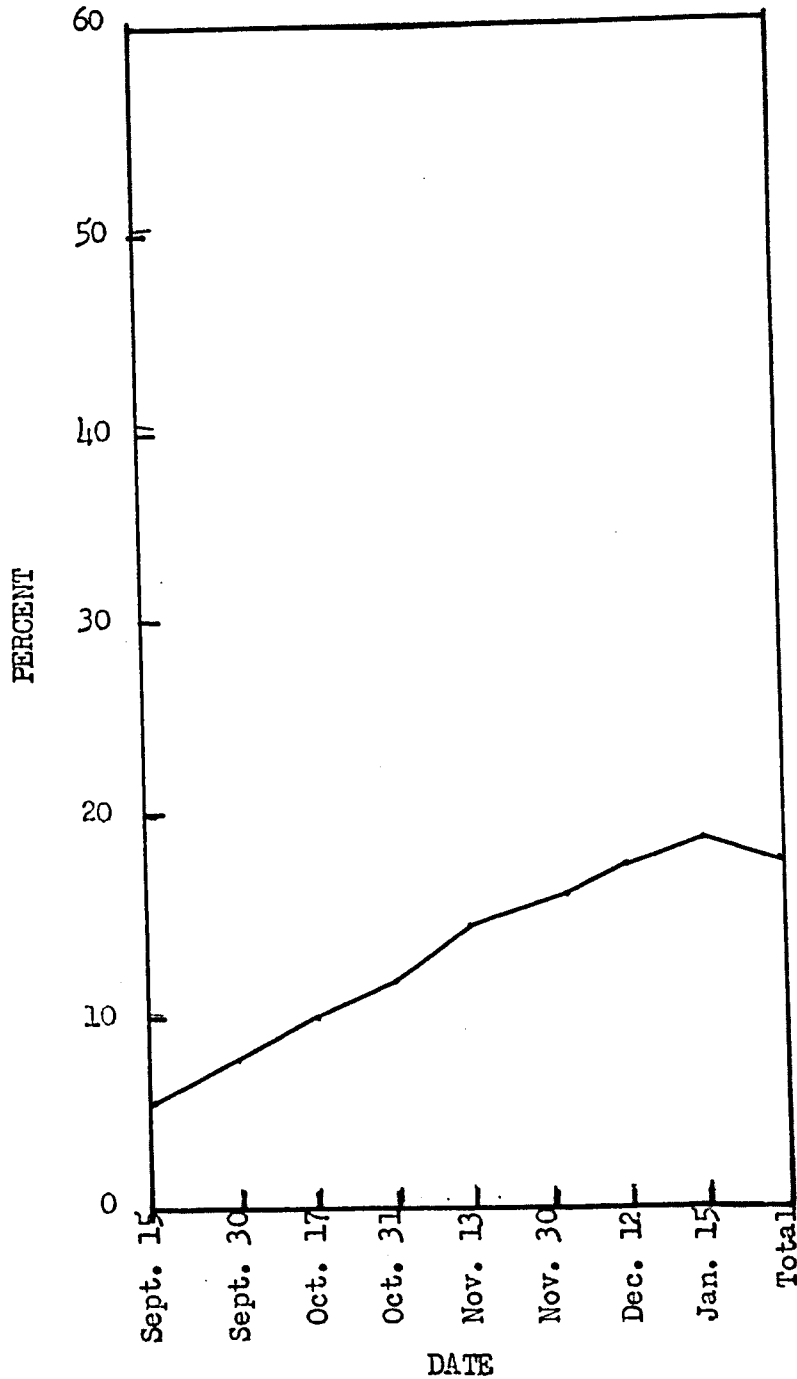


FIGURE V

ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON
GRADING LOW MIDDLING AND BELOW THROUGH SPECIFIED DATES,
ARIZONA, 1943-1951. 9/

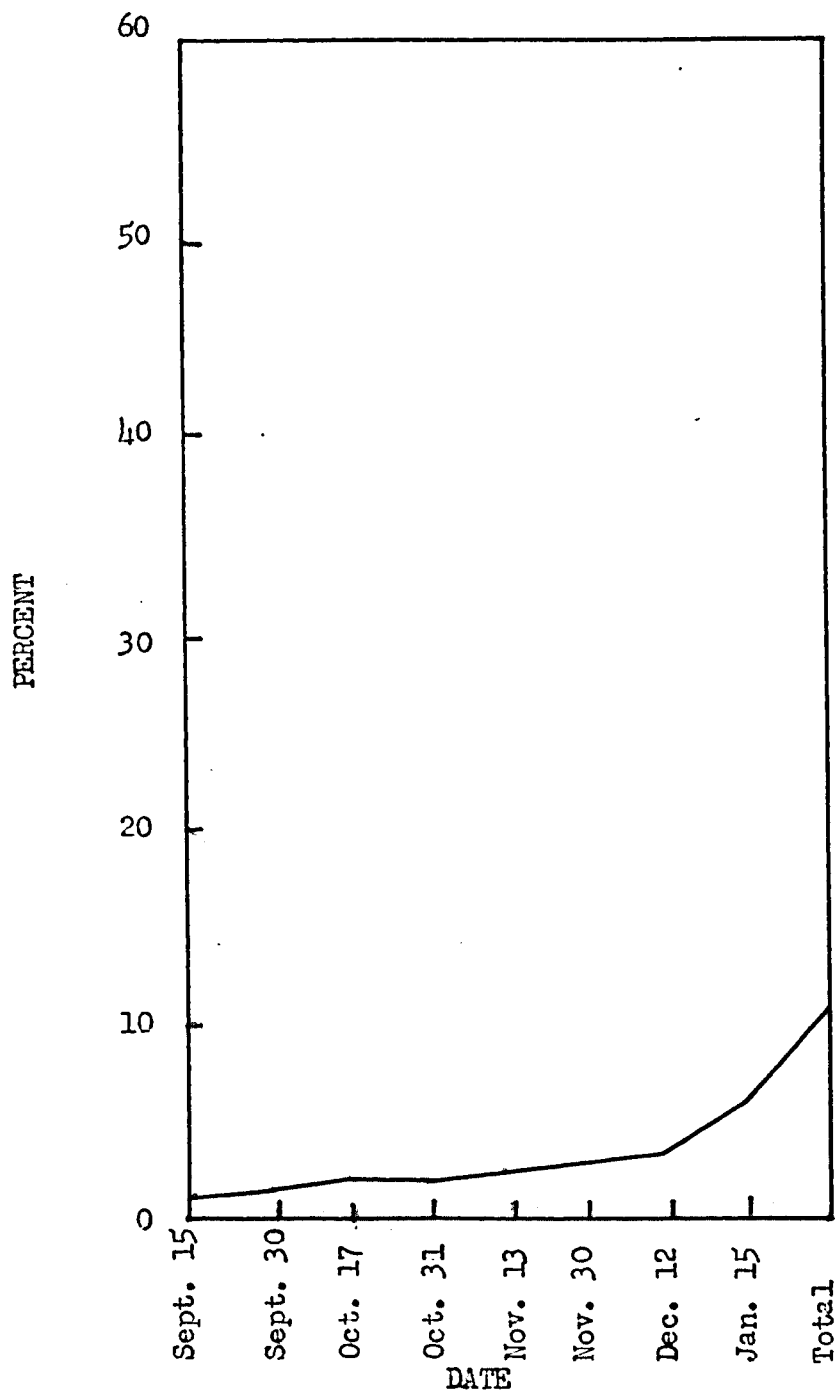
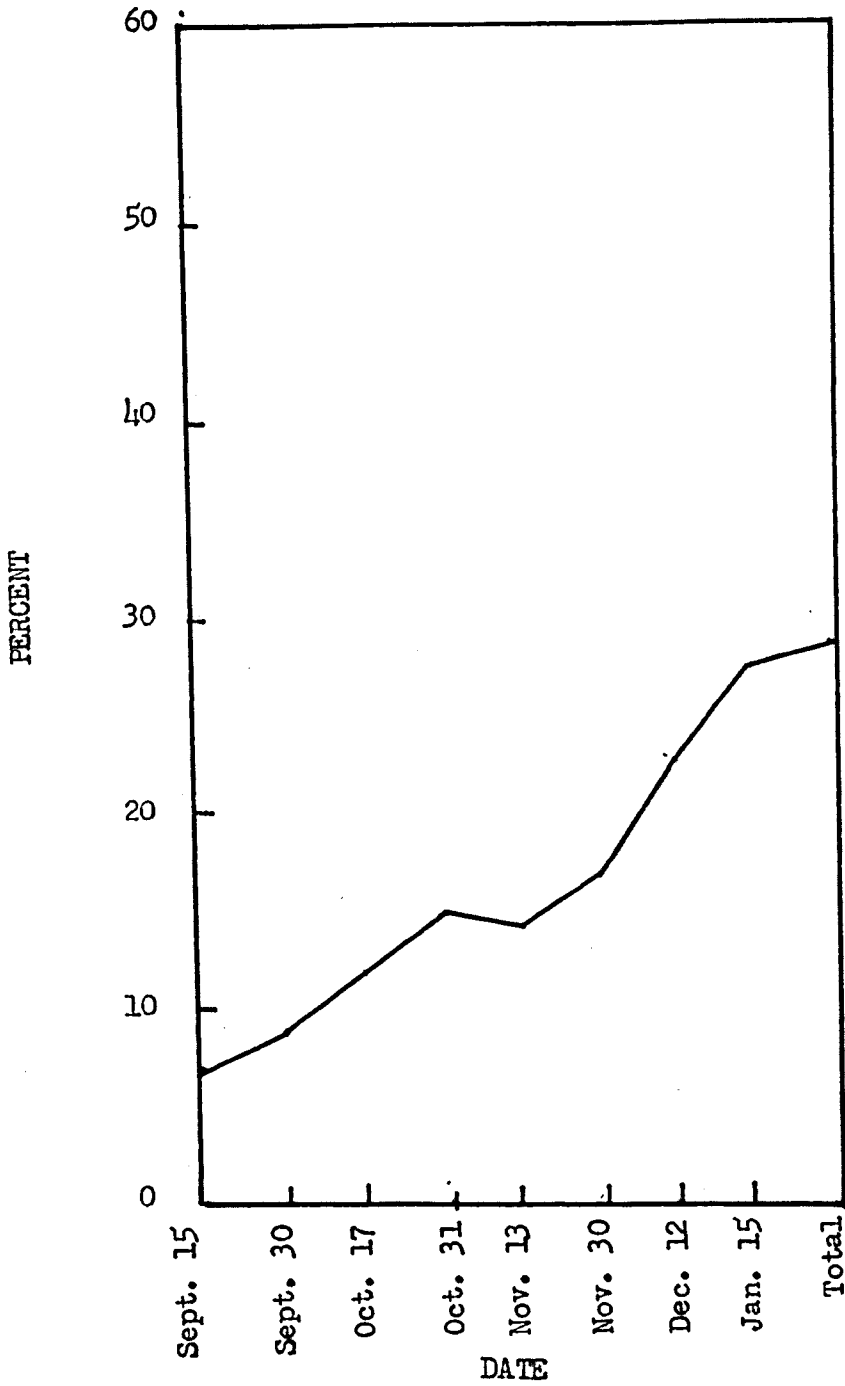


FIGURE VI
ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON
GRADING SPOT THROUGH SPECIFIED DATES,
ARIZONA, 1943-1951. 10/



10/ Ibid. Page 10.

the period 1943-1951. The proportion at the beginning of the crop year was almost negligible. However, by the end of the season, this proportion had shown an abrupt and sizeable increase. The increase of this grade can be attributed to: (1) The influences by weather, (2) the mixing of trash and staining of cotton by mechanization and (3) rough harvesting practices toward the end of the season. Naturally, when this classification becomes evident the value of the cotton decreases rapidly.

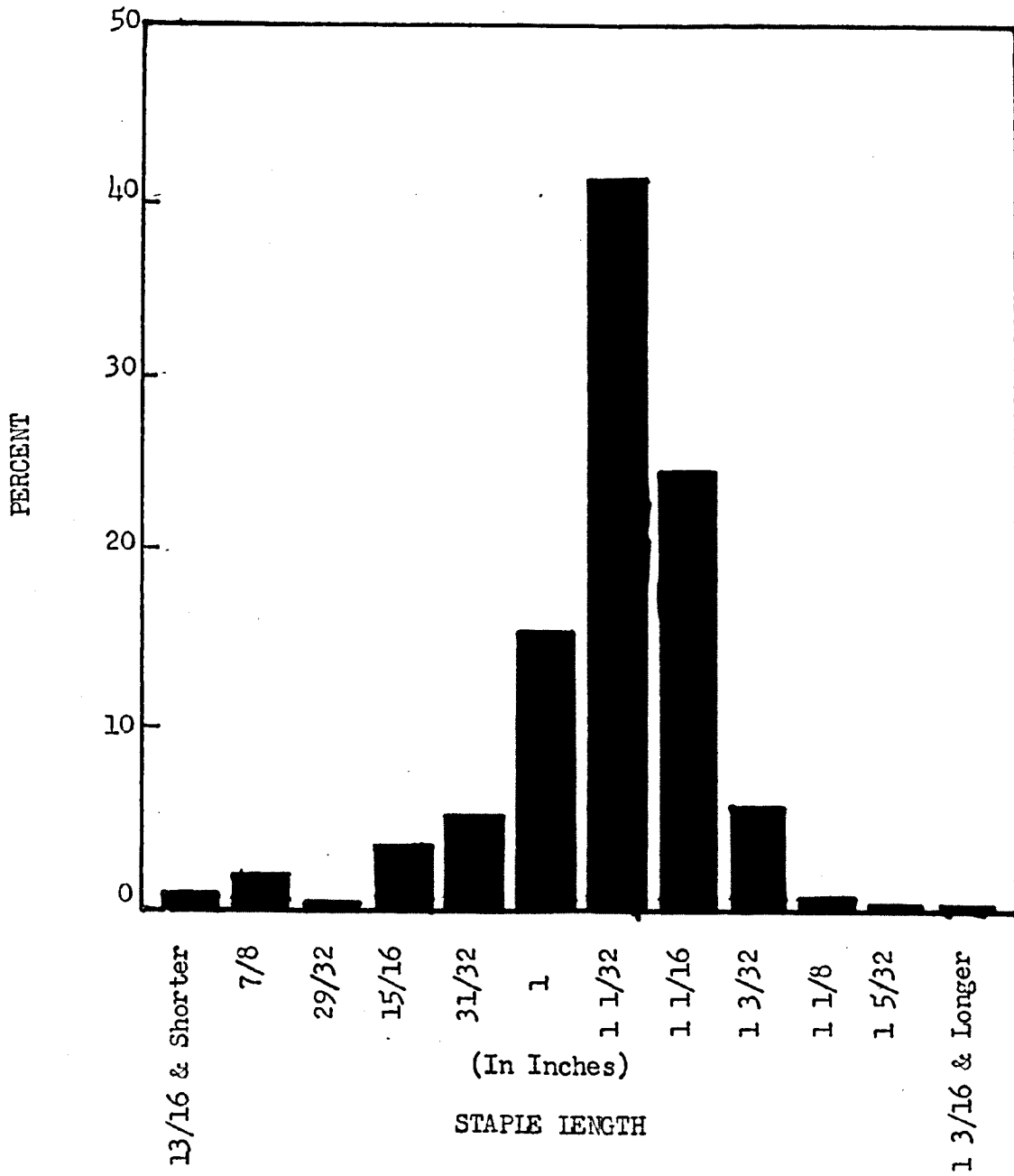
Staple Length: Figure VII indicates the average distribution in staple lengths of Arizona Upland cotton for the period 1943 through 1951. This graphic presentation indicates a strong central tendency. This situation is shown by the very low percentage in the shorter lengths, with a very steep incline in the 1-1/32 inch staple length of cotton, and a very sharp decline to a very low percentage of the longer staple cotton. This chart proves that the staple length, 1-1/32 inch is the mean, median and modal classification for Arizona cotton.

Figure VIII indicates the average seasonal movement in the proportion of the Arizona Upland cotton crop which is 31/32 inch staple for the period 1943 through 1951. The graph indicates that the percentages of this staple length were constantly low for the entire season. Three and seven tenths is the average percentage for the nine-year period that was studied.

Figure IX indicates the average seasonal movement in the proportion of the Arizona Upland cotton crop which is 1 inch staple for the period 1943 through 1951. Figure IX indicates that the lowest percentage of this grade was evident at the beginning of the harvesting season, September 15. From this date forward, to the end of the crop year, the percentage line forms a U shape, with a slightly higher percentage at the end of the year.

Figure X indicates the average seasonal movement in the proportion of

FIGURE VII
 AVERAGE DISTRIBUTION IN STAPLE LENGTH OF UPLAND
 COTTON GINNED IN ARIZONA, 1943-1951. 11/



11/ Ibid. Page 10.

FIGURE VIII

ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON
31/32 INCH STAPLE LENGTH THROUGH SPECIFIED DATES,
ARIZONA, 1943-1951. 12/

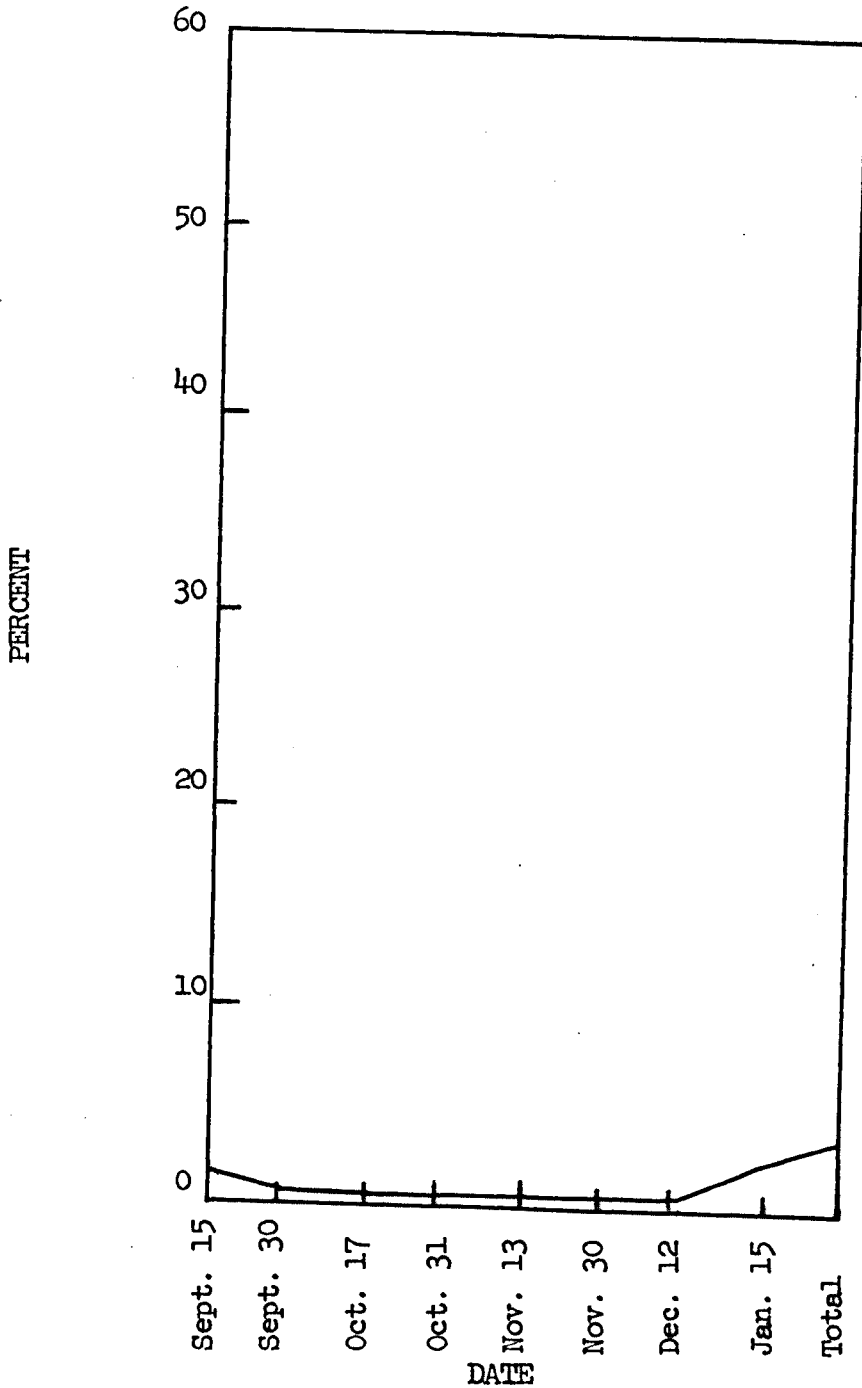


FIGURE IX

ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON
1 INCH STAPLE LENGTH THROUGH SPECIFIED DATES,
ARIZONA, 1943-1951. 13/

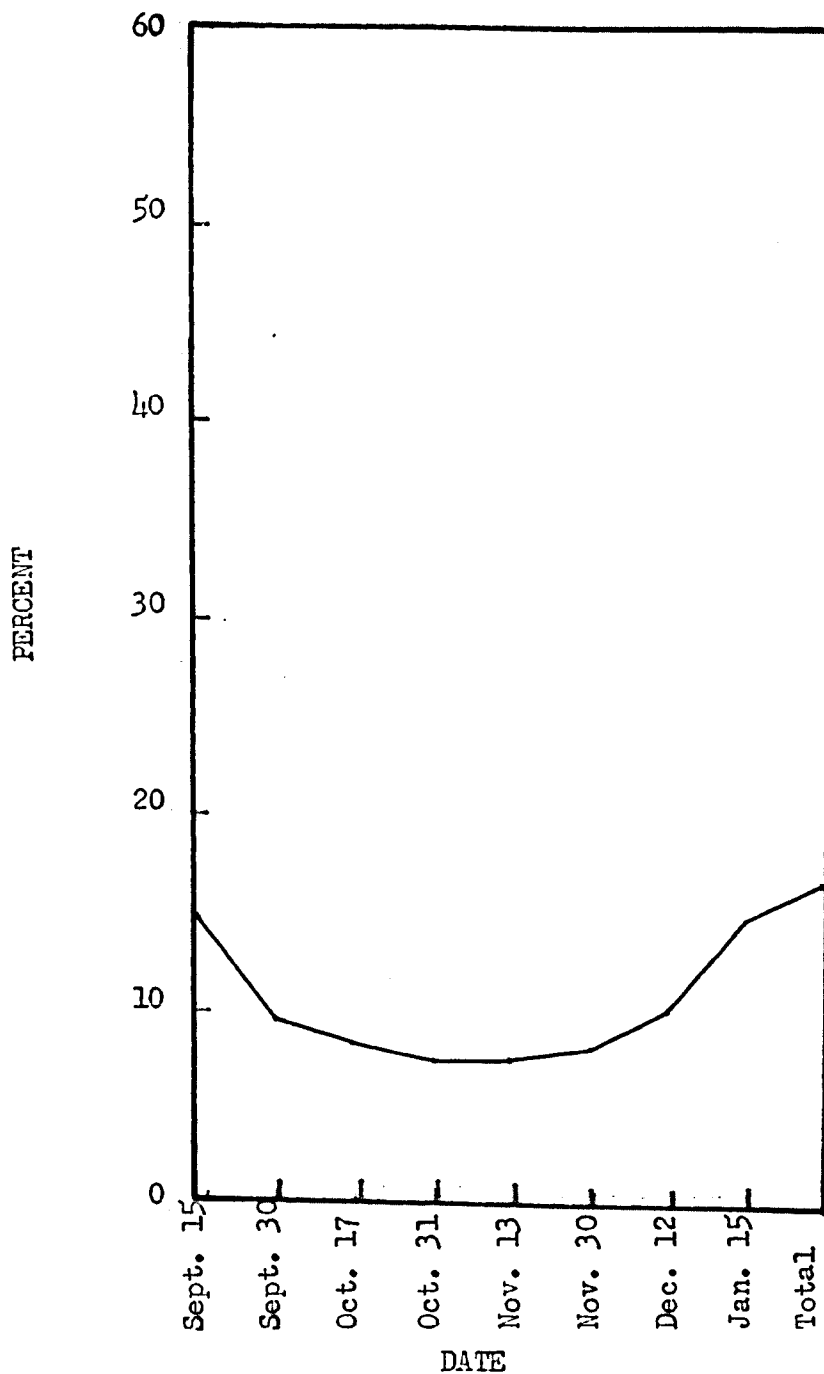
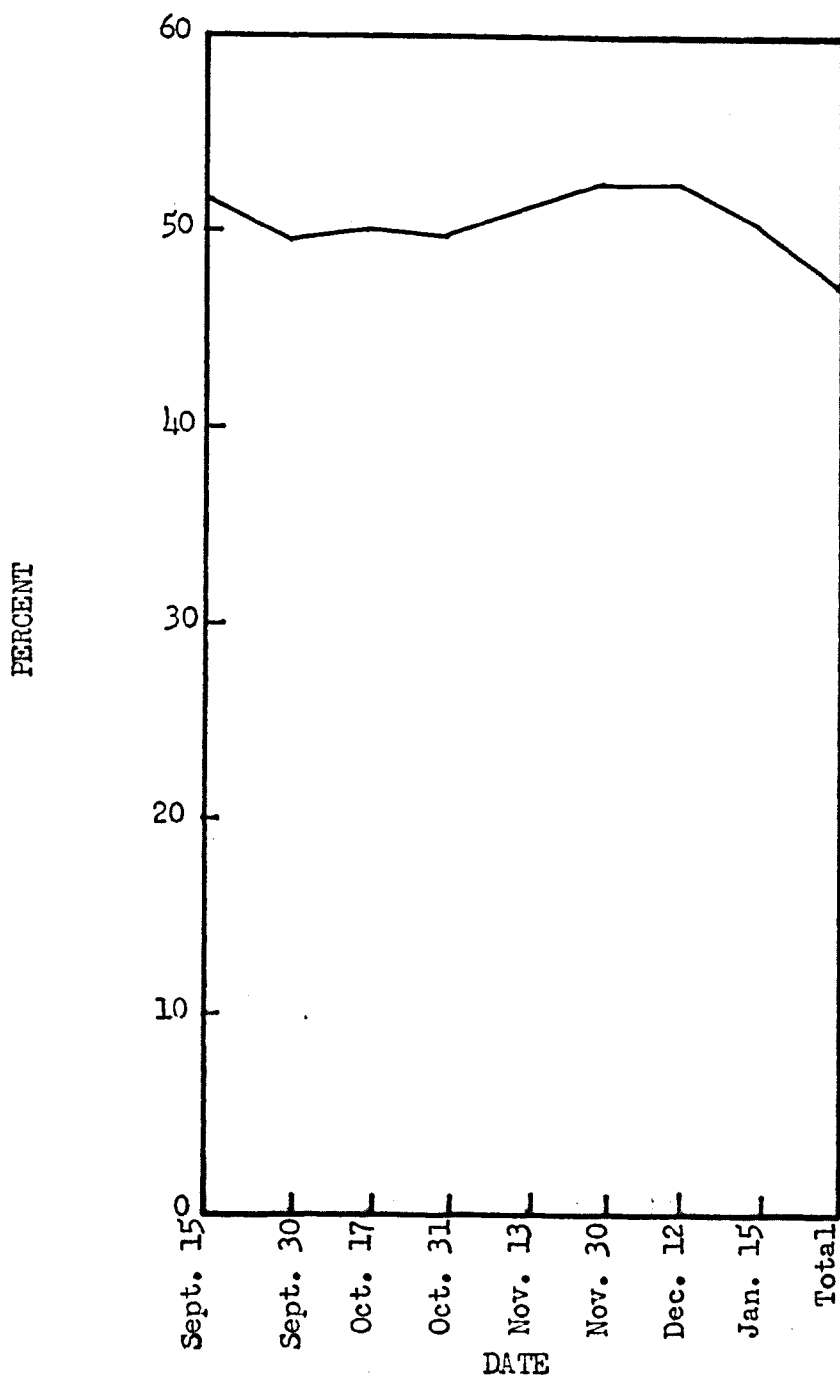


FIGURE X

ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON
1 1/32 INCH STAPLE LENGTH THROUGH SPECIFIED DATES,
ARIZONA, 1943-1951. 11/₁



the Arizona Upland cotton crop which is $1-1/32$ inch staple length for the period 1943 through 1951. The percentage line for this grade remains almost constant throughout the entire year. However, at the end of the season a slight increase is evident.

Figure XI indicates the average seasonal movement in the proportion of the Arizona Upland cotton crop which is $1-1/16$ inch staple for the period 1943 through 1951. The percentage ginnings for this particular staple length constitute an inverted U, rising until October 31 and declining thereafter until the end of the season.

Figure XII indicates the average seasonal movement in the proportion of the Arizona Upland cotton crop which is $1-3/32$ inch staple for the period 1943 through 1951. There was a slight increase at the beginning of the crop year from September 15 to September 30. From this point forward, the percentage line decreases to October 17 where an almost straight line was evident for the remainder of the season.

Figure XIII indicates the seasonal average grade indices for Arizona cotton for the years 1943 through 1951. The beginning of the graph indicates a Middling plus grade. From this point to the end of the season there was a steady decrease to a Strict Low Middling grade.

Utilization of Percentage Figures: Often in the past, buyers and sellers of Arizona cotton have expressed a desire to be furnished estimated figures for both grade and staple length of Arizona cotton for both certain specified dates and total crops. It is possible to use the figures in Tables V, VI, and VII to furnish this information to anyone desiring these estimates. Table V gives the nine-year average grade distribution for cotton ginned prior to specified dates, Table VI gives the nine-year average distribution in the staple lengths of cotton ginned

FIGURE XI

ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON
 1 1/16 INCH STAPLE LENGTH THROUGH SPECIFIED DATES,
 ARIZONA, 1943-1951. 15/

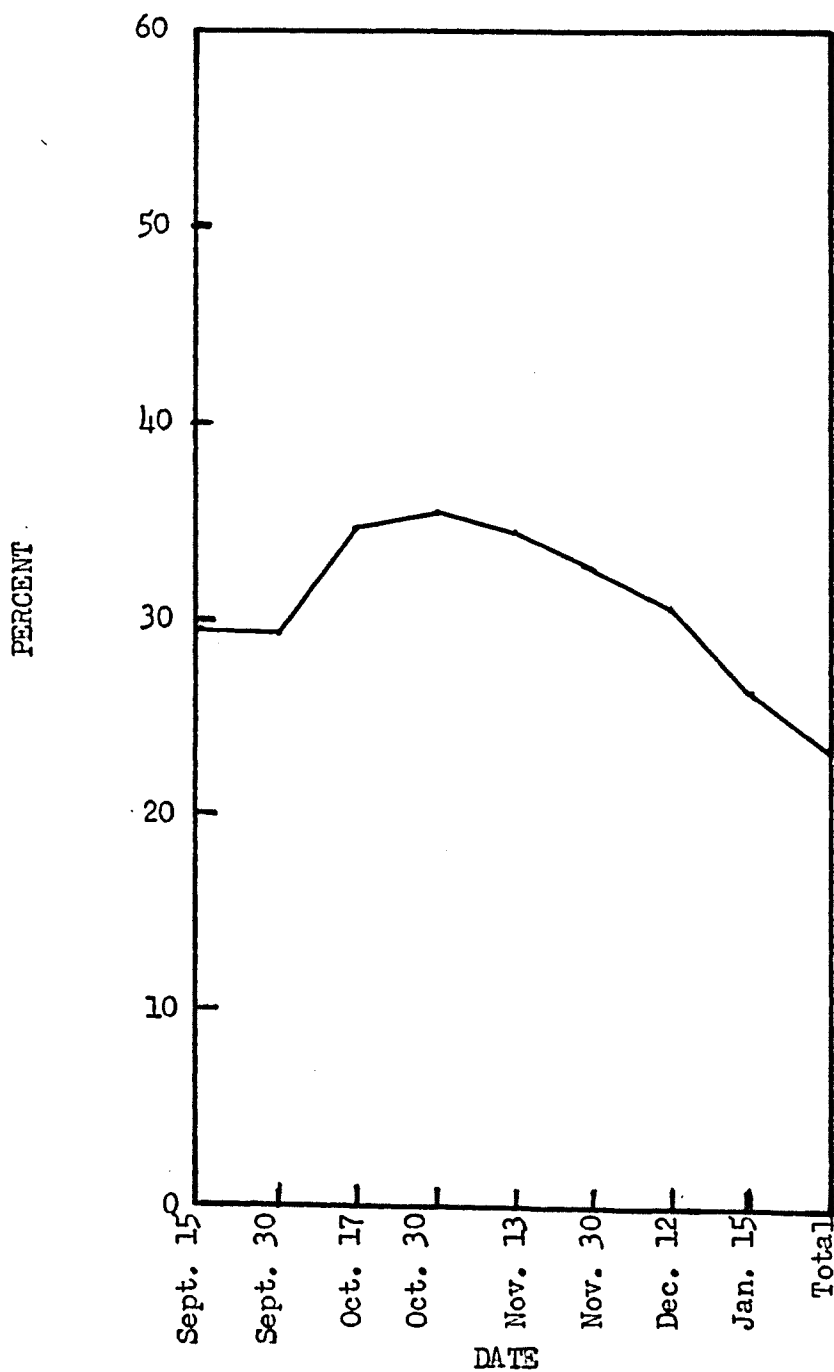


FIGURE XII

ACCUMULATIVE PERCENTAGE OF AMERICAN UPLAND COTTON
 1 3/32 INCH STAPLE LENGTH THROUGH SPECIFIED DATES,
 ARIZONA, 1943-1951. 16/

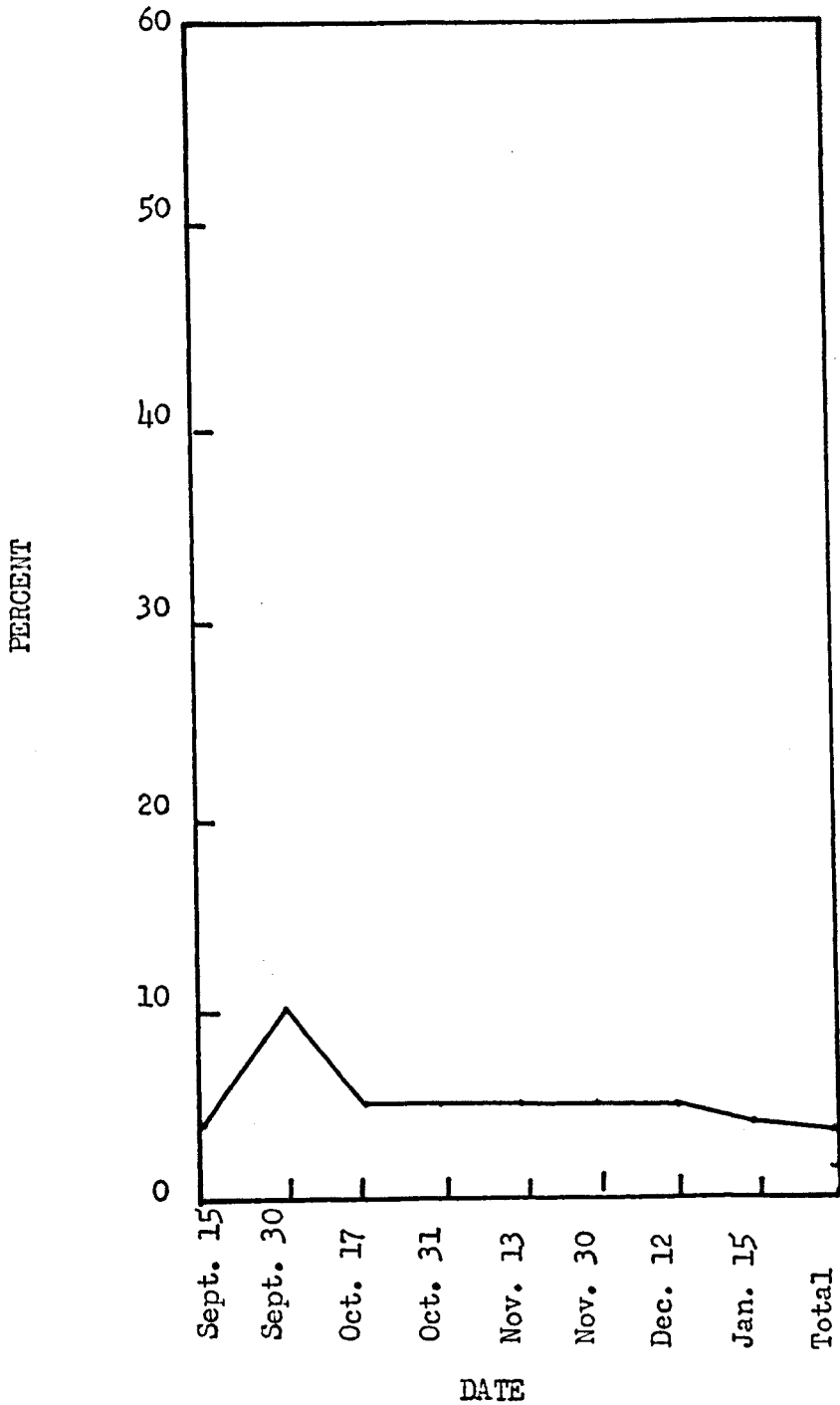


FIGURE XIII
GRADE INDEX OF ARIZONA UPLAND COTTON THROUGH
SPECIFIED DATES, ARIZONA,
1943-1951. 17/

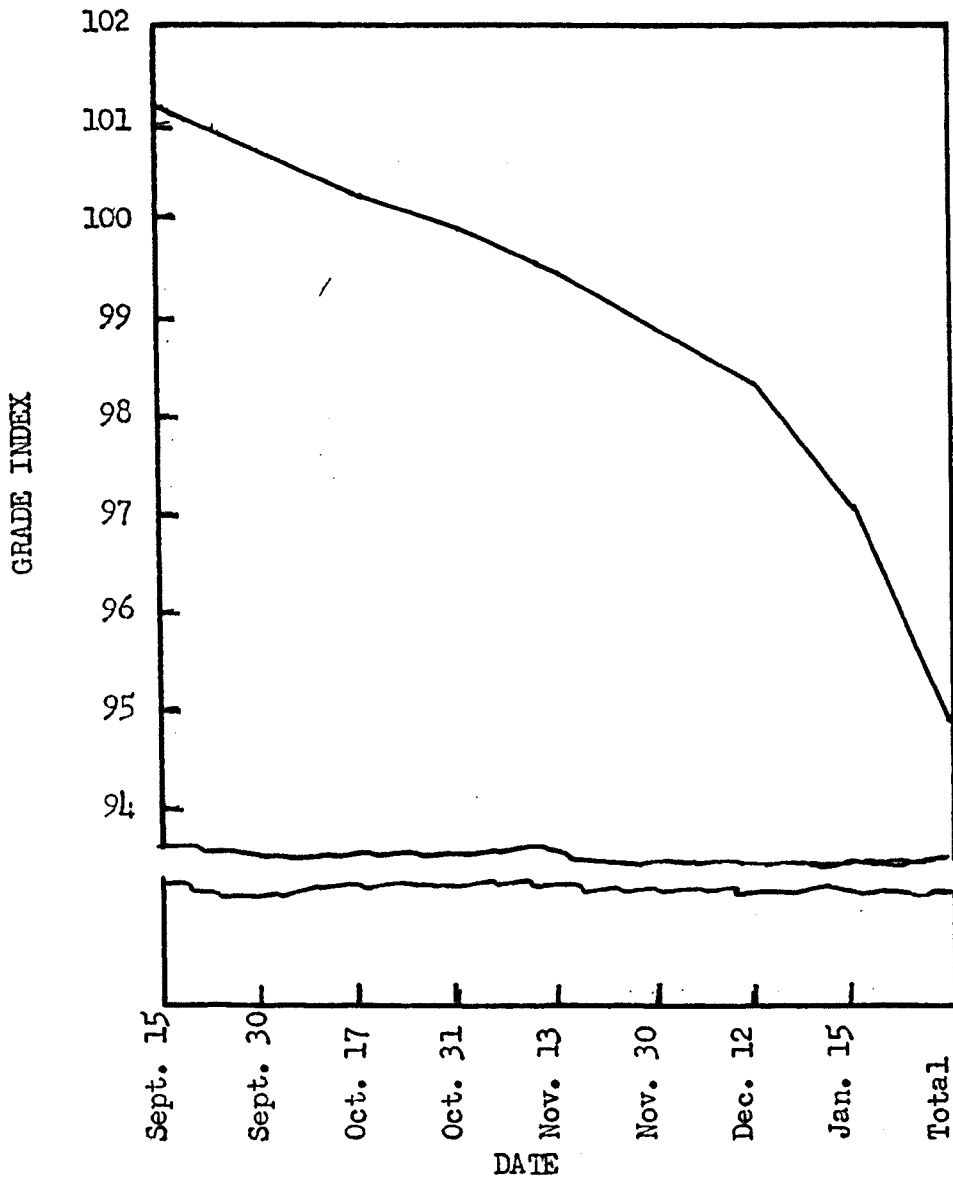


TABLE V

GRADE DISTRIBUTION OF UPLAND COTTON GINNED PRIOR TO
SPECIFIED DATES, ARIZONA, AVERAGE OF CROP YEARS, 1928-1951. 18/

<u>Date</u>	<u>GM & Above</u>	<u>SM</u>	<u>M</u>	<u>SIM</u>	<u>LM & Below</u>	<u>Spot</u>	<u>Tinge</u>	<u>Gray</u>	<u>Below Grade</u>
Sept. 15	1.38	38.96	46.07	5.70	1.00	6.94			
Sept. 30	1.27	36.41	43.97	7.84	1.56	8.77			
Oct. 17	.98	33.08	42.83	9.90	1.99	11.70			
Oct. 31	.81	28.14	42.93	11.44	1.96	14.64			
Nov. 13	.61	23.12	46.00	14.14	2.26	14.01			
Nov. 30	.50	19.80	40.32	15.78	2.66	16.59		.03	
Dec. 12	.44	17.22	37.46	17.21	3.36	22.54	.01	.20	
Jan. 15	.33	13.44	30.69	18.72	6.01	27.48	.43	.43	.04
TOTAL	.27	12.01	27.65	17.88	10.54	28.17	1.03	1.90	.90

18/ Ibid. Page 10.

TABLE VI

DISTRIBUTION IN STAPLE LENGTH OF UPLAND COTTON GINNED PRIOR TO SPECIFIED DATES, ARIZONA AVERAGE OF CROP YEARS 1943-1951.^{19/}

<u>Dates</u>	<u>13/16 & Shorter</u>	<u>7/8</u>	<u>29/32</u>	<u>15/16</u>	<u>31/32</u>	<u>1</u>	<u>1 1/32</u>	<u>1 1/16</u>	<u>1 3/32</u>	<u>1 1/8</u>	<u>1 5/32</u>	<u>1 3/16 & Longer</u>
Sept. 15					1.7	14.3	51.8	29.3	2.6			.1
Sept. 30					.7	9.0	49.8	29.1	9.5	.8	.1	.8
Oct. 17					.6	8.0	50.0	34.7	4.3	1.8	.1	.1
Oct. 31					.5	7.0	50.0	35.4	4.5	1.1	.2	1.1
Nov. 13					.5	6.9	51.0	34.4	4.6	1.1	.2	1.1
Nov. 30					.5	7.7	52.5	32.4	4.5	1.0	.2	1.0
Dec. 12				.1	.7	9.7	52.3	30.6	4.3	1.0	.2	1.0
Jan. 15		.3		1.2	2.3	14.2	50.3	26.1	3.6	.8	.2	.8
TOTAL	.5	1.4		2.9	3.7	16.0	47.4	23.2	3.2	.7	.2	.7

^{19/} Ibid. Page 10.

prior to specified dates, and Table VII gives a nine-year average of ginnings of Arizona cotton prior to specified dates.

To obtain estimated figures for any one of the bi-weekly dates on total ginnings of any one of the various grades, through that date, the following procedure must be followed: First, the average percent of ginnings through the selected date must be multiplied times the Arizona Upland cotton crop estimate for the year concerned; Second, this figure that is obtained, the estimated number of bales for the particular date, must be multiplied by the percentage of the grade concerned for the same date. By following this procedure, it is possible to obtain a purely estimated figure for both the number of bales ginned and the number of bales for one of the grades for the particular date that the figure was used. A hypothetical example of the above-outlined procedure, using these figures, is as follows: The estimated total number of bales of Arizona cotton produced is 1,000,000. The averages for the date October 17 will be used (percentage ginnings for this date is 22.5 percent and the percentage figures for the Middling grade is 42.83).

The total estimate of 1,000,000 bales is multiplied by 22.5 percent, the average percentage ginnings for October 17. This gives an estimated ginning figure of 225,000 bales of cotton. This figure, 225,000, is multiplied by 42.83 percent which is the average percentage figure for the Middling grade of cotton. A final figure of 94,748 bales of cotton is obtained. This is the estimated number of bales of Arizona Middling cotton that could be expected on October 17 for this hypothetical year.

The same procedure is followed in computing the estimated figures for any particular staple length. The following is an example of expected staple lengths for a hypothetical year (1,000,000 bales of cotton

TABLE VII

GINNINGS OF ARIZONA UPLAND COTTON PRIOR TO SPECIFIED DATES^{20/} ^{21/}

	<u>Sept. 15</u>	<u>Sept. 30</u>	<u>Oct. 17</u>	<u>Oct. 31</u>	<u>Nov. 13</u>	<u>Nov. 30</u>	<u>Dec. 12</u>	<u>Jan. 15</u>	<u>TOTAL</u>
1951	2.8	7.0	14.9	23.5	33.2	49.6	58.1	80.8	100
1950	6.7	16.7	31.2	44.7	56.0	71.9	81.0	96.0	100
1949	5.6	12.5	23.5	34.3	46.0	63.3	73.4	93.9	100
1948	6.1	14.5	26.1	36.3	47.8	64.4	74.1	92.2	100
1947	8.4	15.7	24.4	36.1	46.3	57.3	65.1	91.4	100
1946	7.3	12.4	23.3	33.5	44.1	59.0	70.6	90.1	100
1945	4.0	10.8	19.2	30.0	38.3	55.2	65.6	84.4	100
1944	2.0	8.0	16.5	25.9	34.5	43.2	53.2	78.7	100
1943	7.9	13.7	23.1	30.7	40.9	53.9	61.0	77.0	100
AVERAGE	5.6	12.4	22.5	32.8	43.0	57.5	66.9	87.2	100

^{20/} Ibid. Page 10.^{21/} Cotton Production and Distribution, Season of 1947-48, Page 16, and Season of 1943-44, Page 8, Department of Commerce, Bureau of the Census.

will be used once again for total crop and the 1-1/32 inch staple length cotton classification figures will be used). The figure 1,000,000 bales is multiplied by 100 percent (this is the total crop therefore the percentage figure would be 100 percent) and the figure of 1,000,000 bales remains. This figure is multiplied by 47.4 percent and 474,000 bales of 1-1/32 inch Middling Arizona Upland Cotton could be expected for this hypothetical year.

As was previously stated, these figures are only estimates and this fact should be remembered if figures computed in this manner are to be used.

CHAPTER II

THE GOVERNMENT COTTON CLASSING SYSTEM

A complete study of the relation of Arizona cotton prices on the Phoenix market to quality of cotton cannot be accomplished without a study of the cotton classification system. That is the purpose of this portion of the study. It was accomplished by examining the various bulletins available from various sources and extracting those portions that are of particular interest to the buyers and sellers of Arizona cotton. This, in turn, will be passed on to the readers of this study.

The first thing to examine in any study of cotton classing is the principal elements which affect quality. These factors are grade, staple length and character. Each of these factors will be considered individually in the following paragraphs.

Grade is composed of three factors: color, leaf or foreign matter, and ginning preparation. Color may be described in terms of three attributes; hue or the name of the color, brilliance as the lightness or darkness of color, and chroma which is the intensity, strength, or degree of color. Foreign matter refers to the parts of the cotton plant such as leaves, stems, or burrs which in some manner pass through the complete ginning process and are retained in the ginned lint. This term does not apply to any other matter, such as iron, steel, stone or other objects, packed in "false bales." Preparation is the degree to which the normal length of fiber is maintained or the regularity with which the individual fibers are laid together in ginning and the relative neppiness of the cotton. Foreign matter is more readily found in the lower grades than in the higher grades. The various grades of cotton may be found in

Table VIII.

TABLE VIII

UNIVERSAL STANDARDS FOR GRADE OF AMERICAN UPLAND COTTON

<u>GRAY</u>	<u>EXTRA WHITE</u>	<u>WHITE</u>	<u>SPOTTED</u>	<u>TINGED</u>	<u>YELLOW STAINED</u>
		*MF			
		SCM			
*GMG	*GMEW	GM	*GMSp	GMT	*GMYS
*SMG	*SMEW	SM	*SMSp	SMT	*SMYS
*MG	*MEW	M	*MSp	MT	*MYS
	*SLMEW	SLM	*SLMSp	SLMT	
	*LMEW	LM	*LMSp	LMT	
	*SGOEW	SGO			
	*GOEW	GO			

* Descriptive Standards

The letters which are used mean as follows: G can denote either good or gray (the difference in use can be noted in that the term gray is always found under the columnar heading gray), M denotes middling, E denotes extra, W denotes white, O denotes ordinary, Sp denotes spotted, T denotes tinged and YS denotes yellow stained.

The grade Middling Fair embraces White cotton which in color, leaf, and preparation is better than Strict Good Middling.

The grade Good Middling Gray, Strict Middling Gray, and Middling Gray apply to cotton which in leaf and preparation is of these three grades, but which is more gray in color than the corresponding grades for White cotton.

The grades Good Middling Spotted, Strict Middling Spotted, Middling Spotted, Strict Low Middling Spotted, and Low Middling Spotted apply to cotton which in leaf and preparation is of these five grades, but which

in color is between the corresponding grades for White and Tinged cottons.

The grades Good Middling Yellow Stained, Strict Middling Yellow Stained and Middling Yellow Stained apply to cotton which in leaf and preparation is of these three grades, but which is more yellow in color than the corresponding grades for Tinged cotton.

Since July 1940, only the grades shown above the horizontal line in the foregoing table have been deliverable on the cotton futures contracts of the New York and New Orleans Cotton Exchanges, and the Chicago Board of Trade. No cotton of any grade is deliverable on futures contracts unless it is at least $7/8$ of an inch in staple length, and cotton is not deliverable on the new futures contract if for any reason it has been reduced in grade or staple, or, in the case of non-rain-grown cotton, unless it is at least Middling (White) or Middling Extra White in grade and at least $1\ 1/32$ inches in staple length. ^{22/} This was changed in 1952 to include one additional grade of irrigated cotton, namely, Strict Low Middling White and Extra White $1\ 1/16$ inch and longer.

The standards as listed in Table VIII will be superseded by revised standards which eliminate the classification, "extra white". These were merely transferred to "white" with no designation between "white and extra white" being made. The grades of Middling Fair and Strict Good Middling were eliminated. ^{23/}

^{22/} Agriculture Handbook for Cotton Classers, United States Department of Agriculture, Washington, D. C., September, 1940. P. 6.

^{23/} Official Cotton Standards of the United States for the Grade of American Upland Cotton, Effective August 15, 1953. (Reprint from the Federal Register of August 15, 1952.)

Staple length of cotton is the length by measurement of a typical sample of its fiber. The linear designation varies from below three-fourths of an inch up to one and three-fourths inches by one and one-thirty-second inch variation. For the purposes of this study, the staple lengths are classified as thirteen-sixteenths inches and longer by one-thirty-second of an inch variation. Reference is made to Appendix II.

Character can be defined as those properties of cotton which are not included in grade or staple length. Character can also be described as "better than", "equal to", or "below" the character of the official staple length types or in terms of special types or samples or by any other means acceptable to the parties concerned. In classifying a sample of inferior character, the sample is given the proper grade designation, but the staple classification should be reduced to that which corresponds most nearly to the value of the cotton. The length from which reduced and to which reduced and the reason for the reduction is always stated on the cotton tag.

A study of the cotton classing system would not be complete without a brief treatment of method of sampling and the grading of the samples. An actual sample is composed of approximately six ounces of cotton and approximately three ounces should be drawn from either side of the bale. These samples collected from the various bales are stored in the normal atmosphere for several hours before the classing is done. (Normally, these samples are left standing overnight and then the classing is done.) If the sample is either too dry or too moist, an accurate sample cannot be obtained. Moisture content is also applicable to the staple type to which the sample is compared. After

the sample has been exposed to the atmosphere, the grading of the sample is begun. A portion of the sample is compared to a grade type to determine the actual grade. Then careful consideration is given to any other color factors such as tinge, spot, gray, etc. After all of these factors have been taken into consideration, a specific grade is assigned to the sample. Another portion of the sample is "pulled" and compared to a staple type and a specific staple length is assigned to the sample.

There are two factors that are very important in classifying cotton. These factors are (1) letting the cotton remain in a normal atmosphere for several hours (the importance was stressed in the preceding paragraph) and (2) light. Without proper and sufficient light, cotton classing could not go on. Classing should be done under a skylight or a north window and no crosslights. Classers nearly always work with the light coming over their left shoulders. All of the windows in the building, except the skylights northern windows, are painted, screened, or blocked in some other manner to prevent light infiltration.

Often there are samples that do not meet the requirements for the normal sample and when these samples are classified, special terms must be used. A few of these terms and their definitions are as follows: (1) Cotton of perished staple - the strength of fiber has been destroyed or reduced through exposure to the weather either before picking or after baling, or through heating by fires, or on account of water packing, or by other causes. (2) Cotton of immature staple - cotton that has been picked and baled before the fiber has reached a normal state of maturity, resulting in a weakened staple of inferior value. (3) Gin-cut cotton - cotton that shows damage in

ginning, through "cutting" by the saws, to an extent that reduced its value more than two grades. (4) Reginned cotton - cotton that has passed through the ginning process more than once. (5) Repacked cotton - cotton that has been packed from various samples or from two or more bales of cotton. (6) False-packed cotton - cotton that contains substances entirely foreign to the cotton, interior damage without any exterior indications, or containing pickers or linters worked into the cotton. (7) Mixed-packed cotton - cotton in a bale that indicates differences of two or more grades, of the same grade but of different color variations, or shows variations of staple length of three thirty-seconds of an inch or more. (8) Water-packed cotton - cotton that has damage to the fiber either by exposure to weather conditions or penetration by water while in the baling process. (9) Sandy and dusty cotton - cotton that has sand or dust mixed with it. Classification depends upon amount present. (10) Oil-stained cotton - cotton that has become saturated with oil. (11) Seedy cotton - cotton that has a number of whole and parts of seed mixed with the lint. (12) Gin-fall - an accumulation of leaf and other foreign matter that dropped into the lint during the ginning process. 24/

A final portion of the study of the cotton classing system must be devoted to laboratory fiber analysis. Fiber analysis does not completely do away with cotton classing, nor does cotton classing do away with fiber analysis in the laboratory. Either of these two methods of measuring cotton quality can depend on the other and these two methods together are much more useful than either method by itself.

24/ Handbook for Cotton Classers, United States Department of Agriculture, September, 1940.

Four properties of fiber are most commonly measured in laboratory fiber analysis. These factors are fineness, strength, length, and maturity. ^{25/} Each of these will be discussed in the following paragraphs.

Fineness is usually reported as weight in micrograms per inch of fiber or as specific surface area. Fineness is a fiber property of great importance to the spinner and cotton product manufacturer. There are several instruments used for determining fineness of the cotton fiber but the most common one in use is called the Micronaire. This instrument gives readings as so much weight per inch.

Another factor of cotton fiber is strength. Strength is probably more important than any other factor of cotton fiber. Strength is determined by the use of the Pressley strength tester. Spinners of cotton products relate yarn, cord and fabric strengths to fiber strength.

Length is a third factor. Again, length is very important to the cotton spinner and therefore he is deeply concerned with the measurement of length. Length can be expressed in several ways, but the usual are: (1) Mean or average length, (2) upper half mean length, and (3) length uniformity or the uniformity ratio. ^{26/} Length is computed with the Hertil Fibrograph.

Maturity is the general term that is used now, although several years ago "immaturity" or "percentage of immature fibers" was used.

^{25/} Use and Application of Fiber and Spinning Test, National Cotton Council of America, Memphis, Tennessee.

^{26/} Ibid. Page 38.

A simple chemical test is used to determine maturity. This test is as follows: The cotton is soaked with caustic soda and the swollen or mercerized fibers are examined under a microscope. This test shows how big the lumen is and how thick the wall.

Each of these properties is very important to the manufacturer or spinner of a cotton product. Naturally, the spinner desires the best cotton for his business and the tendency is for the manufacturer to pay a higher premium for those properties that fit his needs.

CHAPTER III

THE RELATIONSHIP BETWEEN PHOENIX AND CENTRAL MARKET COTTON PRICES

Efficiency of the Phoenix Market in Reflecting Central Market Premium and Discounts for Quality

A correlation was made between prices received for Upland cotton on the Phoenix market and prices received for equivalent qualities of cotton on the Memphis market. The purpose of this correlation was to determine whether there was underpayment or overpayment prevailing in the Phoenix market based on equivalent prices in the Memphis market. It must be remembered that when the terms overpayment and underpayment are used, they are based on the hypothesis that the expected Phoenix price is the Memphis evaluation minus 105 points. This hypothesis is the same as the constant dollar margin line discussed in the following paragraph. The regression line (solid) and a constant dollar margin line (broken) were determined and a line for each factor was plotted on each chart. Around these lines, dots were plotted representing prices in the Phoenix market and equivalent prices in the Memphis market.

The formula for computing the line of regression was as follows:

$$Y = \frac{SXY - (SX \cdot \bar{Y})}{SX^2 - (SX \cdot \bar{X})}$$

Y is the Phoenix price and X is the Memphis price, and $a = \bar{Y} - b \cdot \bar{X}$. The constant dollar margin line was computed utilizing the 105 points difference as outlined in Table X. The 105 points was subtracted from an imaginary 1 to 1 ratio line. For example: on October 4, 1951 the 1 to 1 ratio line would run from the origin through the coordinates $Y = 37$, $X = 37$. To be absolutely correct, the constant dollar margin line

would be extended below the axis to the coordinates $Y = 31.95$, $X = 33.00$

Figures XIV, XV, XVI and XVII represent the first of the season. All of these charts indicate the same tendencies of overpayment on the Phoenix market compared to the constant dollar margin line. Many merchants had made commitments for Middling and Strict Middling cotton that they didn't own, but which they expected to buy to fulfill these commitments. However, late August rains in 1951 reduced cotton in grade and these qualities were not available in quantity. As a result these merchants bought a wide range of grades of cotton at prices higher than ordinary market conditions would justify in order to fulfill the contracts. The sole purpose of purchasing these grades and paying the overpayments was to avoid the penalties for defaulting on their contracts.

Figures XVIII, XIX and XX are approximately the same as the preceding correlation charts. However, overpayments are not as large. During this period cotton prices approached the ceiling of \$45.39 for futures cotton and buyers were speculating that cotton prices would continue to rise until the ceiling was reached. Of course, this resulted in overpayments for certain days, especially November 8, 1951.

Figures XXI, XXII, XXIII, XXIV, XXV, XXVI, and XXVII are normal market situations, in that, they are exactly as would have been expected. The line of regression and the constant dollar margin line are either equal or cross, resulting in some overpayments and some underpayments.

Figures XXVIII, XXIX and XXX indicate underpayments for Upland cotton on the Phoenix market. This underpayment is a result of

FIGURE XIV

CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON
ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS. 27/
OCTOBER 4, 1951

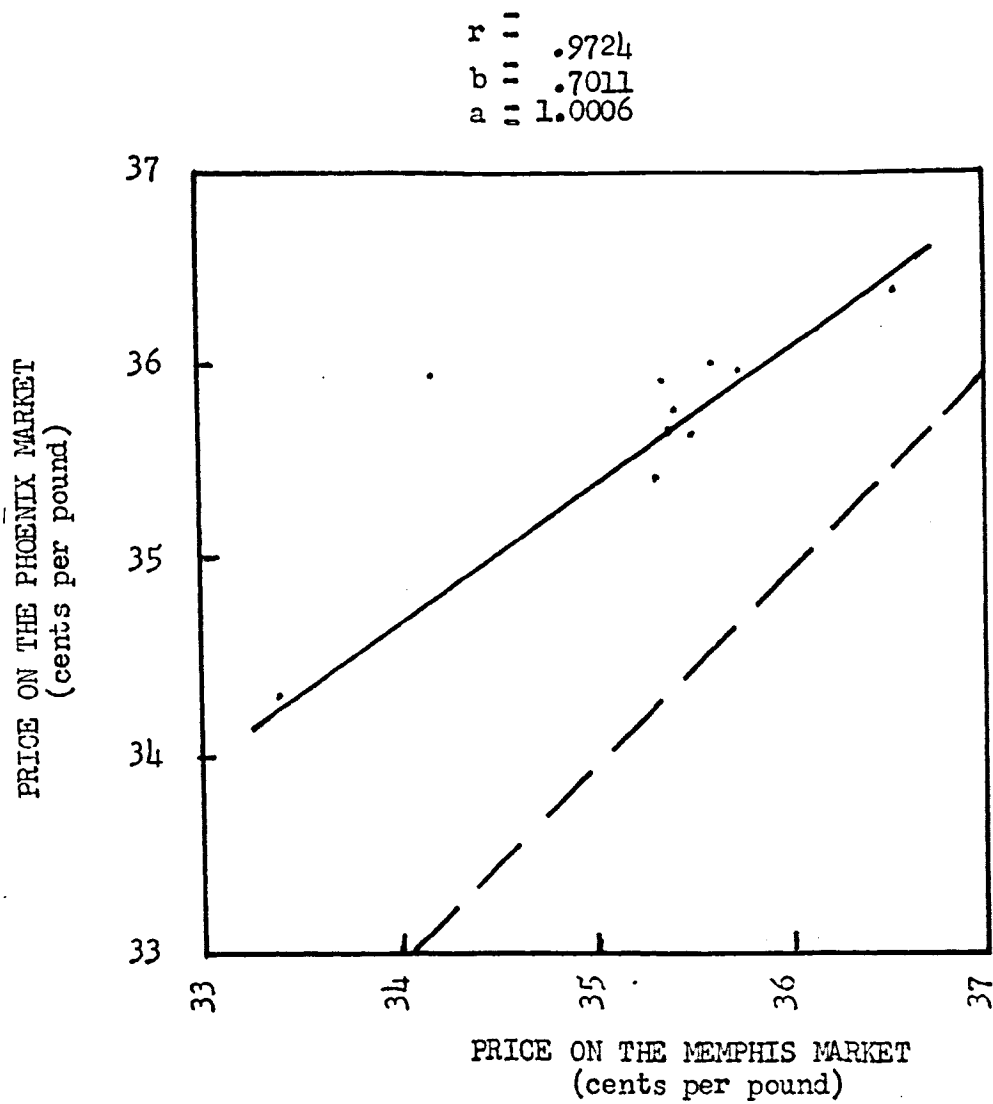


FIGURE XV

CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON
ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS. 28/
OCTOBER 18, 1951

r equals .9174
b equals .6964
a equals 1.8361

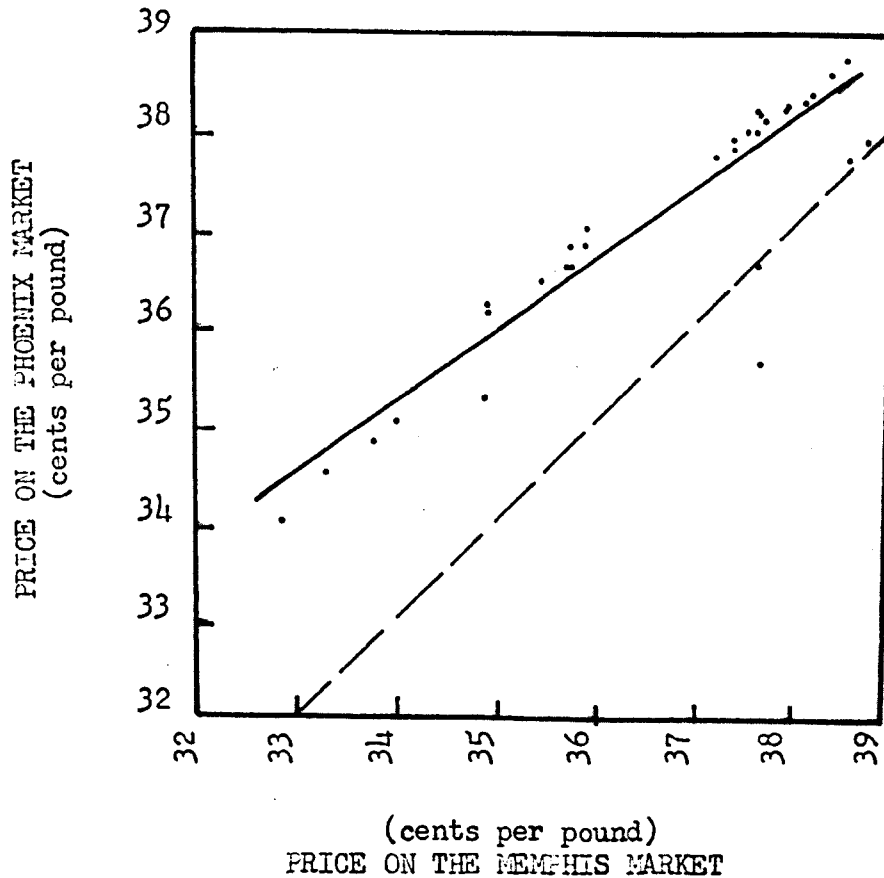


FIGURE XVI

CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON
ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS. 29/

OCTOBER 25, 1951

r equals .9514
b equals .6090
a equals 1.8597

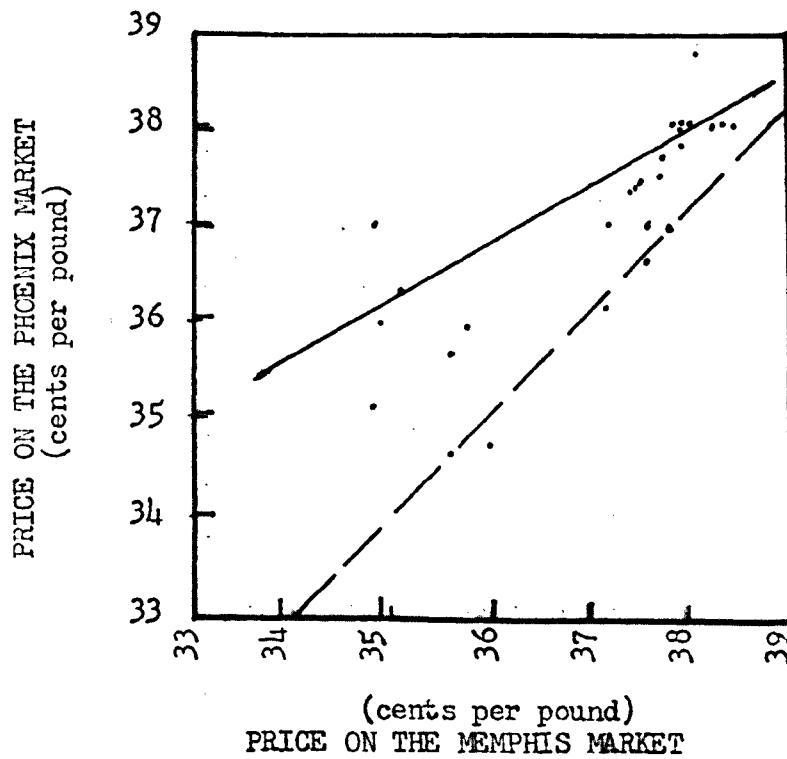
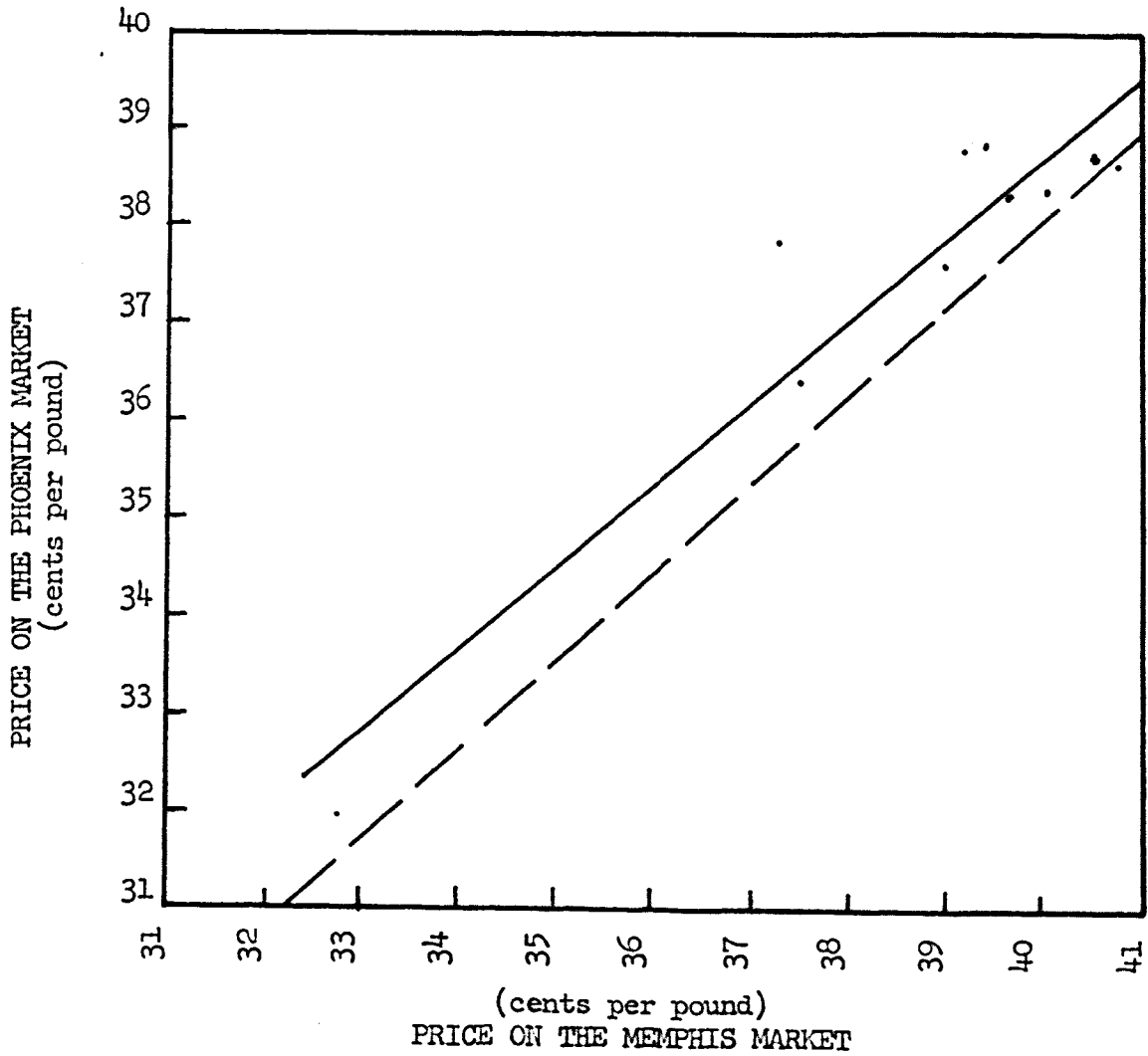


FIGURE XVII

CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON
ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS.^{30/}
NOVEMBER 1, 1951

r equals .9317
b equals .8431
a equals .2409

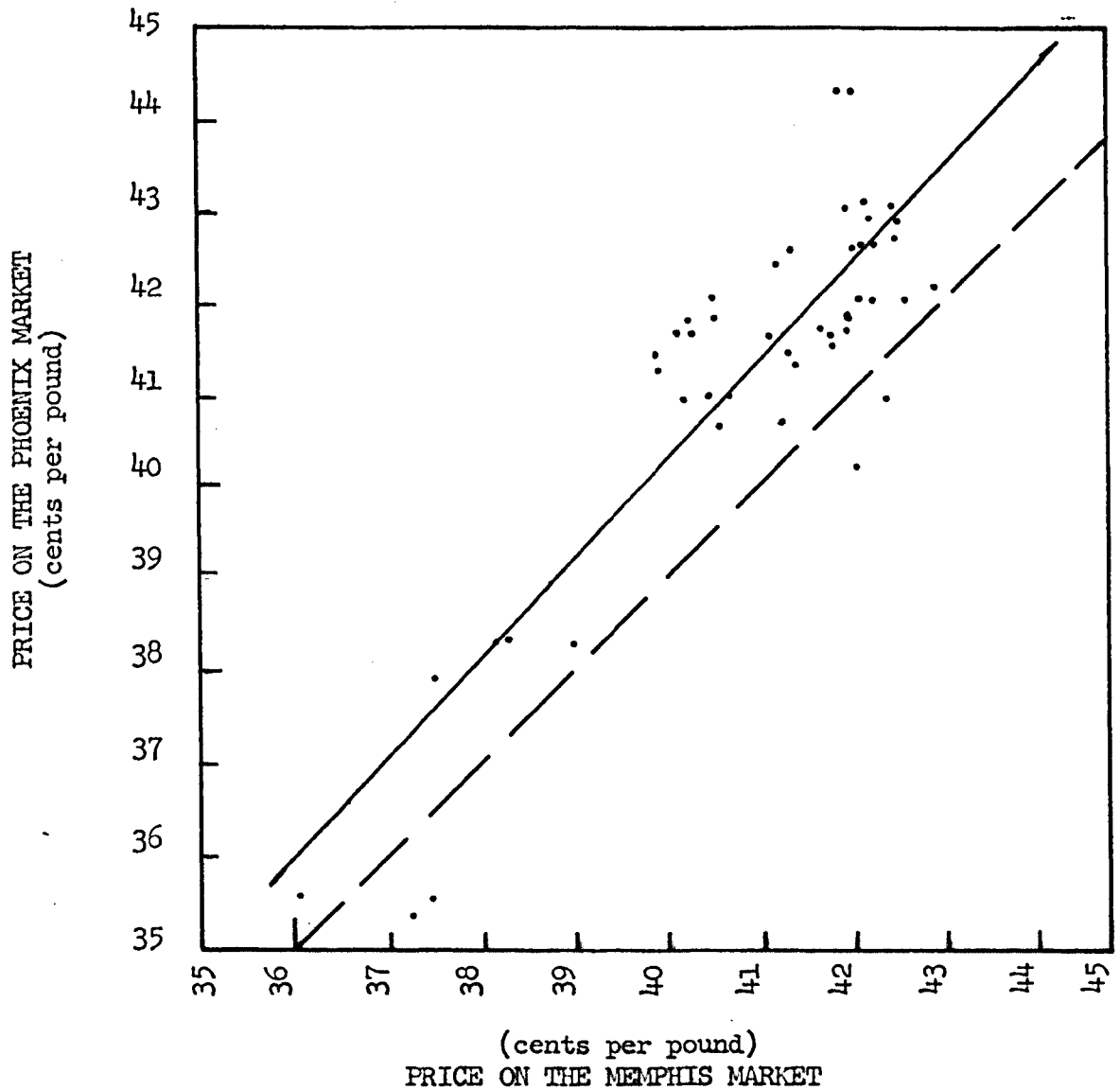


^{30/} Ibid. Page 42.

FIGURE XVIII

CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON
ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS.^{31/}
NOVEMBER 8, 1951

r equals .9344
b equals 1.0635
a equals -.0641

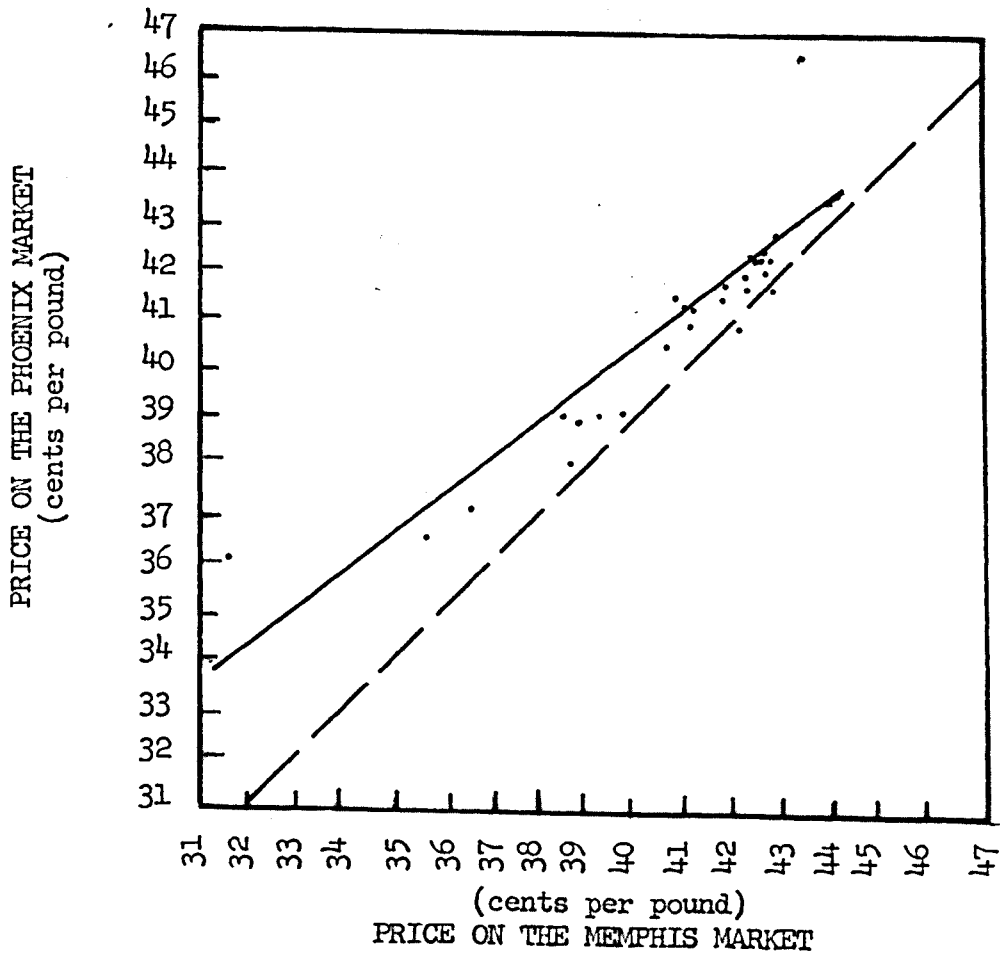


^{31/} Ibid. Page 42.

FIGURE XIX

CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON
ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS.^{32/}
NOVEMBER 15, 1951

r equals .9091
b equals .7595
a equals 2.6585



^{32/} Ibid. Page 42.

FIGURE XX

CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON
ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS. 33/
NOVEMBER 21, 1951

r equals .9229
b equals .5550
a equals 1.6536

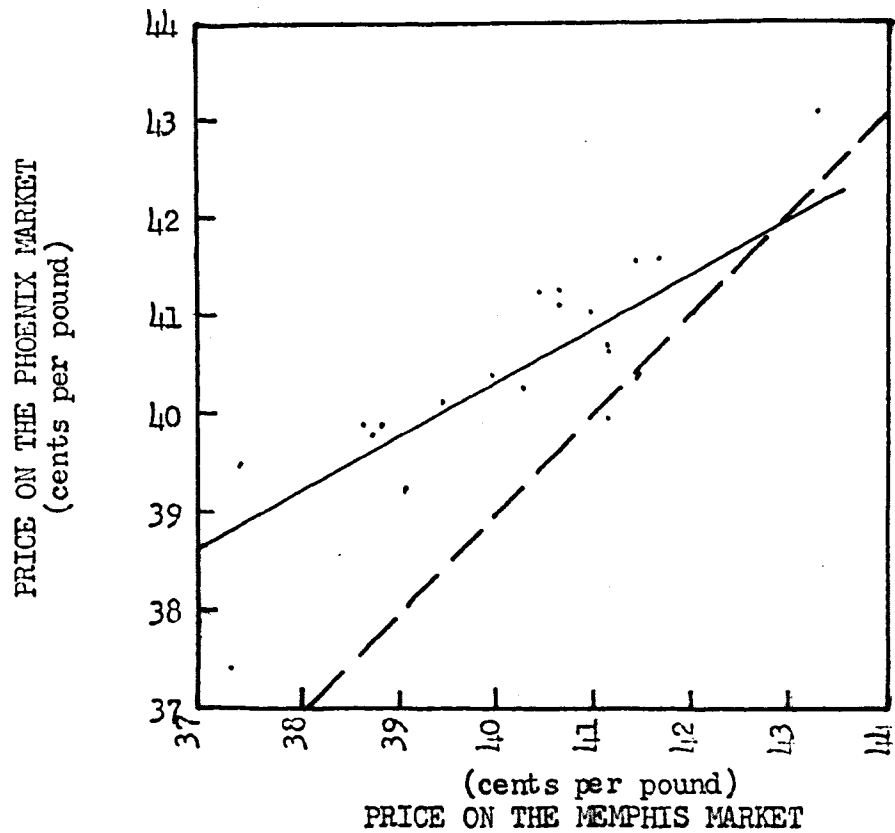


FIGURE XXI

CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON
ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS. 34/
NOVEMBER 29, 1951

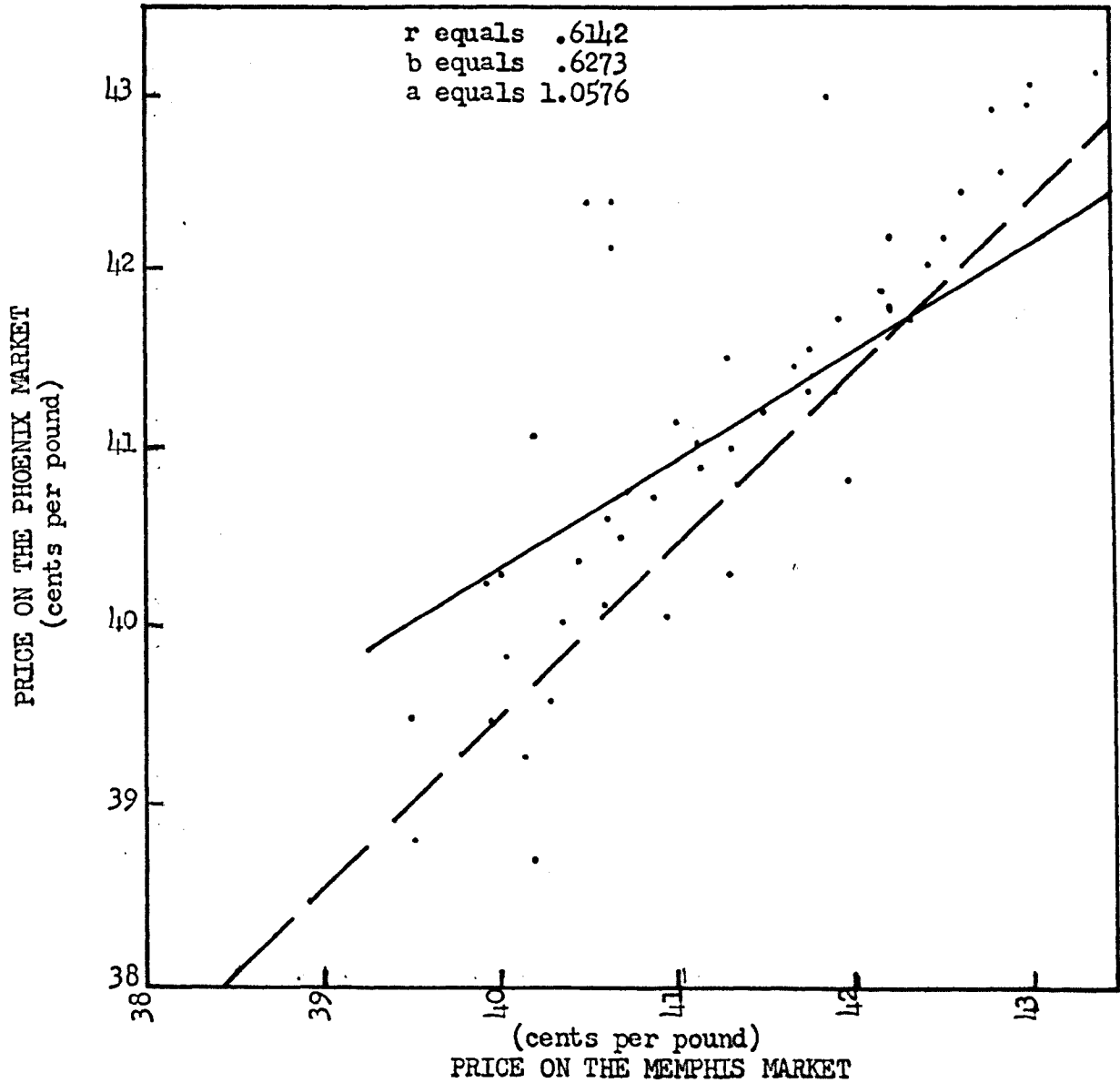


FIGURE XXII

CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON
ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS. 35/
DECEMBER 13, 1951

r equals .7377
b equals .5544
a equals .4412

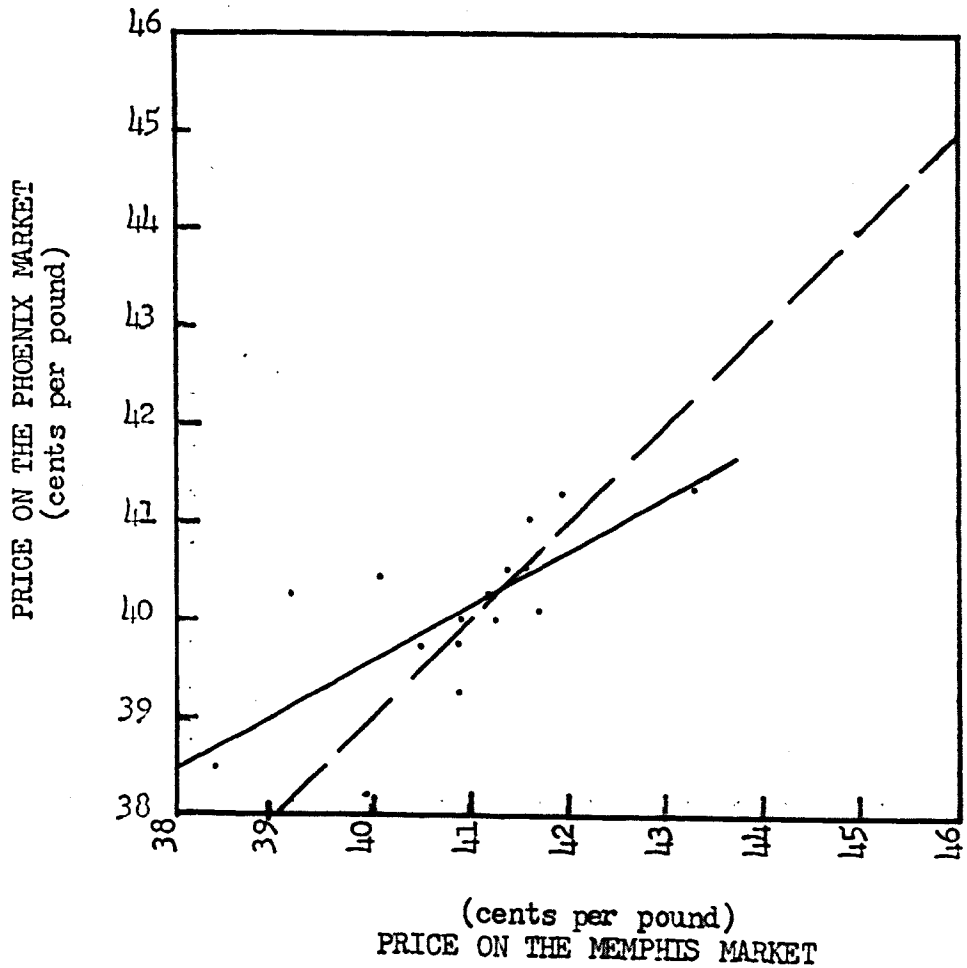


FIGURE XXIII

CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON
ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS. 36/
DECEMBER 20, 1951

r equals .8628
b equals 1.0226
a equals -1.4211

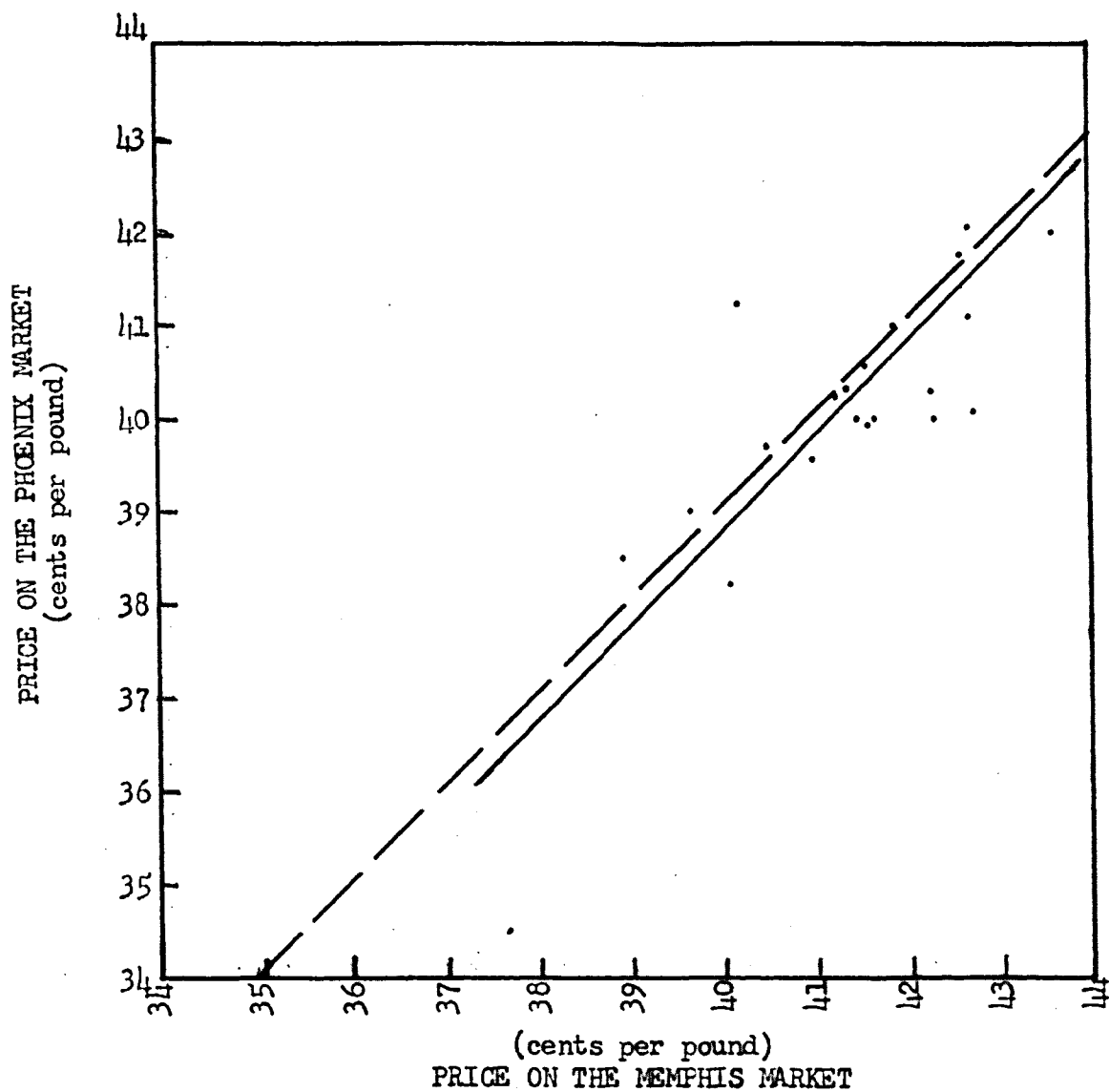


FIGURE XXIV

CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON
ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS. 37/
DECEMBER 27, 1951

r equals .8876
b equals .8576
a equals -.9906

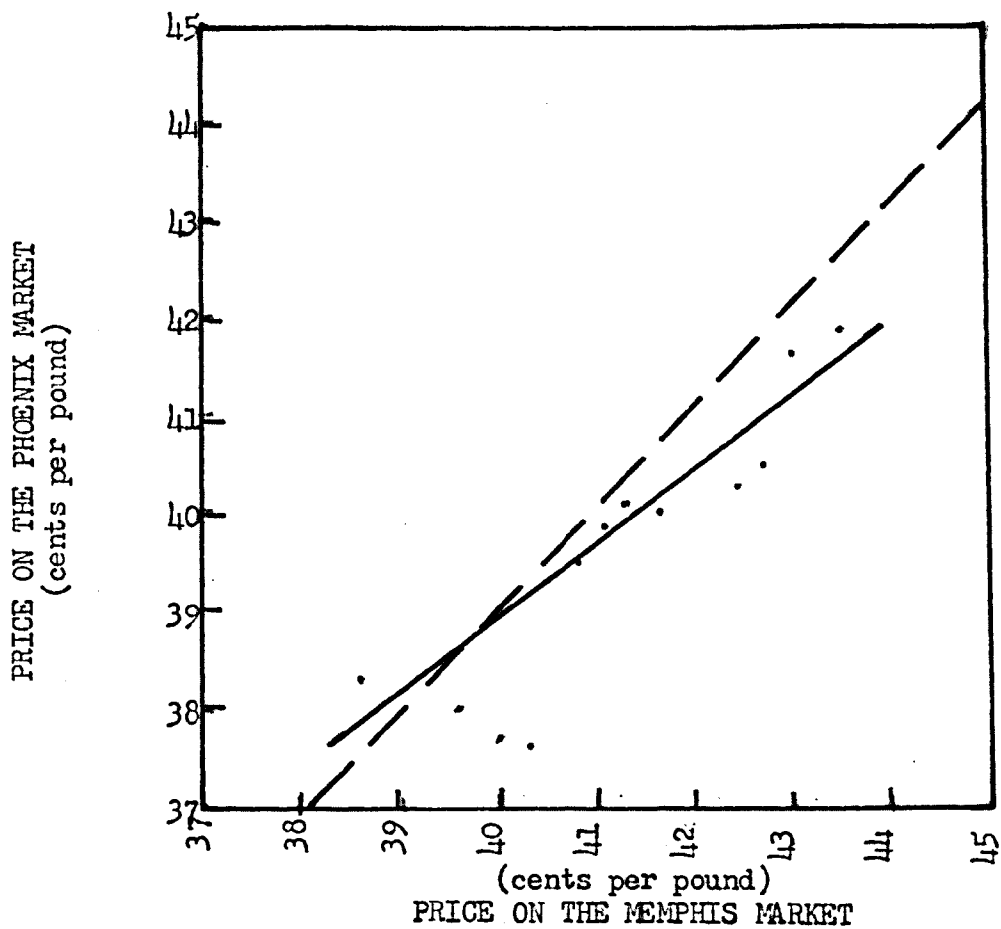


FIGURE XXV

CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON
ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS. 38/
JANUARY 10, 1952

r equals .7913
b equals .6547
a equals .6255

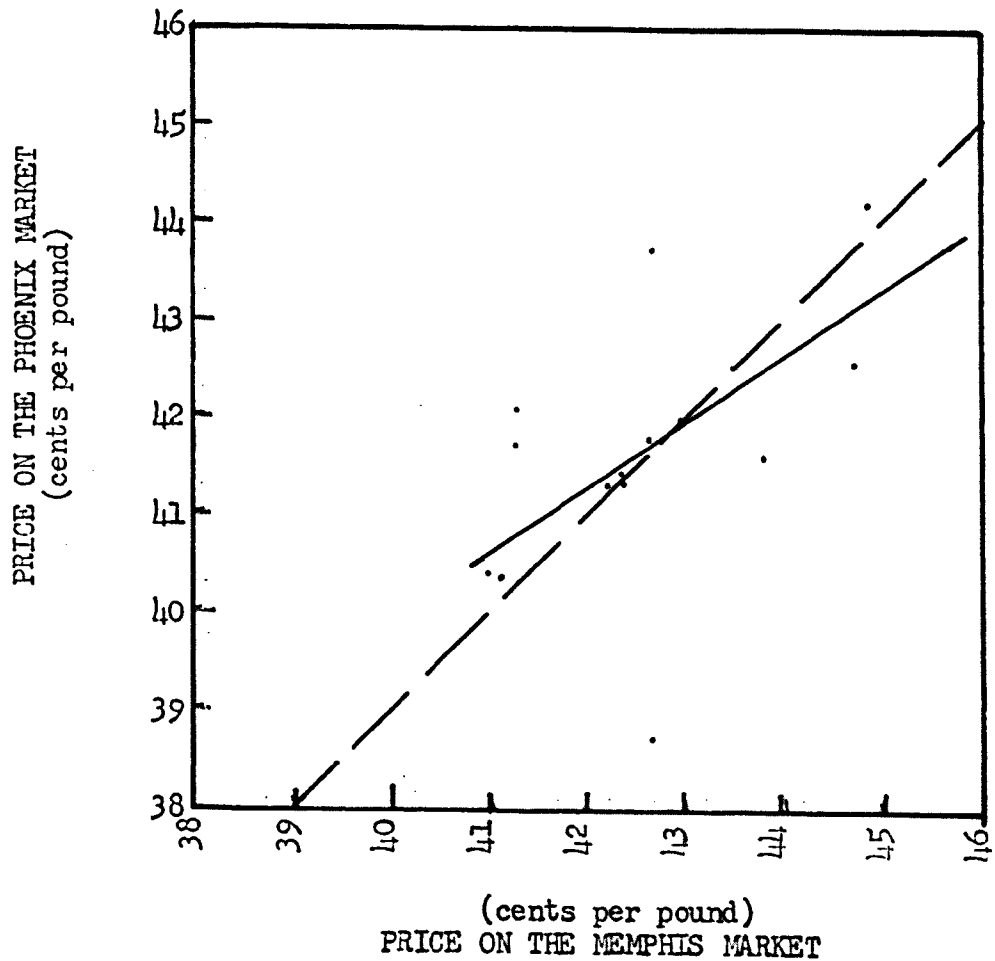


FIGURE XXVI

CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON
ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS. 39/
JANUARY 24, 1952

r equals .9547
b equals 1.0387
a equals -1.1616

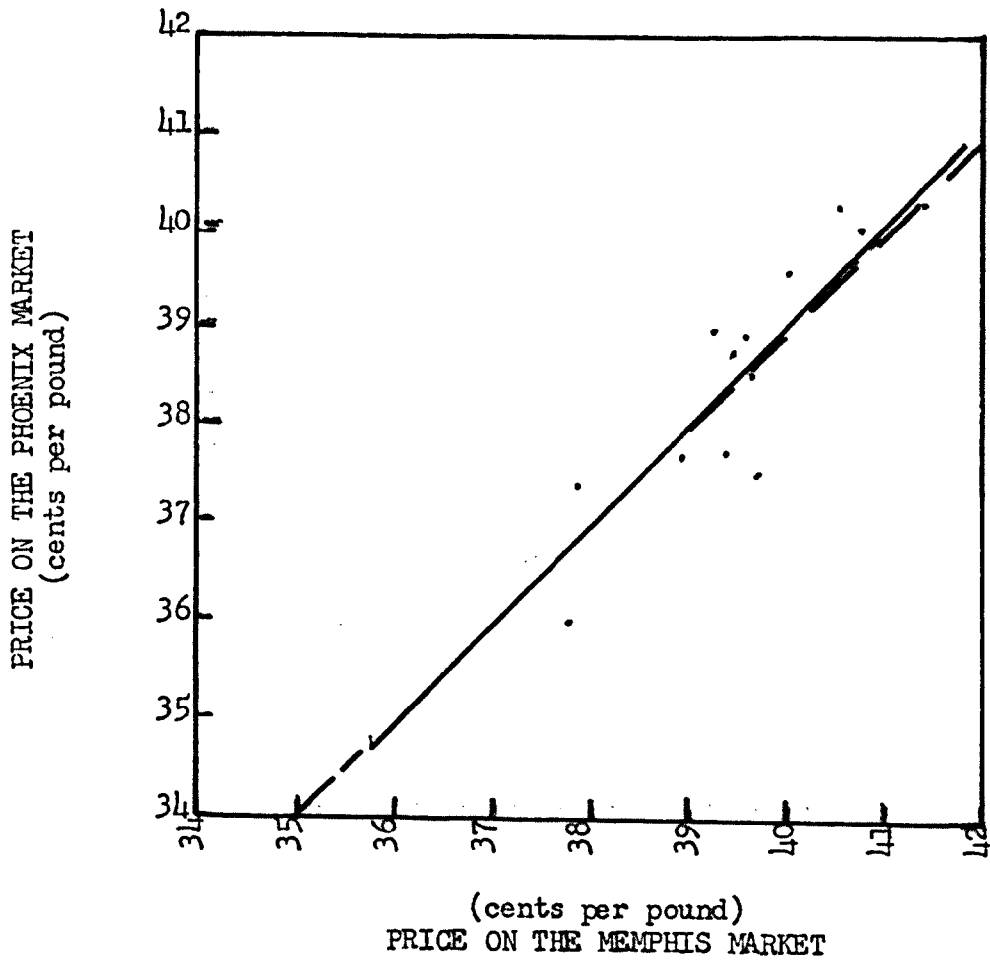


FIGURE XXVII

CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON
ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS. 40/
FEBRUARY 7, 1952

r equals .9037
b equals .8102
a equals .1326

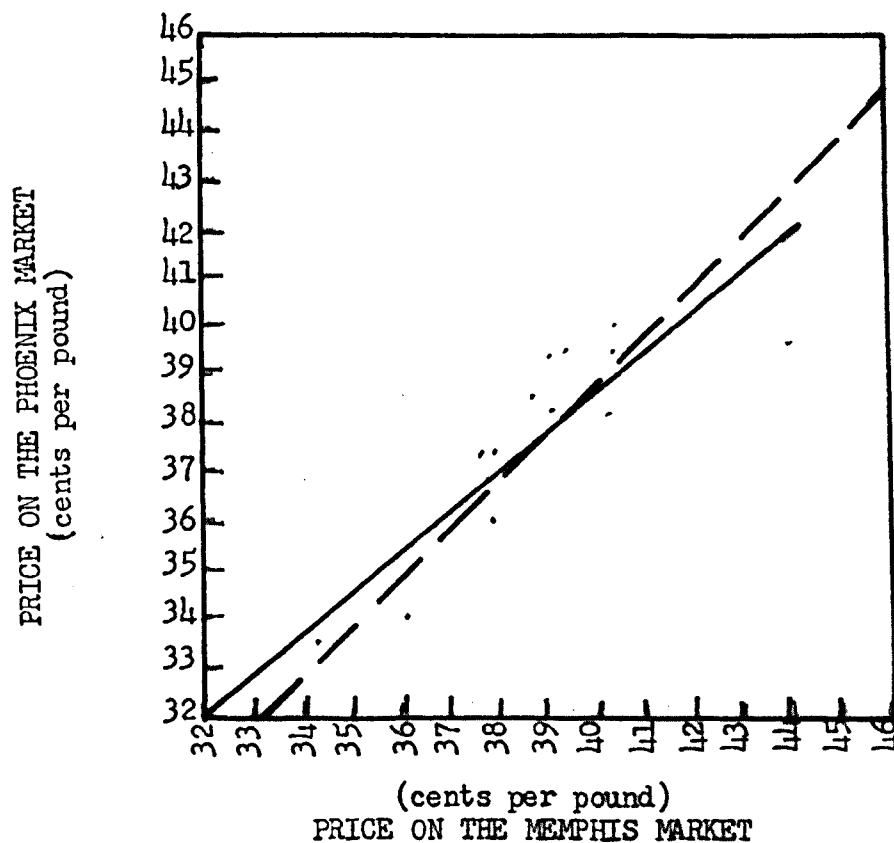


FIGURE XVIII

CORREIATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON
ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS. 41/
FEBRUARY 14, 1952

r equals .4858
b equals .7288
a equals -.0473

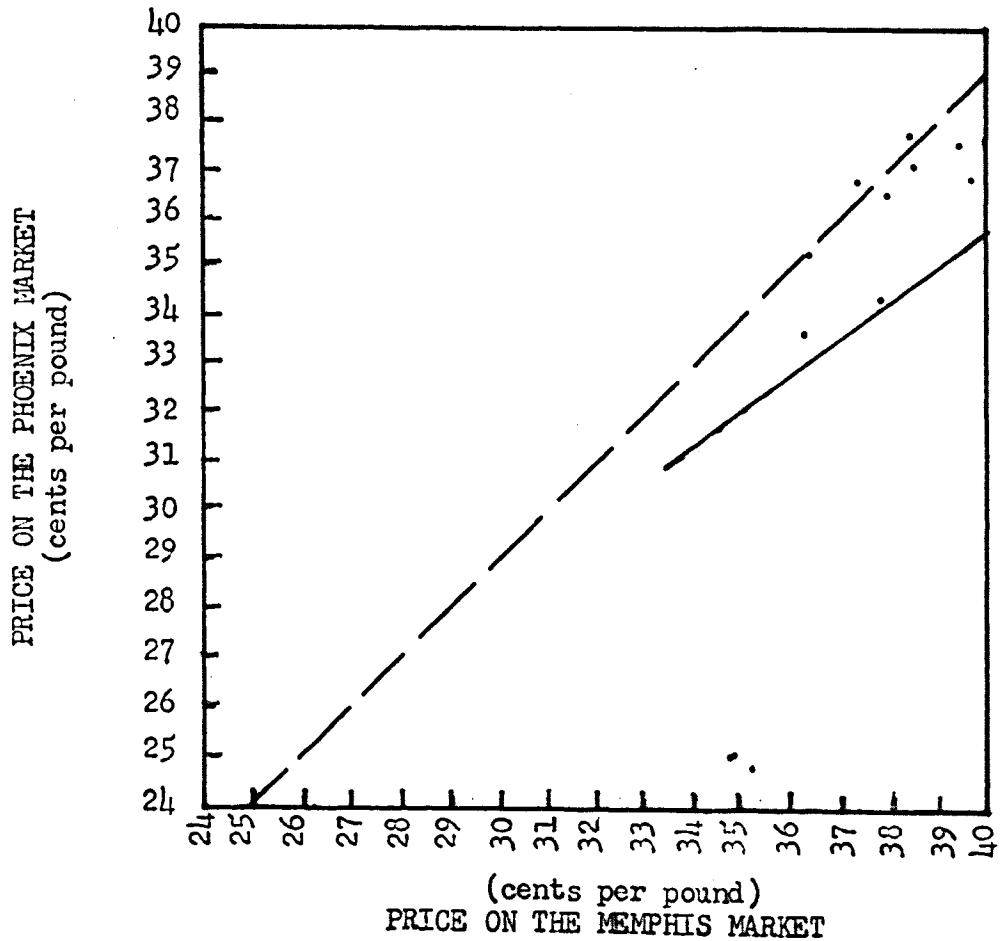


FIGURE XXIX

CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON
ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS. 42/
FEBRUARY 21, 1952

r equals .8112
b equals 1.2018
a equals -5.2988

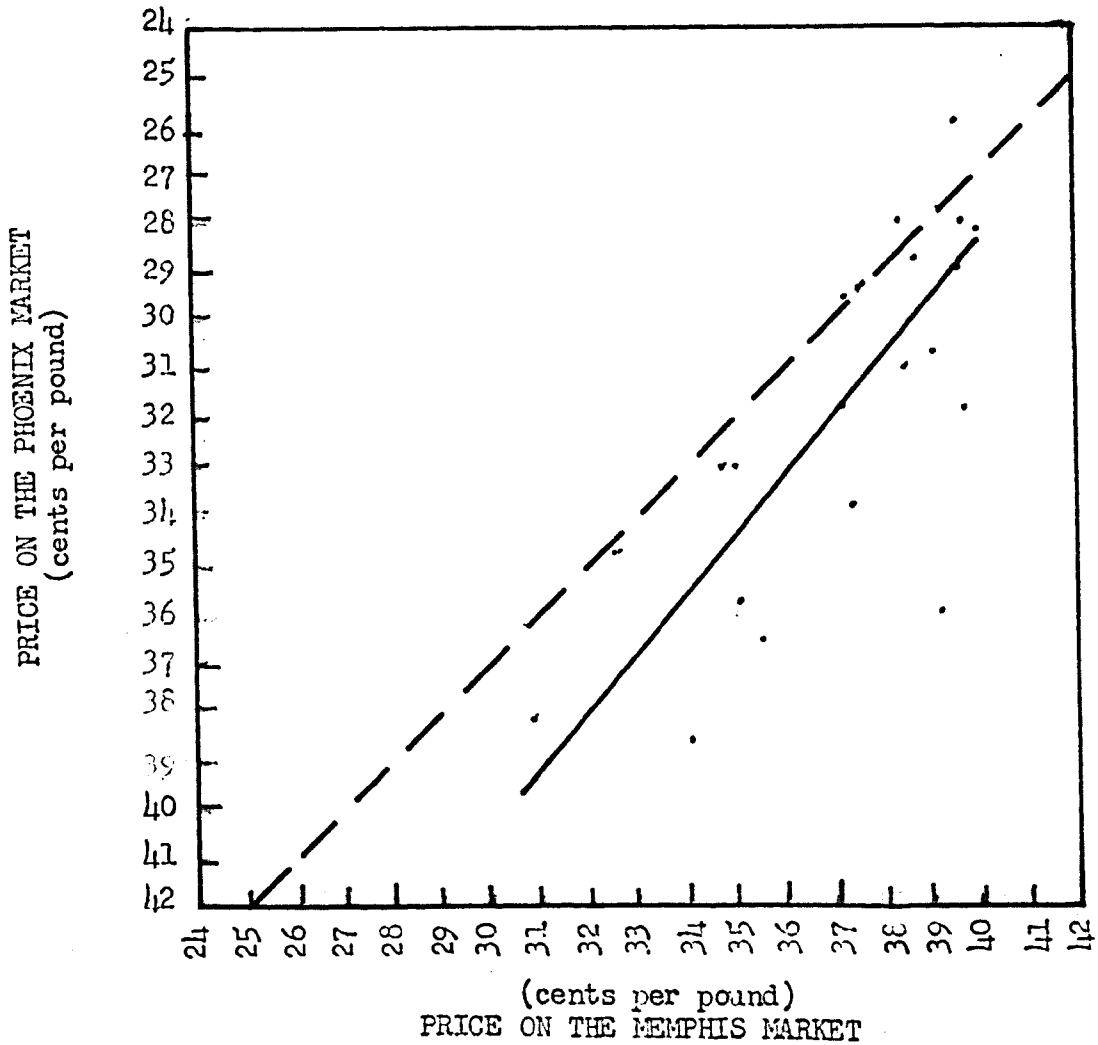
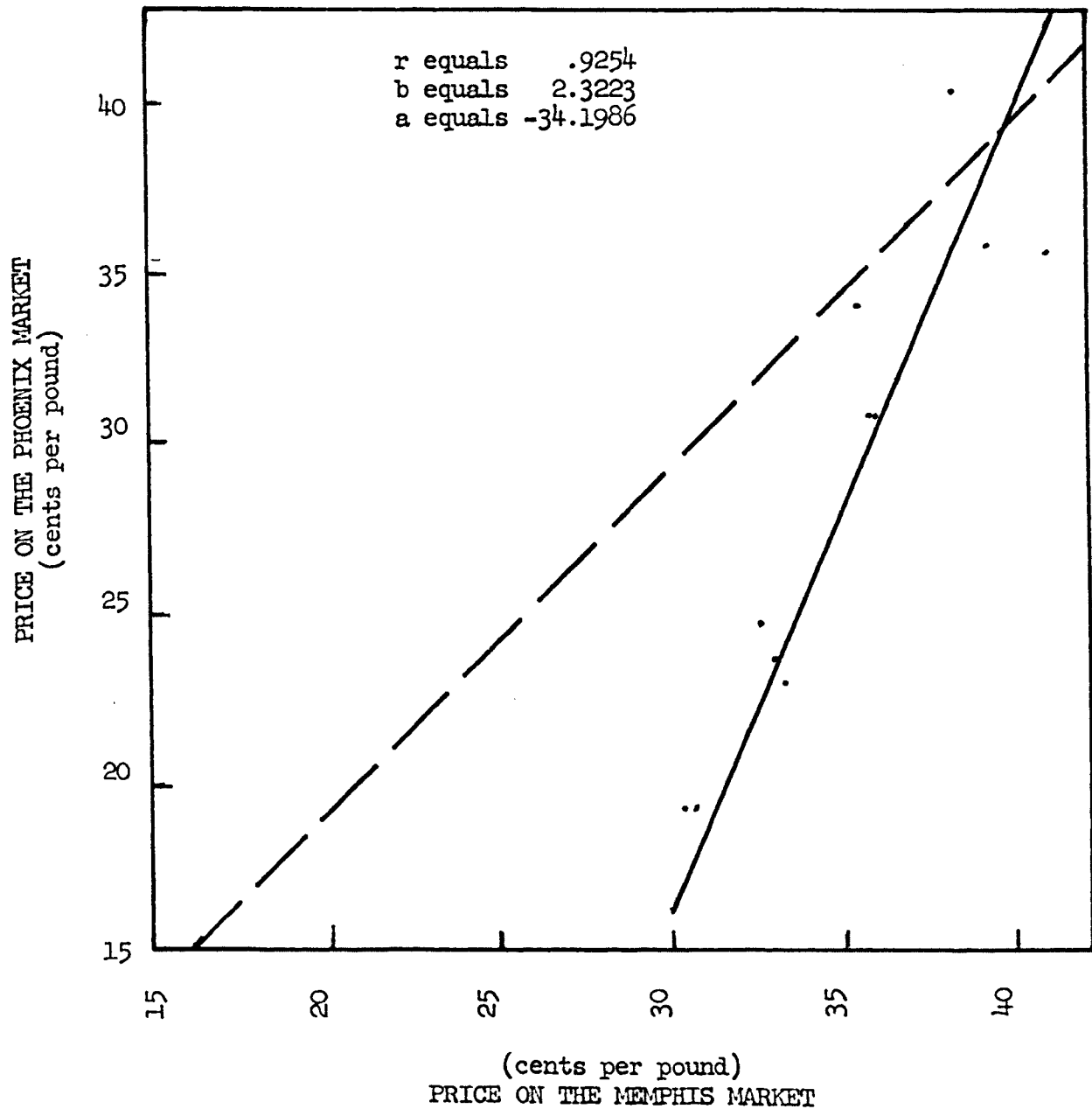


FIGURE XXX

CORRELATION BETWEEN PRICES RECEIVED FOR ARIZONA UPLAND COTTON
ON THE PHOENIX MARKET, AND EQUIVALENT MEMPHIS EVALUATIONS.^{43/}
MARCH 13, 1952



^{43/} Ibid. Page 42.

lower grades and finer fibered cotton which tended toward weakness, wastiness, and nepiness. The line of regression is much steeper than the 1 to 1 ratio, which reflects extreme discounts for lower grades. At the same time the futures market declined rather steeply. Grades were deteriorating and, as a result, the above situation was brought about, where Phoenix prices were much lower than Memphis prices.

Table IX presents comparative Phoenix-Memphis data for the 1951 crop year. Included in this table are the correlation coefficients, the regression coefficients, the "a" values and the standard error of the estimates.

Factors Influencing Spreads Between Local and Central Markets

The major factor that causes a price spread between Phoenix and Central markets is the difference in comparative costs to the Group B or Carolina Mill points. Comparative costs, as outlined in Table X, indicate that it requires 121 points or six dollars and five cents to move a bale of cotton from Memphis to Greenville, South Carolina and 246 points or twelve dollars and thirty cents to move a bale of cotton from Phoenix to Greenville, South Carolina.

As it would naturally be expected, the major difference in the comparative costs of moving cotton is the difference in the freight bill in the two markets. The freight rates from Phoenix, Arizona to Greenville, South Carolina are 159 points or seven dollars and ninety-five cents per bale whereas it only requires 83 points or four dollars and fifteen cents to move a bale from Memphis to Greenville. This one factor accounts for 76 of the 105 points difference between the two markets.

TABLE IX

CORRELATION BETWEEN AMERICAN UPLAND COTTON PRICES
AT PHOENIX AND MEMPHIS, THURSDAYS, 1951 CROP YEAR 44/

<u>Date</u>	<u>Number of Lots Sold</u>	<u>Correlation Coefficient</u>	<u>Regression Coefficient</u>	<u>"a" Value</u>	<u>Standard Error of Estimate</u>
10-4-51	11	.9724**	.7011	1.0006	.4118
10-18-51	36	.9174**	.6964	1.8361	1.1667
10-25-51	23	.9514**	.6090	1.8597	.9240
11-1-51	11	.9317**	.8431	.2409	.6098
11-8-51	51	.9344**	1.0635	-.0641	.9740
11-15-51	32	.9091**	.7595	2.6585	1.8642
11-21-51	21	.9229**	.5550	1.6536	.7893
11-29-51	49	.6142**	.6273	1.0576	.5524
12-13-51	17	.7377**	.5544	.4412	.5524
12-20-51	22	.8628**	1.0226	-1.4211	.8088
12-27-51	12	.8876**	.8576	-.9906	1.5772
1-10-52	15	.7913**	.6547	.6255	1.3662
1-24-52	16	.9547**	1.0387	-1.1616	.4200
2-7-52	17	.9037**	.8102	.1326	.9761
2-14-52	12	.4838	.7288	-.0476	3.8409
2-21-52	23	.8112**	1.2018	-5.2988	2.2063
3-13-52	12	.9254**	2.3223	-34.1986	2.1215

** Significant at 1% level, according to Snedecor, G. W., Statistical Methods, 4th Ed., Iowa State College Press, Ames, Iowa, 1946, Table 7.3, P. 149.

TABLE X

COMPARATIVE COSTS MOVING COTTON TO
GREENVILLE, SOUTH CAROLINA, AUGUST 28, 1951. 45/

	Phoenix to Group B	Memphis to Group B
Gin Loading	5	
Freight	159	83
Compression	28	20
Handling*	15 (Outhandling)	5
Minimum Storage	6	
Hedging	4	4
Interest	5	5
Insurance	4	4
Commission	20	20
TOTAL	246 Points	141 Points

* Handling on the Phoenix market includes unloading, handling in, weighing and sampling upon arrival and loading out at the Compress. Warehouse Tariff No. 11, August 15, 1950 Arizona Compress and Warehouse Co.

45/ Data compiled Agricultural Economics Department, University of Arizona.

Other differences in costs of moving cotton are as follows: gin loading of five points or twenty-five cents and storage of six points or thirty cents per bale for all Arizona cotton and no such costs for the Memphis cotton and finally the differences in handling for Arizona and Memphis cotton of ten points or fifty cents per bale. All cotton received at the compresses in Arizona must be unloaded, handled, weighed and sampled upon arrival and loading out. Because cotton prices on the Memphis market are quoted uncompressed in the warehouse there is no charge levied on the Memphis cotton for inhandling and a charge for outhandling of five points or twenty-five cents per bale. Cotton shipped from both of these markets must be compressed into standard density bales to facilitate handling and shipping to domestic mills. Charges for the compression constitute the final difference in costs of moving cotton. Compression charges for Phoenix cotton are 28 points or one dollar and forty cents per bale whereas Memphis charges are 20 points or one dollar per bale.

The other factors that add to cost for moving a bale of cotton are assumed to be equal for both markets. These costs are: Hedging four points or twenty cents; Interest five points or twenty-five cents; Insurance four points or twenty cents; and the commission for selling the cotton 20 points or one dollar.

Other Costs

Ordinarily cotton merchants will require a mill price for cotton which will give them a margin of approximately 50 points above the 246 points of the itemized costs found in Table X. This 50 points includes an allowance for their office overhead and an "opportunity cost" or necessary profit to induce them to make the transaction.

CHAPTER IV

SUMMARY AND CONCLUSIONS

1. Since 1940 Arizona acreage, production and yield indices have increased more rapidly than the United States average as a whole.
2. The higher grades of cotton are predominant at the beginning of the season and the tendency is for the cotton to decline to lower grades at the end of the crop year. A decline such as this occurs because of: (1) mechanical picking, (2) deterioration of the cotton in the boll on the stalk because of weather influences, and (3) rough harvesting practices toward the end of the season.
3. The medium staple lengths, $1 \frac{1}{32}$ and $1 \frac{1}{16}$ inch, are predominant in the middle of the season. The shorter lengths, below $1 \frac{1}{32}$ inch, are predominant at both the beginning and the close of the season because of greener cotton in the first stages of picking and perished cotton at the end of the season. The highest proportion of the unusually long stapled cotton seems to occur a few weeks after the beginning of the season.
4. The Arizona grade index declines from approximately a Middling grade at the beginning of the season to a Strict Low Middling at the end of the season.
5. Overpayments based on the constant dollar margin line existed in the Phoenix market in the beginning of the 1951 crop year. This overpayment was a result of forward sales on the part of the cotton merchants with the expectation that the higher grades of cotton would

be available in sufficient quantities to fulfill all commitments.

However, these quantities were not present and higher prices resulted for all grades which could be used to fulfill contracts.

6. Overpayments were also evident in early November as a result of speculation that cotton prices would reach the established ceiling of \$45.39.

7. The normal market, as expected, was evident during the period November 29, 1951 through February 7, 1952. This period was normal in that the line of regression and constant dollar margin line are either equal or cross, resulting in some overpayments and some underpayments.

8. Underpayments on Arizona cotton in the Phoenix market was evident during the end of the season. This underpayment was a result of lower grades and finer fibered cotton which tended toward weakness, wastiness, and nepiness.

9. The major factor that causes a price spread between Phoenix and Central markets is the differences in comparative costs of moving cotton to the Group B or Carolina Mill points. Using a difference of 105 points, this would mean that the expected Phoenix price would be the Memphis evaluation minus 105 points.

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APPENDIX I

FIELD SCHEDULES USED IN GATHERING DATA

RECAPITULATION SHEET PRICE - QUALITY STUDY								TOTAL B/C
Producing Region	Date of Sale							
Variety.....	15/16	31/32	1"	1/32	1/16	3/32	1/8	TOTAL
(3) Good Midd.								
Plus								
(4) St. Midd.								
Plus								
(5) Middling								
Plus								
(6) St. Low Mid.								
Plus								
(7) Low Mid.								
Plus								
(8) St. Good Ord.								
Plus								
(9) Good Ord.								
Lite								
Good Midd. Spotted								
Lite								
St. Midd. Spotted								
Lite								
Middling Spotted								
Lite								
St. Low Midd. Spotted								
Lite								
Low Midd. Spotted								
Good Middling								
Tinge								
Gray								
Strict Middling								
Tinge								
Gray								
Middling								
Tinge								
Gray								
Strict Low Middling								
Tinge								
Gray								
Low Middling								
Tinge								
Gray								
Other.....								
Below Grade.....								
TOTAL.....								

Fix price on N.Y. _____ Points on or off _____
 (month)

() Today's Close () Tomorrow's Open Price per lb. _____

Remarks: _____

APPENDIX II

STANDARDS FOR LENGTH OF STAPLE AMERICAN UPLAND COTTON 46/

$3/4$ and below
 $13/16$
 $7/8$
 $29/32$
 $15/16$
 $31/32$
1
1 $1/32$
1 $1/16$
1 $3/32$
1 $1/8$
1 $5/32$
1 $3/16$
1 $7/32$
1 $1/4$
1 $9/32$
1 $5/16$
1 $11/32$
1 $3/8$
*1 $13/32$
*1 $7/16$
*1 $15/32$
1 $1/2$

*Descriptive standards and do not apply to American Upland Cotton.

