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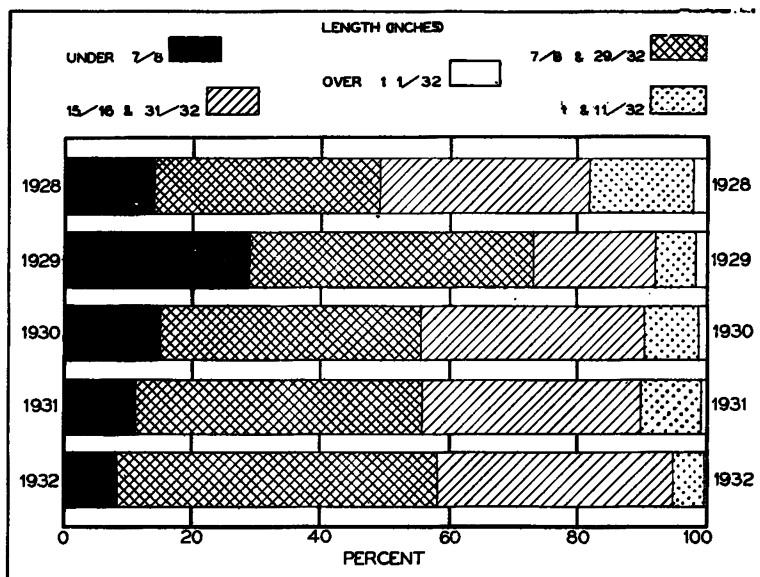
**ECONOMIC ASPECTS OF THE GRADE AND STAPLE
 LENGTH OF COTTON PRODUCED IN
 OKLAHOMA**

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The proportion of both short staple and long staple cotton produced in Oklahoma declined from 1928 to 1932, while the proportion of medium staple lengths increased.

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SUMMARY

In general the cotton produced in Oklahoma during the period, 1928 to 1932, averaged slightly lower in grade and shorter in staple length than that produced in the United States. Approximately one-half of the cotton produced in Oklahoma was white middling and better in grade, while in the United States a little over two-thirds of the cotton was of these grades. In Oklahoma, 58.4 percent of the cotton produced from 1928 to 1932 was 29/32 inch and under in staple length, and in the United States 51.3 percent of the cotton was of these lengths. Only 10.5 percent of Oklahoma's cotton during the period was one inch and longer, as compared with 24.2 percent of the United States crop. There was a decrease in the proportions of short cotton produced in both Oklahoma and the United States during the period. In Oklahoma, cotton with a staple length of less than 7/8 inch in length dropped from 28.6 percent in 1929 to 8.0 percent in 1932, and in the United States the proportions of these lengths of cotton dropped from 20.1 percent in 1929 to 6.5 percent in 1932. These marked changes are not necessarily representative of permanent improvement to this extent, since quality is greatly influenced by seasonal variations in weather and other factors.

The grades of cotton averaged lower and the staple lengths shorter in the western areas of Oklahoma than in the eastern areas during the period studied. In Area 3, located in the extreme southwestern part of the State, an average of 47.4 percent of the cotton was white middling and better in grade, while in Area 10, located in the extreme southeastern corner of the State, 73.1 percent of the cotton was of these grades. In Area 3, an average of 74.8 percent of the cotton produced was 29/32 inch and under in staple length, while in Area 10 only 13.3 percent of the cotton produced was of these lengths. In Area 3, an average of only 2.9 percent of the cotton produced was one inch and longer, while in Area 10, 60.1 percent of the cotton produced was of these lengths.

A large proportion of the better grades and longer staple lengths of cotton is ginned in the early part of the ginning season in Oklahoma than is true of the shorter cotton of lower grades. Cotton ginned early in the season is subject to less weather damage than other cotton and most of the long staple cotton produced in the southeastern areas of the State where cotton is planted, matures and is harvested earlier than in the western areas.

The varieties of cotton most commonly grown in Oklahoma are Half and Half, Acala, Mebane and Oklahoma Triumph 44. These varieties made up approximately three-fourths of the cotton produced in the State during the four years, 1928 to 1931. Half and Half cotton is grown largely in the western and southwestern areas of the State. There has been a marked decrease in the proportions of this variety grown in the past few years. Mebane, Acala, and Oklahoma Triumph 44 varieties are grown in all areas of the State.

The method of harvesting cotton by "snapping" or pulling the burr off with the cotton has become one of the principal ways of harvesting in western Oklahoma, but is less prevalent in the eastern part of the State. In 1924, 20.2 percent of the cotton produced in Oklahoma was harvested by snapping, and in 1931, 51.1 percent of the cotton was harvested in that manner. The largest increase in the practice occurred in the western and southwestern areas of the State. Some of the factors associated with the harvesting of a large percentage of cotton by snapping are large cotton acreages per farm, insufficient harvesting labor, a combination of large production and low prices for cotton, and adverse weather conditions during the harvesting season.

The variations in staple lengths of cotton produced in various sections of Oklahoma are associated fairly closely with differences in the amount of rainfall during the year and the varieties of cotton grown. In the eastern areas of the State, where the average rainfall ranges from 35 to 45 inches, longer staple cotton is produced than in the western areas where the annual rainfall ranges from 25 to 30 inches. The large proportion of short cotton produced in the western areas of the State is also associated with the large quantities of Half and Half cotton grown there.

The variations in grades of cotton produced in the various sections of Oklahoma are associated largely with differences in weather conditions during harvest, the method used in harvesting, and in some cases the character of the soil. In years of heavy rainfall, during harvest, the grades of cotton in any one section are poorer than in years when the harvest season is dry and open. This is not true when comparisons are made between different sections of the State because of differences in other conditions. The harvesting of cotton by snapping is also associated to some extent with heavy rainfall during the harvest season and this practice also lowers the grades of cotton. Thus some of the low quality of cotton usually attributed to snapping is in reality a result of excessive rainfall during the harvest season. Other factors which affect the quality of cotton after it has been harvested are its condition when ginned and the care with which it is ginned.

ECONOMIC ASPECTS OF THE GRADE AND STAPLE LENGTHS OF COTTON PRODUCED IN OKLAHOMA¹

Roy A. Ballinger and Clyde C. McWhorter

Introduction

Cotton is the most important crop in Oklahoma. During the five years from 1926 to 1930, the farm value of cotton and cottonseed averaged approximately \$102,590,000, or 42.5 percent of the total farm value of all the leading crops produced in the State, as shown in Table 1. Oklahoma is a very important state in the production of cotton, having an average annual production of over one million bales. The only states with an average production larger than Oklahoma during the last five years are Texas, Mississippi, Georgia, Alabama and Arkansas. Cotton is produced to some extent in all areas of Oklahoma except in a few counties along the northern boundary of the State, and in the Panhandle counties; however, the major part of the crop is produced in the southern half of the State. Figure 1 shows the distribution of cotton production in Oklahoma in 1932.

There has been a steady increase in the amount of cotton produced in Oklahoma during the past several years which has been accompanied by a gradual westward shift in the areas of heaviest production. This shift may be attributed largely to the advance of the boll weevil in the eastern and southeastern areas of the State, and the growth of mechanized farming in the western areas.²

One of the important problems confronting the cotton farmers in Oklahoma, as well as other cotton-producing areas, is that of determining the kind of cotton they should endeavor to produce. Differences in economic and physical conditions in the various sections of this State and other

TABLE 1.—Farm Value of Crops Produced in Oklahoma, 1926-1930¹
(1,000 dollars)

Crop	Average	Percentage distribution	1930	1929	1928	1927	1926
Total	\$240,741	100.0	\$125,835	\$238,932	\$285,496	\$263,021	\$290,420
Cotton and cottonseed	102,590	42.5	45,775	107,662	123,269	122,892	113,352
Wheat	50,111	20.8	19,881	44,033	59,576	40,046	87,019
Corn	38,698	16.2	23,683	38,173	47,702	49,672	34,260
Oats	10,743	4.5	9,778	9,884	10,876	9,296	13,882
Other crops ²	38,599	16.0	26,718	39,180	44,073	41,115	41,907

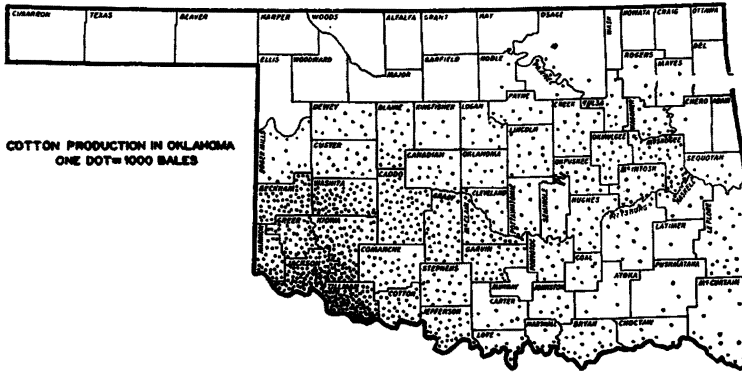
¹Adapted from Statistical Abstracts of the United States for 1927, 1930 and 1931.

²Includes barley, rye, potatoes, sweet potatoes, tame hay, wild hay and minor crops. In instances where farm values were not given, production was multiplied by the average farm price to obtain the values.

¹Acknowledgement is made to Mr. W. B. Lanham, Senior Agricultural Economist, and to Mr. A. M. Dickson, Associate Agricultural Economist, of the Bureau of Agricultural Economics, United States Department of Agriculture, for assistance in connection with various phases of this study. The basic data used in this study were secured in cooperation with the Bureau of Agricultural Economics of the United States Department of Agriculture.

²Ellis, L. S., Shifts in Oklahoma Crop Acreages, Oklahoma CURRENT FARM ECONOMICS, February, 1932, Series 49, Volume 5, No. 1, page 8.

Cotton Production in Oklahoma, 1932-33 Crop



DEPARTMENT OF AGRICULTURAL ECONOMICS

OKLAHOMA A & M COLLEGE

Figure I. Some cotton is produced throughout Oklahoma except in the extreme northern part. However, the largest production occurs in the southwestern part of the State.

areas are apparently largely responsible for the differences in the kind of cotton the farmers produce. Some of these conditions are uncontrollable so far as the farmers are concerned, while other conditions are more or less subject to control. Because of these varying conditions, it may be more profitable in one section to produce $7/8$ inch cotton while in another section there may be more profit in growing $1\ 1/8$ inch cotton. The value of different kinds of cotton is largely determined by the relative demand and supply of each kind. The relative profitableness of producing the different kinds of cotton depends upon the varying costs of production as well as the price of each kind of cotton.

The local marketing system in Oklahoma and other states influences to a considerable degree the quality of cotton that farmers produce. In a system of local markets where average, point, or "hog round" buying is practiced to a large degree, that is, where no difference is made in price for different grades and staple lengths, the individual farmer has very little inducement to produce a high quality product which will sell for a premium in the central markets. This is particularly true since it normally costs somewhat more to produce a bale of long staple than a bale of short staple cotton. The lint turnout for long staple cotton is usually lower than it is for the shorter staple; consequently, it takes more pounds of seed cotton to make a bale of lint, and ginning costs are higher for long staple cotton because the charge for ginning is based on the amount of seed cotton. The lower turnout also increases the picking costs for a bale of lint, since these costs are also based on the amount of seed cotton. The farmers who bring in high grade, long staple cotton receive, on the average, a price very little or no higher than that received by those who bring in low grade, short staple cotton. A large proportion of the local markets in Oklahoma are gin buyers' markets. The gin operators not only gin the cotton but also buy it. Frequently in these markets very little effort is made to vary the price paid according to different grades and staple lengths of the cotton. However, a study by the United States Department of Agriculture shows that in 1928

the prices received by growers in local markets in Oklahoma varied so much that in instances considerably higher prices were received by farmers for low grade, short staple cotton than others received for high grade, long staple cotton.² The study further shows that the average premiums received by growers for grades above middling amounted to only about four-fifths of those paid in central markets, and that the average discounts which the growers received for grades below middling amounted to a little over one-half of the central market discounts. The study also shows that the average price paid the growers for cotton with a staple length of less than 7/8 inch amounted to only 45 cents per bale less than that paid for 7/8 inch cotton, while similar discounts in the central markets were \$2.50 per bale.

Objects of Study

The general objective of this study is to supply cotton farmers with more reliable information concerning the grade and staple length of the cotton produced in the different parts of Oklahoma and the United States so that they will be in a better position to adjust their production so as to meet the needs of cotton consumers more effectively. Such information should also enable them to judge more accurately as to the price they should receive for their cotton when they sell it in their local markets.

The particular objects of this study are to supply information showing the kind of cotton produced during the last five years and also to show the relationship between certain practices and conditions which apparently influence the quality of cotton produced, so that farmers may have a better basis on which to judge as to the kind of cotton they should produce in order to secure the largest profits. The grade, staple length, and tenderability of cotton produced in Oklahoma during the five-year period, 1928 to 1932, is compared with that produced in the United States. Similar comparisons are made of the quality of cotton produced in various sections of the State during this period and of the quality of cotton ginned in Oklahoma during different periods of the ginning season. The relationship existing in various sections of the State between soil conditions, weather conditions, varieties grown, methods of harvesting and other factors and the quality of cotton are studied and their significance pointed out.

Method of Procedure

During each of the five years from 1928 to 1932, the Division of Cotton Marketing of the United States Department of Agriculture, cooperating with the various state agricultural experiment stations, has collected and published information on the grade, staple length, and tenderability of cotton produced in the various cotton-growing states and in the United States. In Oklahoma the work has been carried on as a cooperative project by the Oklahoma Agricultural Experiment Station and the Division of Cotton Marketing. As a result of this work statistics have been collected, prepared, and released periodically during the ginning season on the grade and staple length of cotton grown in the cotton states and in the country as a whole.

The data on which the reports for the grade and staple length of Oklahoma cotton are based were obtained by the classing of actual samples of cotton furnished by gins located throughout the State. These gins were selected so as to give a cross-section of the cotton ginned in the State, and in their selection special attention was given to the size of gin plant, volume of business, varieties of cotton produced in the area, kinds of soils in the area and other factors which might influence the quality of the cotton. A sufficient number of these gins were selected to represent approxi-

²Howell, L. D., *Farm Prices of Cotton Related to Quality, Oklahoma Crop, 1928-1929*, United States Department of Agriculture, Washington, D. C., Preliminary Report, April, 1931, pages 22 and 23.

mately seven to ten percent of the cotton produced in the State. This seven to ten percent sample was used to estimate the grade and staple length of the cotton produced in the State. Figure II shows the location of these gins for the season 1932-33.

After desirable gins were selected, arrangements were made with the gin managers to furnish samples of cotton from every bale they ginned during the season. These samples were sent to the regional classing office of the Division of Cotton Marketing at Dallas, Texas, where they were classed by government cotton classers according to official government standards in a classing room equipped with light, temperature and humidity controls according to government specifications. The individual class of each bale was listed and mailed to the Washington office where they were combined into reports. The same method was used in collecting data for the other cotton states, the individual states being units of the country at large.

In order to make a more detailed analysis of the grade, staple length, and tenderability of cotton produced in various sections of Oklahoma, and of the effects on the quality of cotton produced, of certain conditions such as weather, varieties grown, method of harvesting, differences in soils and other factors, the State was divided into eleven areas. The boundaries of these areas are shown in Figure II. In determining the boundaries of these areas, counties with similar methods of producing and harvesting cotton were grouped together as far as possible.

Cotton Areas of Oklahoma on Which Study is Based

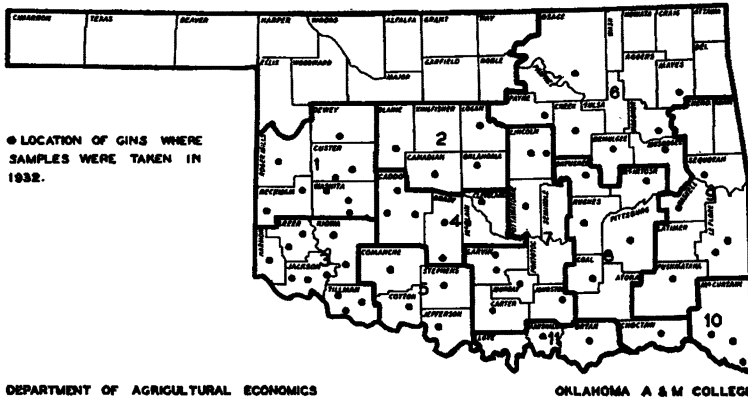


Figure II. The cotton-producing sections of Oklahoma were divided into eleven areas. Conditions of production and marketing are somewhat uniform within each area.

MEASURES OF QUALITY IN COTTON

The factors which, in a composite form, make up the classification of cotton, giving it its utility value in spinning, are grade, staple length, and character. The classification of cotton is important in cotton marketing because it facilitates the assorting of individual bales into lots of the same grade and staple length, expedites trading by affording the purchaser means of buying upon description of such lots without the examination of actual samples at the time of purchase, and makes possible the determination of comparative values for cotton of different qualities.⁴

⁴Palmer, A. W., Commercial Classification of American Cotton, United States Department of Agriculture, Circular No. 278, pages 2-23.

The standardization of cotton classification in this country grew out of an act passed in August, 1914, known as the United States Cotton Futures Act which provided, among other things, for the establishment and promulgation of Official Cotton Standards of the United States. Since that act was passed, standards have been promulgated under the Cotton Standards Act for 37 grades and colors and for 20 staple lengths of American Upland cotton now given in the Universal Standards for American cotton which are accepted in this and other countries as official.⁵

Human elements enter quite strongly into cotton classing. Expert cotton classers do not always agree in their classifications. It is easy to see that there would be a certain amount of variation in their classification in that two individuals rarely ever respond to the same degree to certain stimuli where the sense of sight and touch are involved. However, through constant training and experience, cotton classers have been able to eliminate these differences to a large degree. The difficulty of doing this well has made cotton classing one of the most skilled occupations.

Other conditions which may influence the accuracy of cotton classing are kind of light, humidity of atmosphere, moisture content of cotton, and temperature. These factors are controlled to some degree in official cotton classing rooms. However, in open yard and field classifications, it is usually impossible to keep these conditions constant.

Grade

Grade denotes a combination of the color, luster and brightness; the nature and amount of foreign matter present in the lint, such as leaves, dust, notes, or other foreign matter; and the preparation or ginning of the cotton.⁶ In each grade of cotton the proportions of grade elements may vary somewhat. For example, a bale of cotton may be slightly better in color than is required for middling cotton, but have an excess in foreign matter such as leaf. The extra brightness in grade may compensate for the excess trash, that is, if both factors are within the limits allowable in the grade. A cotton classer in determining the grade of cotton compares it to official government standards or "types" carried in his mind as a result of constant reference to the original. He weighs all the elements of grade in his mind and assigns to each bale a grade which as nearly as possible corresponds to the standard.

Color is a term used to describe the hue, such as yellow or blue, the brilliance or brightness, and the chroma, such as the degree of strength of the color, which is the degree of creaminess or stain in cotton. Color is graduated progressively from extra white through white, spotted, yellow tinged, light yellow stained to yellow stained, and from white through gray to blue stained, these colors being the major color schemes on which grade standards are based. There is also some variation of color from the higher to the lower grades, particularly in brightness.⁷

Foreign matter in the form of leaves, parts of limbs and burrs, dirt, notes, and other forms, increases in quantity from the higher to lower grades. Foreign matter is constant in corresponding grades of different colors such as middling white and middling tinged.

Preparation is a term used in the classification of cotton to describe its smoothness or roughness as resulting from the ginning process. Preparation is determined by the degree in which normal fiber lengths are maintained and in the form in which they are blended together after ginning. The appearance of "roughness," "stringiness," "ropiness," and "nappiness" indicate poor preparation. Table 2 shows the grades subdivided by color of the Universal Standards for American Upland Cotton.

⁵Cox, Alonzo B., *Services in Cotton Marketing*, United States Department of Agriculture, Bulletin No. 1448, pages 8 and 9.

⁶Palmer, loc. cit.

⁷Handbook for Licensed Classers, United States Cotton Standard Act, Mimeographed report, October, 1930, United States Department of Agriculture, pages 6-10.

TABLE 2.—Grades and Colors for American Upland Cotton

Extra white ²	Blue stained ²	Gray ²	Standards for grades of upland cotton, white ²	Spotted ²	Yellow tinged ²	Light stained ²	Yellow stained ²
			1. Middling fair				
			2. Strict good middl'g		2 Y.T.		
3 E.W.	3 B.	3 G.	3. Good middling	3 Sp.	3 Y.T.	3 L.S.	3 Y.S.
4 E.W.	4 B.	4 G.	4. Strict middling	4 Sp.	4 Y.T.	4 L.S.	4 Y.S.
5 E.W.	5 B.	5 G.	5. Middling	5 Sp.	5 Y.T.	5 L.S.	5 Y.S.
6 E.W.			6. Strict low middling	6 Sp.	6 Y.T.		
7 E.W.			7. Low middling	7 Sp.	7 Y.T.		
			8. Strict good ordina'y				
			9. Good ordinary				

¹Palmer, Arthur W., Commercial Classification of American Cotton, United States Department of Agriculture, Circular No. 287, page 7. Revised to date from Handbook for Licensed Classers, Mimeographed report, U. S. D. A., page 7.

²Symbols in boldface type represent the designations of cotton which in color is between the practical forms and on which no practical forms have been prepared.

³Symbols in regular type denote grades and colors for which practical forms or government boxes of official cotton standards are prepared.

The grades shown above the black lines are deliverable on futures contract in accordance with Section 5 of the United States Cotton Futures Act; those below are not deliverable.

Staple Length

The staple length of cotton, in this country, means the measurement of a selected portion of fibers in inches and fractions thereof. These portions of fibers are selected by "pulling" a typical bundle of the fibers from the sample of cotton. The determination of staple lengths of cotton is an involved process, requiring much practice and skill. The cotton classer, in determining the length of fibers in a sample of cotton, breaks the sample, and at random selects "pulls" of fibers with the thumb and forefinger from the "break." He "smooths" or "combs" the "bundle" of fibers and then pulls the irregular ends resulting from the unevenly placed fibers, and fibers of extra length. The resulting "bundle" is composed of fibers of more or less the same length which represent a fair sample of the length of the fibers in the bale. He either measures these fibers, which are typical fibers of the sample, with a cotton rule according to length established in the official United States Cotton Standards for staple length, or estimates their length as a result of experience in pulling actual government types for the various lengths. Staple lengths for which practical forms for American Upland cotton have been prepared range from $3/4$ to $1\ 1/2$ inches. They increase by one-sixteenth inch intervals from $3/4$ to $7/8$ inch and by one-thirty-second inch intervals from $7/8$ to $1\ 3/8$ inches and there is a standard for $1\ 1/2$ inches.

Character

Character, although there is no official standard measuring it, is commonly used to describe such properties of cotton as the body, uniformity, strength, fineness and hardness of cotton. Descriptions such as "hard-bodied," "soft," "weak," "river bottom" are often heard in cotton buying centers. These terms vary in their meanings; however, they are used to describe certain properties of cotton which are related to character.

Tenderability

According to Section 5 of the United States Cotton Futures Act, cotton having a staple length of less than $7/8$ inch in length or a grade among those shown below the black line in Table 2 or a combination of both the short staple and designated grade, is not acceptable in the fulfillment of a futures contract. This cotton is termed "untenderable cotton"; while, on

the other hand, cotton having a staple length of 7/8 inch and longer and a grade which comes above the black line in the table is acceptable in the fulfillment of futures contract and is termed "tenderable cotton." Untenderable cotton is poor in quality and therefore sells for a low price, but it is the poor quality and not the fact that the cotton is untenderable which causes the price to be low.

QUALITY OF COTTON PRODUCED IN OKLAHOMA AND THE UNITED STATES

Grade

Table 3 and Figure III show the grades of cotton produced in Oklahoma and the United States in the years 1928 to 1932 together with an average

TABLE 3.—Grades of American Upland Cotton Produced in Oklahoma and the United States, 1928-1932 Crops

Year	Total all grades	Extra white	White middling and better	White strict low and low middling	White below low middling	Spotted and yellow tinged	All other grades
1000 Bales (Okla.)							
5-yr. av.	1,095.4	7.2	590.6	293.6	44.1	147.8	12.0
1928	1,187.0	0.1	755.6	197.4	73.0	114.0	46.9
1929	1,125.6	.0	442.9	503.2	38.7	129.5	11.3
1930	856.8	.0	485.2	270.8	4.3	96.3	0.2
1931	1,235.5	0.3	630.2	318.4	99.0	186.4	1.2
1932	1,071.9	35.6	639.2	178.4	5.5	212.9	0.3
(U. S.)							
5-yr. av.	14,359.3	454.3	9,673.5	2,227.5	314.4	1,602.7	87.3
1928	14,268.2	406.7	9,768.5	1,834.9	336.7	1,719.6	201.8
1929	14,519.0	468.7	9,179.8	2,687.1	370.2	1,707.2	106.0
1930	13,732.2	500.6	9,481.0	2,326.6	134.6	1,269.9	19.5
1931	16,582.1	435.3	12,062.8	2,388.4	560.4	1,071.2	64.0
1932	12,695.0	460.0	7,875.6	1,900.3	168.1	2,245.6	45.4
Percent of Total (Okla.)							
5-yr. av.	100	.7	53.9	26.8	4.0	13.5	1.1
1928	100	¹	63.7	16.6	6.1	9.6	4.0
1929	100	.0	39.4	44.7	3.4	11.5	1.0
1930	100	.0	56.6	31.6	0.5	11.2	0.1
1931	100	¹	51.0	25.8	8.0	15.1	0.1
1932	100	3.3	59.7	16.6	0.5	19.8	0.1
(U. S.)							
5-yr. av.	100	3.2	67.3	15.5	2.2	11.2	0.6
1928	100	2.8	68.5	12.9	2.3	12.1	1.4
1929	100	3.2	63.2	18.5	2.6	11.6	0.7
1930	100	3.6	69.2	16.9	1.0	9.2	0.1
1931	100	2.6	72.7	14.4	3.4	6.5	0.4
1932	100	3.6	62.0	15.0	1.3	17.7	0.4

¹Less than 0.05 percent.

Source: From Preliminary Reports on Grade, Staple Length, and Tenderability of Cotton Ginned in Oklahoma and the United States, 1928-1932, issued by U. S. D. A., Bureau of Agricultural Economics and Department of Agricultural Economics, Oklahoma A. & M. College.

for the period. The grades of cotton varied irregularly from year to year throughout the period, depending on the variations in the factors determining the various grades. However, for the five years an average of over one-half of the cotton ginned in Oklahoma and two-thirds of that ginned in the United States was white middling and better.

In 1932 a noticeable percentage of the cotton produced in Oklahoma graded extra white, but for the period as a whole less than one percent of the cotton produced in Oklahoma was extra white cotton in grade. During the same five years, 3.2 percent of the United States crop was extra white. In Oklahoma an average of 26.8 percent of the cotton produced was white, strict low and low middling while in the United States only 15.5 percent of the cotton was of these grades.

A higher percentage of the low grades of cotton was produced in Oklahoma for the five years studied than in the United States. An average of 18.6 percent of the Oklahoma cotton was below low middling in grade, including strict good ordinary, good ordinary, and all grades of spotted and yellow tinged, light yellow stained, yellow stained and blue stained, gray, and cotton of no grade. Fourteen percent of the United States cotton crop was included in these grades. In general a smaller proportion of the better grades of cotton and a larger proportion of the lower grades was produced in Oklahoma than in the United States, during this period.

Grades of Cotton Produced in Oklahoma and the United States
Average 1928-1932

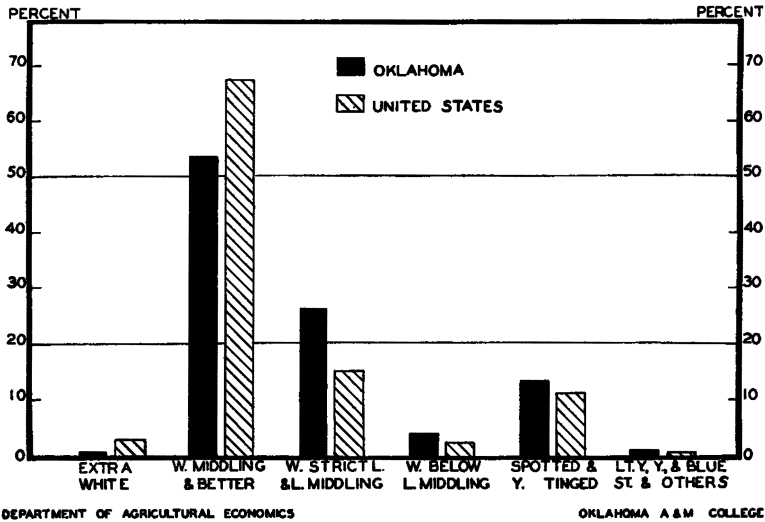


Figure III. During the past five years, Oklahoma has produced a somewhat smaller proportion of the better grades of cotton and a somewhat larger proportion of the poorer grades than the United States.

Staple Length

There was a noticeable decrease in the proportions of extra short cotton, that is, cotton having a staple length of less than 7/8 inch, produced in Oklahoma after 1929. The percentages of this length cotton decreased from 28.6 percent in 1929 to 8.0 percent in 1932. A decrease also was shown in the

proportion of cotton with a staple length of one inch and longer. In 1928, 17.5 percent of the cotton produced in Oklahoma was one inch and longer in staple length while in 1932 only 5.6 percent was of these lengths.

During the period studied there was an increase in the proportion of the cotton produced in the State which had a staple length of 7/8 and 29/32 inch. In 1928, 35.3 percent of the cotton produced was 7/8 and 29/32 inch in length, and in 1932, 50.2 percent of the cotton was of that length. The proportions of cotton with a staple length of 15/16 and 31/32 varied irregularly over the period; however, there was a higher percentage of this length cotton produced in 1932 than in any of the four preceding years.

TABLE 4.—Staple Lengths of American Upland Cotton Produced in Oklahoma and United States, 1928-1932 Crops
(Inches)

Year	All lengths	Under 7/8	7/8 and 29/32	15/16 and 31/32	1 and 1 1/32	1 1/16 and 1 3/32	1 1/8 and longer ¹
1000 Bales							
(Okla.)							
5-yr. av.	1,095.4	166.2	473.1	340.8	95.1	16.0	4.2
1928	1,187.0	161.4	421.9	396.3	172.1	25.4	9.9
1929	1,125.6	321.4	500.2	207.8	67.1	22.6	6.5
1930	856.8	126.7	348.6	295.1	71.6	12.2	2.6
1931	1,235.5	135.7	556.5	416.2	111.5	14.2	1.4
1932	1,071.9	85.7	538.3	388.4	53.2	5.7	0.6
(U. S.)							
5-yr. av.	14,359.3	1,832.2	5,628.4	3,517.3	1,873.7	930.3	677.4
1928	14,268.2	2,070.7	5,916.4	3,225.0	1,575.5	792.6	688.0
1929	14,519.0	2,920.5	5,535.7	2,748.9	1,693.0	937.4	683.5
1930	13,732.2	1,829.2	5,327.7	3,421.6	1,725.9	970.9	456.9
1931	16,582.1	1,014.5	6,580.8	4,515.0	2,551.1	1,077.0	843.7
1932	12,695.0	826.4	4,781.4	3,675.8	1,823.0	873.6	714.8
Percent of Total							
(Okla.)							
5-yr. av.	100	15.2	43.2	31.1	8.7	1.4	0.4
1928	100	13.6	35.5	33.4	14.5	2.2	0.8
1929	100	28.6	44.4	18.5	6.0	2.0	0.5
1930	100	14.8	40.7	34.4	8.4	1.4	0.3
1931	100	11.0	45.1	33.7	9.0	1.1	0.1
1932	100	8.0	50.2	36.2	5.0	0.5	0.1
(U. S.)							
5-yr. av.	100	12.1	39.2	24.5	13.0	6.5	4.7
1928	100	14.5	41.5	22.6	11.0	5.6	4.8
1929	100	20.1	38.1	18.9	11.7	6.5	4.7
1930	100	13.3	38.8	24.9	12.6	7.1	3.3
1931	100	6.1	39.7	27.2	15.4	6.5	5.1
1932	100	6.5	37.7	28.9	14.4	6.9	5.6

¹Includes length of 1 1/8 and 1 5/32; 1 3/15 and 1 7/32; 1 1/4 inch and longer.
Source: From Preliminary Reports on Grade and Staple Length, and Tenderability of Cotton Ginned in Oklahoma and the United States, 1928-1932, issued by U. S. D. A., Bureau of Agricultural Economics and Department of Agricultural Economics, Oklahoma A. & M. College.

Table 4 and Figure IV show the proportion of the various staple lengths of cotton produced in Oklahoma and the United States during the five-year period, 1928-1932. The figures in Table 4 show that a higher percentage of cotton under $7/8$ inch in length was produced in Oklahoma than in the United States during the period and also that Oklahoma produced a smaller percentage of cotton one inch and longer in staple length than was produced in the United States. An average of 15.2 percent of the cotton produced in Oklahoma from 1928 to 1932 was less than $7/8$ inch in length while

**Staple Lengths of Cotton Produced in Oklahoma and the United States
Average 1928-1932**

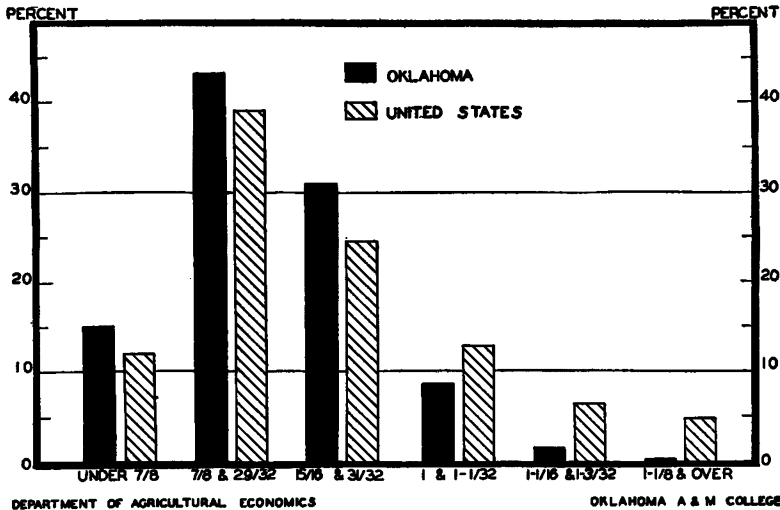


Figure IV. During the past five years Oklahoma has produced a larger proportion of cotton of short and medium staple length and a smaller proportion of the longer staple lengths than the United States.

12.1 percent of the cotton in the United States for the period was that short in length. Generally, there was a decrease in the proportion of extra short cotton produced during the period in both Oklahoma and the United States.

For the five years studied, an average of 74.3 percent of the cotton produced in Oklahoma was from $7/8$ to $31/32$ inch in staple length, while for the entire country 63.7 percent of the cotton was of these medium lengths. In Oklahoma there was an increase in the proportion of these staple lengths during the five years, while in the United States but little change occurred in the proportion of these lengths. An average of 10.5 percent of the cotton produced in Oklahoma during the period 1928 to 1932 was one inch and longer in staple length as compared with 24.2 percent for the United States for these longer staple lengths. During the period the proportion remained about constant for the United States but decreased in Oklahoma.

It seems probable that much of the variation in staple length for both Oklahoma and the United States during this period was the result of chance fluctuations in weather and other seasonal factors; changes in the kind of cotton grown and in the methods of handling it have probably been of some importance but may not prove permanent. The differences between Oklahoma and the United States probably are very largely the result of

different natural conditions. There is no reason to believe that Oklahoma could profitably attempt to produce as large a percentage of long staple cotton as is grown in other sections of the United States.

TABLE 5.—Distribution of the Grade and Staple Length of Oklahoma Cotton, Average 1929 to 1932 Crops

Grade	PERCENTAGE DISTRIBUTION OF STAPLE LENGTH (INCHES)						
	Total	Under 7/8	7/8 and 29/32	15/16 and 31/32	1 and 1 1/32	1 1/16 and 1 3/32	1 1/8 and longer
Total	100.0	15.6	45.2	30.5	7.1	1.3	0.3
Extra white	0.8		0.2	0.4	0.2		
White middling and better	51.2	5.6	20.8	18.5	5.1	1.0	0.2
Strict low middling and low middling	29.8	5.9	14.9	7.3	1.3	0.3	0.1
White below low middling	3.4	0.6	2.0	0.7	0.1		
Spotted and yellow tinged	14.5	3.3	7.2	3.6	0.4		
All other grades	0.3	0.2	0.1			0.0	0.0

¹Less than 0.05 percent.

Table 5 shows a combined distribution of the grade and staple length of Oklahoma cotton for the average of the four-year period 1929 to 1932. In this classification nearly two-thirds of the cotton appears in three of the classes while the remainder is widely scattered. White cotton, middling and better in grade, and 7/8 and 29/32 inch in staple length amounted to 20.8 percent of the total cotton production, and cotton of these grades that was 15/16 and 31/32 inch in staple length constituted 18.5 percent of the total. Strict low middling and low middling cotton that was 7/8 and 29/32 inch in staple length amounted to 14.9 percent of the total. During the four-year period, 15.6 percent of all the cotton was less than 7/8 inch in staple length. There was a tendency for a higher percent of the lower grades to be short in staple length than was true of the higher grades. For instance, only about 11 percent of the cotton that was white, middling and better in grade was less than 7/8 inch in staple length, while nearly 23 percent of the spotted and yellow tinged cotton was of that length.

Tenderability

Table 6 and Figure V show the tenderability of cotton produced in Oklahoma and the United States for the five years, 1928 to 1932, and an average for the period. Oklahoma produced a higher percentage of untenderable cotton in each of the five years than was produced in the United States. The data also show that there was a decrease in the proportion of untenderable cotton produced in both Oklahoma and the United States over the period. This decrease was especially noticeable in connection with cotton that was untenderable because of staple length. The amount of cotton untenderable because of grade fluctuated widely from year to year in Oklahoma and there was no clear trend either in Oklahoma or the United States.

An average of 22.3 percent of the cotton produced in Oklahoma for the period was untenderable on futures contracts, of which an average of 7.4 percent was untenderable in grade, 11.8 percent in staple length and 3.1 percent in both grade and staple. In the United States an average of 15.5

percent of the cotton produced was untenderable, of which 3.5 percent was untenderable in grade only, 10.7 percent in staple length only and 1.3 percent in both grade and staple length.

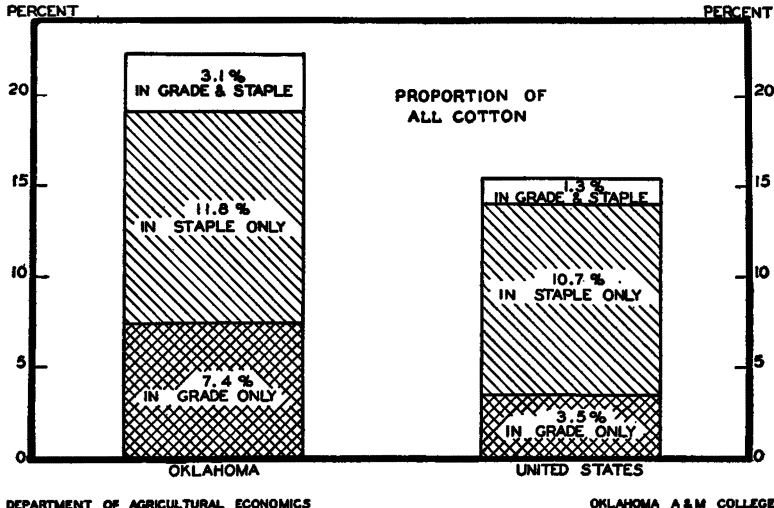
TABLE 6.—Tenderability of American Upland Cotton Ginned in Oklahoma and the United States, 1928-1932 Crops^a

Year	Total	Total tenderable	UNTENDERABLE			
			Total	In grade only	In staple only	In both grade and staple
1000 Bales (Okla.)						
5-year average	1,095.4	851.5	243.9	80.5	129.4	34.0
1928	1,187.0	915.5	271.5	124.1	102.5	44.9
1929	1,125.6	708.9	416.7	95.3	272.2	49.2
1930	856.8	700.2	156.6	29.9	115.0	11.7
1931	1,235.5	966.4	269.1	133.4	89.9	45.8
1932	1,071.9	966.2	105.7	20.0	67.3	18.4
(U. S.)						
5-year average	14,359.3	12,135.2	2,223.8	495.5	1,539.8	188.5
1928	14,268.2	11,724.2	2,544.0	492.9	1,787.2	263.9
1929	14,519.0	10,997.5	3,521.5	601.0	2,641.2	279.3
1930	13,732.2	11,623.2	2,109.0	279.8	1,737.7	91.5
1931	16,582.1	14,832.2	1,749.9	735.4	858.0	156.5
1932	12,695.0	11,500.3	1,194.7	368.3	675.3	151.1
Percent of Total (Okla.)						
5-year average	100	77.7	22.3	7.4	11.8	3.1
1928	100	77.1	22.9	10.5	8.6	3.8
1929	100	63.0	37.0	8.5	24.1	4.4
1930	100	81.7	18.3	3.5	13.4	1.4
1931	100	78.2	21.8	10.8	7.3	3.7
1932	100	90.1	9.9	1.9	6.3	1.7
(U. S.)						
5-year average	100	84.5	15.5	3.5	10.7	1.3
1928	100	82.2	17.8	3.5	12.5	1.8
1929	100	75.7	24.3	4.1	18.3	1.9
1930	100	84.6	15.4	2.0	12.7	0.7
1931	100	89.4	10.6	4.4	5.2	1.0
1932	100	90.6	9.4	2.9	5.3	1.2

^aTenderability according to Section 5 of the United States Cotton Futures Act.

Source: Compiled from Preliminary Reports on Grade, Staple Length and Tenderability of Cotton, issued by United States Department of Agriculture.

Untenderable Cotton Produced in Oklahoma and the United States
Average 1928-1932



DEPARTMENT OF AGRICULTURAL ECONOMICS

OKLAHOMA A & M COLLEGE

Figure V. During the past five years Oklahoma has produced a larger proportion of cotton that was untenderable on futures contracts than has the United States.

DIFFERENCES IN QUALITY OF COTTON PRODUCED IN DIFFERENT AREAS OF OKLAHOMA

Grade

Table 7 and Figure VI show the proportions of the various grades of cotton produced in Oklahoma by areas of the State for the years from 1928 to 1932, and an average for the period. The figure shows that a higher percentage of the better grades of cotton, that is, cotton grading white middling and better, was produced in the eastern areas of the State than in the western areas. The average percent of cotton grading white middling and better for the five years studied ranged from 33.3 percent in Area I, consisting of five counties in the west central part of the State, to 73.1 percent in Area 10, McCurtain county. (See Figure II.) In Areas 2, 3, 4, and 5, consisting of 23 counties west of and including Logan, Oklahoma, Cleveland, McClain, Grady, Stephens, and Jefferson counties, less than 60 percent of the cotton was white middling and better in grade, while in Areas 6, 7, 8, 9, 10, and 11 more than 60 percent of the cotton was of these better grades.

The percentage of cotton of the different grades varied irregularly from one year to the next in all areas of the State. There was a smaller percentage of cotton of the grades white middling and better produced in all areas of the State, with the exception of Area 9, in 1929 than in any of the other four years studied. The percentage of cotton coming in this classification dropped from 41.6 in 1928 to 17.2 in 1929 in Area 1, and from 75.8 to 43.2 in Area 10.

TABLE 7.—Grades of Cotton Produced in Oklahoma by Areas, 1928-1932

Areas and years	Total production (1000 bales)	PERCENT OF TOTAL PRODUCTION IN AREA					
		Extra White	White middling and better	White strict low and low middling	White below low middling	Spotted and yellow tinged	Other grades ¹
STATE							
Average	1,095.4	.7	53.8	26.9	4.0	13.5	.1
1928	1,187.0	.7	63.7	16.7	6.1	9.6	3.9
1929	1,125.6	.0	39.4	44.6	3.5	11.5	1.0
1930	856.8	.0	56.6	31.6	.5	11.3	.0
1931	1,235.9	.0	50.7	36.1	8.0	15.1	.1
1932	1,071.9	3.3	59.8	16.6	.5	19.8	.3
Area 1							
Average	176.3	1.1	33.3	36.2	4.7	21.3	3.4
1928	169.3	.0	41.6	17.1	10.6	15.8	14.9
1929	216.3	.0	17.2	58.7	3.8	18.2	2.1
1930	154.2	.0	33.2	46.5	1.5	18.8	.0
1931	177.6	.0	36.2	28.6	6.9	28.3	.3
1932	163.9	6.2	43.0	24.5	.9	25.2	.2
Area 2							
Average	62.1	1.0	58.3	23.2	3.7	12.9	.8
1928	67.1	.0	71.1	9.8	5.8	10.9	2.4
1929	64.0	.0	47.2	39.5	1.6	11.0	.7
1930	60.5	.0	55.5	28.7	.3	15.5	.0
1931	65.6	.0	54.1	24.5	9.3	11.9	.2
1932	53.2	5.5	63.3	13.5	.8	16.9	
Area 3							
Average	251.3	.9	47.4	32.7	2.1	15.8	.1
1928	263.7	.0	56.7	27.8	3.5	7.3	4.7
1929	285.6	.0	35.2	46.6	3.7	13.2	1.3
1930	149.5	.0	44.3	43.3	.4	12.0	.0
1931	257.3	.1	48.3	35.2	2.4	14.0	.3
1932	300.4	3.5	51.2	16.2	.1	29.0	.3
Area 4							
Average	153.3	.5	52.4	21.1	6.0	18.8	1.2
1928	206.9	.0	64.8	8.9	11.8	11.3	3.2
1929	153.9	.0	43.9	33.6	4.1	17.2	1.2
1930	116.5	.0	49.7	34.4	.4	15.5	.0
1931	161.5	.0	49.5	23.5	8.1	18.9	.0
1932	127.9	2.9	50.8	10.3	.8	35.2	.0
Area 5							
Average	81.1	.5	52.8	29.9	4.6	12.1	.1
1928	84.8	.0	74.7	11.7	6.2	7.0	.4
1929	89.2	.0	34.3	53.4	3.6	8.7	.0
1930	49.1	.0	48.8	32.7	.2	18.3	.0
1931	93.3	.0	44.0	29.2	10.7	16.0	.1
1932	89.2	2.0	61.1	23.0	.6	13.3	.0

(continued)

TABLE 7.—(continued)

Areas and years	Total production (1000 bales)	PERCENT OF TOTAL PRODUCTION IN AREA					
		Extra white	White middling and better	White strict low and low middling	White below low middling	Spotted and yellow tinged	Other grades ¹
Area 6							
Average	100.0	.2	64.1	23.5	4.1	7.8	.3
1928	109.3	.0	66.4	19.2	3.0	11.0	.4
1929	93.4	.0	56.8	37.1	3.1	2.9	.1
1930	103.5	.0	75.5	20.1	.1	4.1	.2
1931	140.4	.0	51.2	26.2	11.0	11.2	.4
1932	103.3	1.2	74.7	15.2	.4	8.5	.0
Area 7							
Average	96.9	.6	69.2	16.1	6.6	7.5	.0
1928	115.2	.0	80.7	8.8	4.0	6.3	.2
1929	82.8	.0	54.5	34.3	4.3	6.8	.1
1930	86.2	.0	72.2	21.6	.6	5.6	.0
1931	115.3	.0	54.9	13.0	19.8	5.2	.1
1932	85.1	3.4	84.0	7.1	.2	5.3	.0
Area 8							
Average	78.9	.2	70.6	20.1	3.0	6.0	.1
1928	83.6	.1	69.7	17.1	3.6	9.4	.1
1929	67.4	.0	56.4	39.1	1.8	1.7	1.0
1930	68.8	.0	86.3	12.1	.2	1.6	.0
1931	104.5	.0	62.2	19.7	7.2	10.9	.0
1932	70.2	1.4	80.9	14.5	1.1	2.1	.0
Area 9							
Average	40.2	.2	69.2	22.9	1.3	6.2	.2
1928	52.7	.0	75.0	16.1	.7	7.7	.5
1929	31.1	.0	71.7	25.4	.3	2.6	.0
1930	32.3	.0	71.3	21.3	.2	7.4	.0
1931	57.7	.0	60.3	28.8	2.4	8.3	.2
1932	37.0	.8	76.2	17.6	.3	5.1	.0
Area 10							
Average	18.5	.5	73.1	22.7	.5	3.2	.0
1928	20.7	.0	75.8	23.2	.5	.5	.0
1929	18.5	.0	43.2	54.6	.0	2.2	.0
1930	15.4	.0	94.2	3.9	.2	1.9	.0
1931	24.6	.0	83.4	14.2	.4	1.6	.4
1932	13.1	3.1	67.9	17.5	.2	11.5	.2
Area 11							
Average	26.9	.8	66.4	25.3	5.6	1.9	.0
1928	23.7	.0	81.0	11.0	5.5	2.5	.0
1929	23.4	.0	43.2	45.7	7.7	3.4	.0
1930	20.8	.0	73.1	26.4	.2	.5	.0
1931	38.1	.0	67.4	19.7	10.3	2.6	.0
1932	28.6	3.1	67.6	27.3	1.3	1.0	.2

¹Includes Light Yellow Stained, Yellow Stained and Blue Stained, Gray, and cotton of no grade.

²Less than 0.05 percent.

A noticeable amount of extra white was produced in the various areas of Oklahoma in 1932, particularly in the western areas. In Areas 1 and 2, 6.2 percent and 5.5 percent of the cotton was extra white in grade. In all other areas of the State in that year more than an average amount of the cotton was extra white.

Higher percentages of the low grades of cotton were produced in the western areas of the State than in the eastern areas during the five years. For example, an average of 29.4 percent and 26.0 percent of the cotton in Areas 1 and 4, respectively, was below white low middling in grade, which includes strict good ordinary, good ordinary, spotted, yellow tinged, light yellow, yellow and blue stained, gray and cotton of no grade. In Areas 9 and 10, only 7.7 percent and 3.7 percent, respectively, of the cotton produced was of these low grades. Generally, the western areas of the State also had a higher percentage of spotted and yellow tinged cotton than the eastern areas. The amount of this kind of cotton produced in the western part of the State increased during the period studied.

White Middling and Better Cotton Produced in Oklahoma by Areas
Average 1928-1932

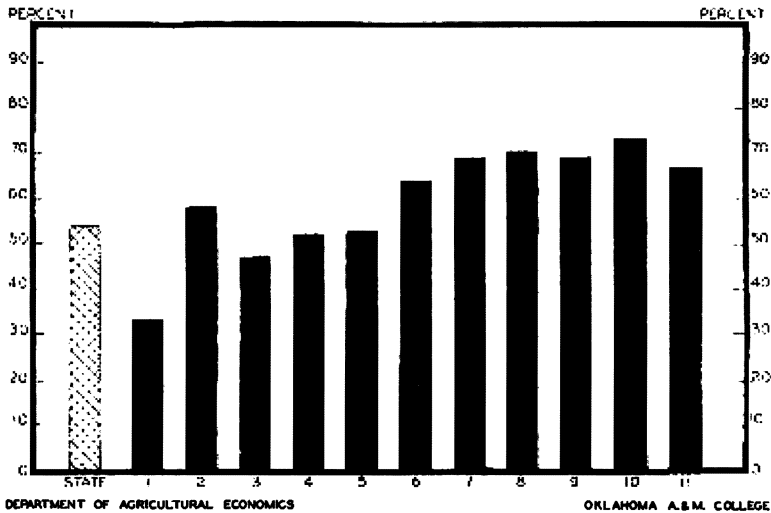


Figure VI. During the period 1928-1932 the eastern areas of Oklahoma have produced a larger proportion of the better grades of cotton than the western areas of the State. (See Figure II.)

Staple Length

Table 8 and Figure VII show the percentages of the several staple lengths of cotton produced in Oklahoma by areas of the State for the five years from 1928 to 1932, and an average for the period. Generally, cotton produced in the western and southwestern areas was shorter in staple length than that produced in the eastern areas of the State for each of the five years studied.

The average percentage of cotton with a staple of 29/32 inch and under in length ranged from 84.6 in Area 5 to 13.3 in Area 10 for the period. (See Figure II.) The average for the entire State was 58.3 percent. Areas 2, 4, 6, 7, 8, 9, and 10 produced less than the average percentage of cotton of

TABLE 8.—Staple Lengths of Cotton Produced in Oklahoma by Areas, 1928-1932

Areas and years	Total production (1000 bales)	PERCENT OF TOTAL PRODUCTION		
		29/32 and under	15/16 and 31/32	1 inch and longer
STATE				
Average	1,905.4	58.3	31.1	10.6
1928	1,187.0	49.2	33.4	17.4
1929	1,125.6	72.9	18.5	8.6
1930	856.8	55.5	34.4	10.1
1931	1,235.5	56.0	33.7	10.3
1932	1,071.9	58.2	36.2	5.8
Area 1				
Average	173.7	65.1	29.1	5.8
1928	165.9	59.0	31.4	9.6
1929	212.1	76.7	17.9	5.4
1930	152.1	59.0	37.0	4.0
1931	176.7	73.1	23.3	3.6
1932	161.6	53.6	40.2	6.2
Area 2				
Average	61.8	52.9	38.0	9.1
1928	66.6	47.4	40.7	11.9
1929	64.3	77.0	17.1	5.9
1930	59.8	51.7	43.8	4.5
1931	65.3	47.7	45.3	7.0
1932	53.1	38.8	44.6	16.6
Area 3				
Average	253.9	74.8	22.3	2.9
1928	265.9	67.7	25.8	6.5
1929	286.4	86.0	12.5	1.5
1930	153.2	79.8	18.3	1.9
1931	260.9	73.5	23.8	2.7
1932	302.8	69.0	29.2	1.8
Area 4				
Average	151.5	53.4	34.8	11.8
1928	204.3	46.7	36.6	16.7
1929	152.3	73.0	21.1	5.9
1930	116.1	54.1	34.7	11.2
1931	159.9	49.5	37.8	12.7
1932	124.8	45.1	45.0	9.9
Area 5				
Average	82.7	84.6	14.4	1.0
1928	85.9	80.6	17.3	2.1
1929	91.1	92.6	6.2	1.2
1930	51.1	90.4	9.2	.4
1931	93.9	84.6	14.8	.6
1932	90.0	77.4	22.1	.5

(continued)

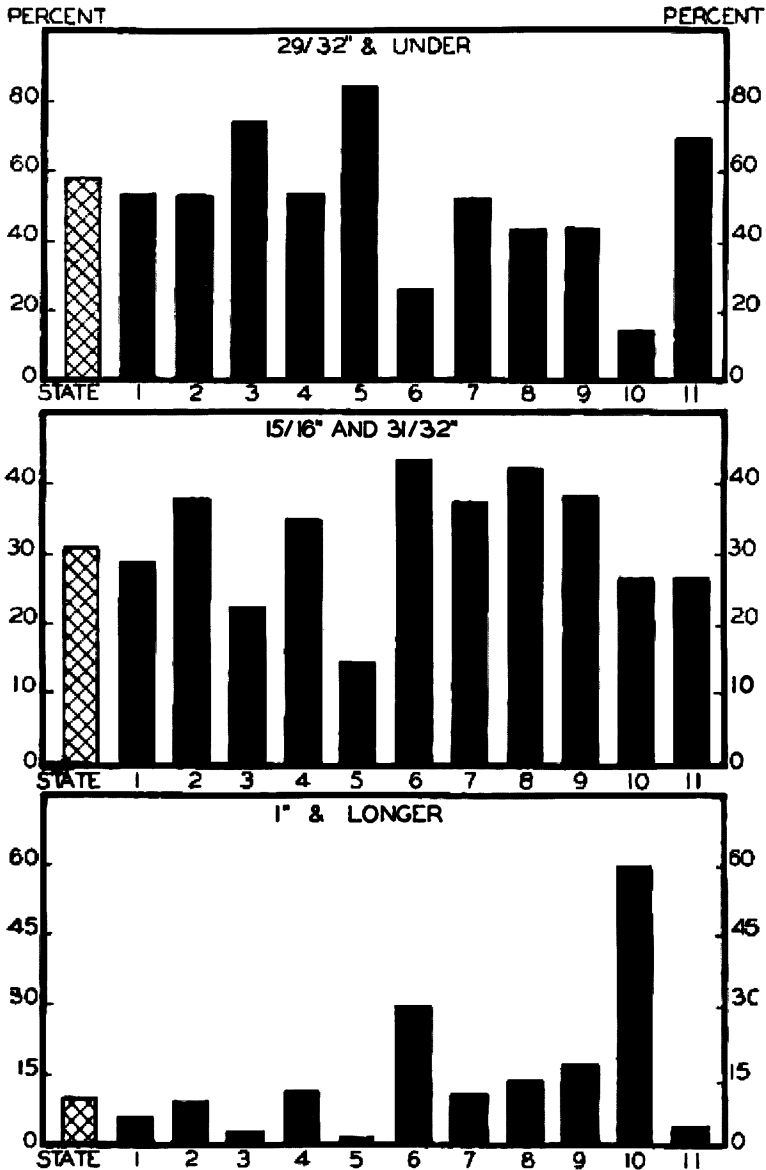
TABLE 8.—(continued)

Areas and years	Total production (1000 bales)	PERCENT OF TOTAL PRODUCTION		
		29/32 and under	15/16 and 31/32	1 inch and longer
Area 6				
Average	109.6	26.4	43.7	29.9
1928	110.6	9.6	40.0	50.4
1929	92.9	29.5	36.3	34.2
1930	103.0	22.9	47.4	29.7
1931	138.7	30.8	45.1	24.1
1932	102.8	38.9	49.0	12.1
Area 7				
Average	96.6	51.8	37.4	10.8
1928	115.4	39.5	38.3	22.2
1929	83.7	73.4	20.3	6.3
1930	84.2	56.5	38.5	5.0
1931	113.8	46.2	40.1	12.7
1932	85.7	50.6	46.9	2.5
Area 8				
Average	79.1	43.5	42.4	14.1
1928	84.2	25.1	48.9	26.0
1929	67.9	53.0	28.4	18.6
1930	68.3	34.6	52.3	13.1
1931	104.5	40.7	49.0	10.3
1932	70.9	69.1	29.3	1.6
Area 9				
Average	40.3	43.7	38.5	17.8
1928	42.9	31.0	44.3	24.7
1929	31.6	60.8	23.8	15.4
1930	31.7	39.8	40.7	19.5
1931	58.3	37.1	43.6	19.3
1932	37.2	57.3	34.9	7.8
Area 10				
Average	18.8	13.3	26.6	60.1
1928	21.3	8.5	22.0	69.5
1929	18.6	16.7	20.4	62.9
1930	16.0	6.2	23.8	70.0
1931	24.9	10.0	29.3	60.7
1932	12.9	31.8	38.0	30.2
Area 11				
Average	27.4	69.7	26.6	3.7
1928	24.0	71.7	22.5	5.8
1929	23.9	82.8	15.9	1.3
1930	21.2	71.2	27.8	1.0
1931	38.6	51.8	41.2	8.0
1932	29.2	80.5	19.5	1

¹Less than 0.05 percent.

this length, while Areas 1, 3, 5 and 11 produced more than the average percentage of such cotton.

Staple Lengths of Cotton in Oklahoma by Areas
Average 1928-1932



DEPARTMENT OF AGRICULTURAL ECONOMICS OKLAHOMA A&M COLLEGE

Figure VII. The western areas of Oklahoma produced a larger proportion of short staple and a smaller proportion of long staple cotton than the eastern areas during the period 1928-1932. (See Figure II.)

Generally, there was an increase in the proportion of short staple and a decrease in the proportion of long staple cotton in all areas of the State in 1929 over 1928; however, in the western areas of the State, particularly Areas 2, 3, 4, and 5, there was a gradual decrease in the proportions of that length of cotton from 1929 to 1932. In most instances, the percentages of cotton with a staple length of $29/32$ inch and shorter, produced in 1932, fell below the 1928 figure. In Areas 6, 8, and 10 there was an increase in the proportions of short cotton produced during the five years studied, and in all the eastern areas of the State a higher percentage of short cotton was produced in 1932 than in 1931. There was also a small decrease in the proportion of cotton $15/16$ and $31/32$ inch in length. The proportion of cotton one inch and longer in staple length declined from 10.3 percent in 1931 to 5.6 percent in 1932.

The average proportion of cotton with a staple length of $15/16$ and $31/32$ inch ranged from 14.4 percent in Area 5 in the southwestern part of the State to 43.7 percent in Area 6 in the northeastern group of cotton counties. The average for the State was 31.1 percent. Areas 1, 3, 5, 10, and 11, county groups along the southern, southwestern, and southeastern parts of the State, had less than the average percentage of these lengths of cotton, while areas 2, 4, 6, 7, 8, and 9, central and southeastern counties, had more than the average percentage. The proportion of the cotton which was of these lengths varied irregularly from year to year during the period without showing any marked trend upward or downward in any of the areas.

Practically no cotton with a staple length of $1\ 1/8$ inches and longer was produced in Oklahoma during the five years studied except in Area 10 which is made up of McCurtain county. An average of 9.0 percent of the cotton produced in this area was $1\ 1/8$ inches and longer in staple length. However, the proportion of this length cotton decreased from as high as 17.4 percent in 1928 to less than one percent in 1932. In 1929, 1930, and 1931, 12.4 percent, 1.9 percent, and 3.6 percent of the cotton produced in the area was $1\ 1/8$ inches and longer in length.

Tenderability

Table 9 and Figure VIII show the percentages of untenderable cotton produced in Oklahoma by areas of the State for each of the years from 1928 to 1932 and an average for the entire period. The proportion of untenderable cotton produced in Oklahoma for the period ranged from 20.9 percent in Area 5 to as low as 1.1 percent in Area 10. In Area 5, an average of 5.2 percent of the cotton produced was untenderable because of grade; 32.1 percent because of staple length and 3.6 percent because of both grade and staple length. In Area 10, .5 percent of the cotton was untenderable because of grade; .6 percent because of staple length and none because of both grade and staple length. In general the western part of the State had a larger percentage of untenderable cotton because of both grade and staple than did the eastern part of the State. In Areas 3, 5, 7, 9, 10, and 11 staple length was a more important cause of untenderability than was grade, while in Areas 1, 2, 4, 6, and 8 grade was the more important factor. In most of the areas with a high percentage of untenderable cotton a larger proportion of it was untenderable because of staple length than because of grade.

**TABLE 9.—Tenderability of Cotton Produced in Oklahoma:
by Areas, 1928-1932**

Areas	Production (1000 bales)	Percent tenderable	PERCENT OF TOTAL PRODUCTION UNTENDERABLE			
			Total	Because of grade	Because of staple	Because of both grade and staple
STATE						
Average	1,095.4	77.7	22.3	7.4	11.8	3.1
1928	1,187.0	77.1	22.9	10.5	8.6	3.8
1929	1,125.6	63.0	37.0	8.5	24.1	4.4
1930	856.8	81.7	18.3	3.5	13.4	1.4
1931	1,235.5	78.2	21.8	10.8	7.3	3.7
1932	1,071.9	90.1	9.9	1.9	6.3	1.7
Area 1						
Average	173.7	70.6	29.4	12.2	9.7	7.5
1928	165.9	57.4	42.6	22.8	6.4	13.4
1929	212.1	62.4	37.6	14.4	15.8	7.4
1930	152.1	78.7	21.3	8.3	10.2	2.8
1931	176.7	70.6	29.4	12.0	8.1	9.3
1932	161.6	87.3	12.7	2.4	6.1	4.2
Area 2						
Average	61.8	81.6	18.4	8.9	7.6	1.9
1928	66.6	78.1	21.9	12.3	7.0	2.6
1929	64.3	68.1	31.9	7.6	21.3	3.0
1930	59.8	86.1	13.9	7.7	5.2	1.0
1931	65.3	84.1	15.9	12.8	1.7	1.4
1932	53.1	94.2	5.8	2.8	1.3	1.7
Area 3						
Average	253.9	70.3	29.7	5.2	20.8	3.7
1928	265.9	75.2	24.8	6.4	14.0	4.4
1929	286.4	46.8	53.2	9.8	37.4	6.0
1930	153.2	65.3	34.7	2.9	29.0	2.8
1931	260.9	74.1	25.9	5.2	17.7	3.0
1932	302.8	87.5	12.5	1.1	9.5	1.9
Area 4						
Average	151.5	77.5	22.5	11.4	7.8	3.3
1928	204.3	73.3	26.7	17.8	5.4	3.5
1929	152.3	67.5	32.5	11.6	17.1	3.8
1930	116.1	82.3	17.7	3.8	12.7	1.2
1931	159.9	79.3	20.7	12.9	3.8	4.0
1932	124.8	89.8	10.2	6.2	1.0	3.0
Area 5						
Average	82.7	59.1	40.9	5.2	32.1	3.6
1928	85.9	58.3	41.7	9.3	31.0	1.4
1929	91.9	38.1	61.9	2.1	54.5	5.3
1930	51.1	55.2	44.8	2.0	41.7	1.1
1931	93.9	62.6	37.4	10.4	18.5	8.5
1932	90.9	79.8	20.2	.8	18.7	.7

(continued)

TABLE 9.—(continued)

Areas	Production (1000 bales)	Percent tenderable	PERCENT OF TOTAL PRODUCTION UNTENDERABLE			
			Total	Because of grade	Because of staple	Because of both grade and staple
Area 6						
Average	109.6	93.0	7.0	5.8	.8	.4
1928	110.6	95.0	5.0	4.5	.2	.3
1929	92.9	92.5	7.5	5.4	1.9	.2
1930	103.0	97.0	2.3	1.2	1.0	.1
1931	138.7	84.5	15.5	13.7	.5	1.3
1932	102.8	97.0	2.2	1.4	.6	.2
Area 7						
Average	96.6	83.8	16.2	7.4	7.8	1.0
1928	115.4	89.2	10.8	5.2	5.3	.3
1929	83.7	70.6	29.4	4.4	23.1	1.9
1930	84.2	88.0	12.0	1.1	10.6	.3
1931	113.8	74.2	25.8	21.8	1.4	2.6
1932	85.7	97.8	2.2	.5	1.7	0.0
Area 8						
Average	79.1	92.2	7.8	3.9	3.4	.5
1928	84.2	94.1	5.9	4.5	1.4	.2
1929	67.9	87.2	12.8	2.2	9.3	1.3
1930	68.3	97.7	2.3	.3	2.0	.3
1931	104.5	89.3	10.7	8.9	1.0	.8
1932	70.9	93.5	6.5	1.3	5.2	.2
Area 9						
Average	40.3	92.3	7.7	2.0	5.5	.2
1928	42.9	96.0	4.0	1.2	2.3	.5
1929	31.6	79.1	20.9	.6	20.0	.3
1930	31.7	92.1	7.9	.9	7.0	.3
1931	58.3	93.8	6.2	4.8	1.0	.4
1932	37.2	96.5	3.5	.3	3.2	0.0
Area 10						
Average	18.8	98.9	1.1	.5	.6	.2
1928	21.3	99.1	.9	.5	.4	0.0
1929	18.6	98.4	1.6	.3	1.6	.2
1930	16.0	100.0	0.0	0.0	0.0	0.0
1931	24.9	99.2	.8	.4	.4	0.0
1932	12.9	98.4	1.6	0.0	1.6	0.0
Area 11						
Average	27.4	81.4	18.6	5.5	12.0	1.1
1928	24.0	79.2	20.8	5.8	14.6	.4
1929	23.9	56.9	43.1	7.1	32.2	3.8
1930	12.2	97.7	12.3	1.0	11.3	.2
1932	38.6	87.0	13.0	9.9	2.3	.8
1932	29.2	91.1	8.9	.7	7.9	.3

¹Compiled from reports of the United States Department of Agriculture, Bureau of Agricultural Economics, Division of Cotton Marketing, Washington, D. C.

²Less than 0.05 percent.

Untenderable Cotton Produced in Oklahoma by Areas
Average 1928-1932

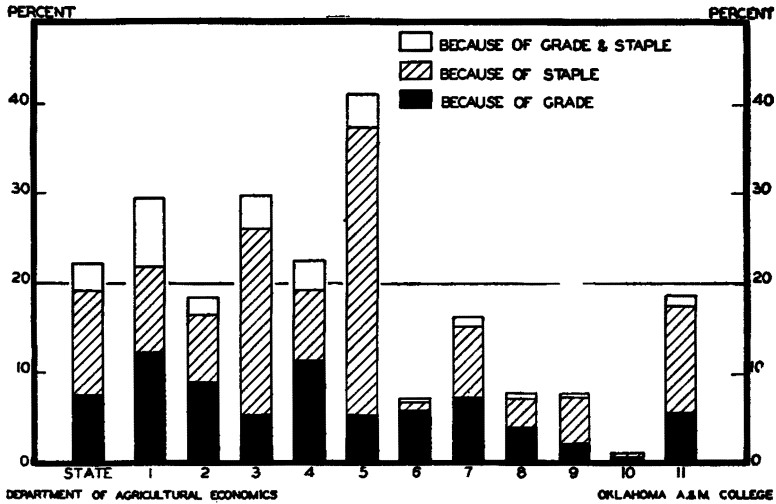


Figure VIII. The western areas of Oklahoma produce a larger proportion of cotton untenderable on futures contract than the eastern areas. (See Figure II for location of areas.)

QUALITY OF COTTON GINNED IN OKLAHOMA IN DIFFERENT PERIODS OF THE SEASON

Grade

Table 10 and Figure IX show the proportions of the various grades of cotton ginned during specified periods of the season in Oklahoma for the years 1928 to 1931, together with an average of the period. In general, higher percentages of the better grades of cotton were ginned during the early periods of the season than in the later periods. Weather damage to the cotton harvested late in the season is doubtless largely responsible for this.

For the four years, 1928 to 1931, an average of 577,500 bales or 52.4 percent of the cotton produced in Oklahoma was white middling and better in grade. Of this 577,500 bales, 39.5 percent was ginned prior to October first, 49.8 percent during October, 9.4 percent during November and 1.2 percent from December first to January 15. During the same period, an average of 323,200 bales or 29.3 percent of the cotton produced in the State was white, strict low and low middling, of which 9.0 percent was ginned prior to October 1, 33.5 percent during October, 39.1 percent during November, 17.0 percent from December first to January 15, and 1.4 percent after January 15.

Higher percentages of the low grades of cotton were ginned between December first and January 15 than in any period of the season for the four years from 1928 to 1931. During the period 1928 to 1931, an average of 53,800 bales or 4.9 percent of the cotton produced was white, below low middling, including strict good ordinary and good ordinary, of which less than one percent was ginned prior to October 1, 7.8 percent during October,

TABLE 10.—Grades of Cotton Ginned in Oklahoma During Specified Periods of the Season, 1928-1931¹

Grade	TOTAL GINNED		PERCENT EACH GRADE WAS OF TOTAL GINNINGS				
	1000 bales	Percent	Prior to Oct. 1	During Oct.	During Nov.	Dec. 1 to Jan. 1	After Jan. 15
All grades							
Average	1,101.3	100.0	24.5	38.9	22.0	12.4	2.2
1928	1,187.0	100.0	22.6	40.9	16.5	17.0	3.0
1929	1,125.6	100.0	22.7	49.9	22.7	12.9	1.8
1930	856.8	100.0	32.3	36.5	24.4	6.2	.6
1931	1,235.9	100.0	22.7	37.6	24.9	11.8	3.0
Extra White							
Average	.1	100.0	0.0	50.0	25.0	25.0	0.0
1928	.1	100.0	0.0	100.0	0.0	0.0	0.0
1929	0.0	--	--	--	--	--	--
1930	0.0	--	--	--	--	--	--
1931	.3	100.0	0.0	33.3	33.3	33.4	0.0
White Middling and Better							
Average	577.5	100.0	39.5	49.8	9.4	1.2	.1
1928	755.6	100.0	34.0	57.3	7.0	1.6	.1
1929	442.8	100.0	32.6	55.4	10.5	1.4	.1
1930	485.2	100.0	49.4	35.5	14.3	.7	.1
1931	626.4	100.0	34.4	47.9	7.7	.9	.1
White SL and LM							
Average	323.2	100.0	9.0	33.5	39.1	17.0	1.4
1928	197.4	100.0	1.3	13.7	40.6	41.5	2.9
1929	502.4	100.0	18.7	37.3	29.4	13.7	.9
1930	270.8	100.0	6.0	43.9	42.4	7.1	.6
1931	322.3	100.0	1.2	31.0	50.0	15.8	2.0
White Below LM							
Average	53.8	100.0	.7	7.8	42.2	44.1	5.2
1928	73.0	100.0	0.0	1.2	39.9	54.7	4.2
1929	38.9	100.0	4.6	8.5	60.7	20.6	5.6
1930	4.3	100.0	0.0	58.1	16.3	23.3	2.3
1931	98.8	100.0	0.0	10.1	37.9	46.0	6.0
Spotted and Yellow Tinged							
Average	131.8	100.0	9.3	21.1	28.9	33.1	7.6
1928	114.0	100.0	7.2	21.0	28.3	41.2	2.3
1929	129.9	100.0	11.5	10.5	27.5	42.3	8.2
1930	96.3	100.0	21.2	20.0	24.6	30.8	3.4
1931	186.8	100.0	2.9	29.2	32.6	22.6	12.7
Others							
Average	15.0	100.0	.2	1.3	4.7	48.7	45.3
1928	46.9	100.0	.2	1.1	3.2	45.2	50.3
1929	11.6	100.0	0.0	0.0	11.2	61.2	27.6
1930	.2	100.0	0.0	100.0	0.0	0.0	0.0
1931	1.3	100.0	0.0	15.4	0.0	61.5	23.1

¹Compiled from records of the United States Department of Agriculture, Bureau of Agricultural Economics, Division of Cotton Marketing, Washington, D. C.
²Less than 0.05 percent.

Grades of Cotton Ginned in Oklahoma During Periods of Season
Average 1928-1931

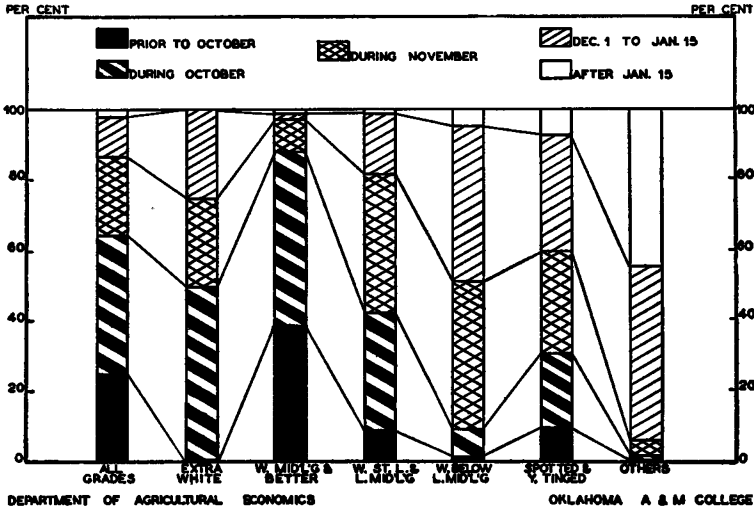


Figure IX. A larger proportion of the better grades of cotton is ginned early in the season than is true of the poorer grades.

42.2 percent during November, 44.1 percent from December 1 to January 15 and 5.2 percent after January 15.

During the same years, an average of 131,800 bales or 12.0 percent of the cotton produced in the State was spotted and yellow tinged in grade, of which 9.3 percent was ginned prior to October 1, 21.1 percent during October, 28.9 percent during November, 33.1 percent from December 1 to January 15, and 7.6 percent after January 15. Also during this period, an average of 15,000 bales or 1.4 percent of the cotton produced was light yellow, yellow and blue stained, gray and no grade. Ninety-four percent of the cotton of these grades was ginned after December 1.

Staple Length

Table 11 and Figure X show the proportions of the various staple lengths of cotton ginned in Oklahoma in different periods of the season for the four years, 1928 to 1931, together with an average of the period. Approximately 85.0 percent of the cotton one inch and longer in length was ginned prior to November 1, while only a little more than one-half of the cotton of extra short length was ginned during the same period. For instance, during the four years, 1928 to 1931, an average of 187,100 bales or 17.0 percent of the cotton produced in Oklahoma was less than 7/8 inches in staple length, of which 20.6 percent was ginned prior to October 1, 36.1 percent during October, 20.5 percent during November, 16.1 percent from December 1 to January 15, and 6.7 percent after January 15. During the same period, an average of 457,000 bales or 41.5 percent of the cotton produced in the State was 7/8 and 29/32 inches in length of which 18.5 percent was ginned prior to October 1, 36.7 percent during October, 26.7 percent during November, 16.2 percent from December 1 to January 15 and 2.1 percent after January 15.

TABLE 11.—Staple Lengths of Cotton Ginned in Oklahoma During Specified Periods of the Season, 1928-1931¹

Staple lengths and years	Total ginned (1000 bales)	PERCENT EACH STAPLE LENGTH WAS OF TOTAL GINNINGS					
		Percent	Prior to Oct. 1	During Oct.	During Nov.	Dec. to Jan. 15	After Jan. 15
All lengths							
Average	1,101.3	100.0	24.5	38.9	22.0	12.4	2.2
1928	1,187.0	100.0	22.6	40.8	16.5	17.0	2.1
1929	1,125.6	100.0	22.7	40.0	22.6	12.9	1.8
1930	856.8	100.0	32.3	36.5	24.4	6.2	.6
1931	1,235.9	100.0	22.7	37.6	24.9	11.8	3.0
Under 7/8							
Average	187.1	100.0	20.6	36.1	20.5	16.1	6.7
1928	162.3	100.0	21.2	32.8	5.2	25.1	15.7
1929	321.5	100.0	19.8	43.9	22.8	11.6	1.9
1930	126.7	100.0	38.9	22.3	26.0	10.7	2.1
1931	137.9	100.0	4.8	34.1	28.2	21.5	11.4
7/8 and 29/32							
Average	457.0	100.0	18.3	36.7	26.7	16.2	2.1
1928	421.7	100.0	17.1	35.6	19.9	25.7	1.7
1929	500.1	100.0	16.6	37.7	29.5	14.3	1.9
1930	348.6	100.0	30.2	33.5	28.1	7.7	.5
1931	557.4	100.0	13.4	38.7	28.5	16.0	3.4
15/16 and 31/32							
Average	328.2	100.0	28.9	41.6	20.4	8.3	.8
1928	395.5	100.0	22.2	46.9	18.9	11.2	.8
1929	207.9	100.0	33.4	37.5	13.5	13.6	2.0
1930	295.1	100.0	29.0	42.8	24.0	4.0	.2
1931	414.5	100.0	32.0	38.0	22.5	6.1	.5
1 and 1 1/32							
Average	105.4	100.0	39.3	44.3	12.1	4.1	.2
1928	172.3	100.0	32.6	48.0	14.7	4.7	0.0
1929	67.1	100.0	38.4	43.8	6.6	10.0	1.2
1930	71.6	100.0	59.2	50.2	9.2	1.3	.1
1931	110.8	100.0	50.1	35.2	13.5	1.2	0.0
1/16 and 1 3/32							
Average	18.5	100.0	47.6	42.7	8.1	1.6	0.0
1928	25.3	100.0	46.7	39.5	12.6	1.2	0.0
1929	22.6	100.0	42.5	49.1	4.4	4.0	0.0
1930	12.2	100.0	54.1	42.6	2.5	.8	0.0
1931	14.0	100.0	52.1	37.2	10.7	0.0	0.0
1 1/8 and longer							
Average	5.0	100.0	58.0	38.0	4.0	.2	0.0
1928	9.9	100.0	58.6	35.4	5.0	1.0	0.0
1929	6.4	100.0	56.2	42.2	1.6	0.0	0.0
1930	2.6	100.0	69.2	26.9	3.9	0.0	0.0
1931	1.3	100.0	46.2	38.4	7.7	7.7	0.0

¹Compiled from reports of the United States Department of Agriculture, Bureau of Agricultural Economics, Division of Cotton Marketing, Washington, D. C.²Less than 0.05 percent.

**Staple Length of Cotton Ginned in Oklahoma During Periods of Season
Average 1928-1931**

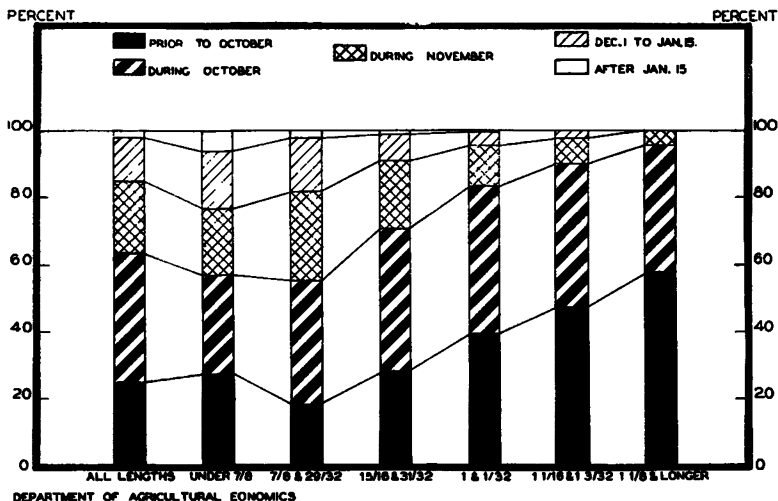


Figure X. A larger proportion of the longer staple lengths of cotton and a smaller proportion of shorter staple lengths are ginned early in the season than in the later part of the ginning season.

A higher percentage of the cotton of longer staple lengths was ginned earlier in the season. During this period an average of 328,200 bales or 29.8 percent of the cotton produced in Oklahoma was 15/16 and 31/32 inch in staple length, of which 28.9 percent was ginned prior to October 1, 41.6 percent during October, 20.4 percent during November, 8.3 percent from December 1 to January 15, and less than one percent after January 15. Nearly 84.0 percent of the cotton for the four years studied, with a staple length of 1 and 1 1/32 inches, was ginned prior to November 1. Ninety and three-tenths percent of the cotton with staple lengths of 1 1/16 and 1 3/32 inches was ginned prior to November 1, and 96.0 percent of the cotton with staple lengths of 1 1/8 inches and longer was ginned during the same period.

The proportions of the various staple lengths of cotton ginned during the specified periods of the season remained relatively constant during each of the four years studied. One reason why a larger proportion of the cotton of the longer staple lengths was ginned in the early part of the season is that most of the cotton of long staple type grown in Oklahoma is produced in the southeastern part of the State. In this region cotton is planted earlier than in the western areas, and, therefore, matures and is ready for harvesting earlier.

FACTORS AFFECTING THE QUALITY OF COTTON

Comparatively little information is available relative to the exact importance of various factors affecting the quality of cotton grown in the United States. However, it is generally understood that the inter-related influences of soil fertility, varieties of cotton grown, weather conditions such as rainfall and temperature, methods of harvesting and handling, and diseases and insect damage all directly, but to a varying degree, affect the quality of cotton produced. Comparatively little effort has been made to measure the degree of influence which each of these factors or combinations of factors have on the quality of cotton. Other factors which may affect the quality of cotton after it has matured and been harvested are the methods used in ginning and the conditions under which the cotton is ginned.

In some sections of the United States it has been shown that the more fertile soils produce a cotton of longer staple than is produced in sections of less fertile soils.⁵ However, in the eastern sections of Oklahoma, where the longer staple cottons are produced, the soils are generally considered to be somewhat poorer in fertility than in the western sections of the State where a large proportion of the cotton produced is 29/32 inch and under in staple length. For example, an average of the five years, 1928-1932, shows that 74.8 percent of the cotton produced in Area 3, in the western part of the State, was 29/32 inch and under in length, while in Area 9 only 43.7 percent of the cotton produced was of that length. Much of this difference is probably the result of differences in varieties of cotton grown, weather, and soil moisture conditions as well as differences in soil fertility. Diseases and insect damage at times apparently are important causes of low grades, particularly of spotted and yellow-tinged cotton. When the damaged bolls are harvested they spot or discolor the entire bale of cotton and lower its grade.

Varieties of Cotton Produced in Oklahoma

Table 12 shows the percentages of the different varieties of cotton grown in Oklahoma by areas of the State for each year from 1928 to 1931 as determined by field surveys. The major varieties of cotton grown in Oklahoma during the four years were Mebane, Half and Half, Acala and Oklahoma Triumph 44. These varieties constituted approximately three-fourths of the cotton grown in the State during the period. However, the proportions of these varieties decreased noticeably from one year to the next during the period, largely because of a marked reduction in the percentage of Half and Half cotton grown. Other varieties of cotton grown in Oklahoma which were of lesser importance were Russel, Delfos, Kasch, Rowden, Qualla and Cleitt. The percentages of cotton grown in the State from gin run seed or seed of no known variety were 9.0 in 1928, 8.7 in 1929, 9.6 in 1930 and as high as 13.8 in 1931.

In 1928, 80.3 percent of the cotton grown in Oklahoma was of the four major varieties, Mebane, Half and Half, Acala and Oklahoma Triumph 44, while in 1931 only 66.3 percent of the cotton was of these varieties. From 1928 to 1931 Mebane increased from 21.2 percent of the cotton grown to 29.4 percent, and Half and Half decreased from 37.2 percent to 10.6 percent.

⁵Youngblood, B., Relation of Soil Fertility to Quality of Cotton Produced, United States Department of Agriculture. Mimeographed release, p. 4, 5, and 8. Address given at meeting of Southern Agricultural Workers, Houston, Texas, February 6, 1929.

TABLE 12.—Varieties of Cotton Grown in Oklahoma in Different Areas of the State, 1928-1931 Crops

Variety and year	PERCENT EACH VARIETY WAS OF THE TOTAL COTTON CROP IN THE AREA											
	State	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8	Area 9	Area 10	Area 11
Half and Half												
1928	32.2	44.0	13.0	44.9	30.8	64.0	2.1	28.6	7.8	10.8	12.0	29.5
1929	31.6	39.5	17.0	45.4	27.9	61.2	2.3	24.2	6.3	11.8	11.4	32.1
1930	23.0	33.0	14.2	38.3	21.1	48.0	2.4	19.4	4.4	12.8	7.9	22.5
1931	10.6	19.3	4.2	11.4	9.1	21.5	1.8	17.2	2.2	4.2	2	2.6
Mebane												
1928	21.2	19.4	24.8	23.3	16.4	17.5	28.6	23.4	18.1	11.1	12.5	38.4
1929	20.9	19.6	24.7	21.0	15.6	17.4	28.5	25.9	20.4	12.1	11.6	37.4
1930	22.6	21.9	26.6	22.5	15.8	21.1	27.2	25.1	23.2	11.7	10.0	44.8
1931	29.4	26.9	26.7	33.1	24.1	32.6	28.6	27.8	27.3	13.2	2	63.3
Acala												
1928	18.9	21.0	35.8	13.5	40.4	6.8	16.4	17.2	9.4	10.0	2.8	1.8
1929	18.5	20.7	34.3	12.7	40.6	7.4	16.4	19.0	11.1	9.7	1.2	.7
1930	19.9	21.8	35.6	12.4	41.8	7.7	17.2	20.0	14.8	11.1	.5	.7
1931	18.2	26.4	40.4	12.6	15.8	13.2	16.5	23.5	12.2	14.8	2	1.0
Okla. 44												
1928	8.0	1.8	12.4	.8	6.0	1.9	21.7	6.7	39.2	6.2	1.2	4.3
1929	8.4	3.5	9.7	.9	8.6	2.9	23.6	8.7	37.6	5.2	1.7	4.4
1930	10.4	4.1	8.7	1.8	12.1	4.7	23.7	8.8	33.4	6.2	3.6	4.5
1931	8.1	5.0	7.0	.9	31.3	5.0	14.6	3.8	24.2	5.4	2	6.2
Kasch												
1928	2.1	1.0	.9	4.8	.6	2.7	2.4	.5	.5	.3	0.0	1.9
1929	2.4	1.0	.8	6.2	.7	3.6	1.6	.4	.5	.2	0.0	.7
1930	2.2	1.1	1.1	6.2	.9	6.7	1.4	.4	.7	.3	0.0	.8
1931	3.5	1.2	1.2	8.1	10.3	9.3	2.5	.2	.4	0.0	2	1.4
Delfos												
1928	2.9	.1	0.0	.2	1.3	.3	3.3	3.6	6.8	16.3	54.4	.3
1929	2.6	.02	0.0	.1	1.0	.3	2.8	2.8	5.6	17.0	55.6	.4
1930	3.0	0.0	.2	.2	.9	.3	2.5	3.0	4.2	19.2	58.0	.6
1931	2.4	0.0	0.0	.1	0.0	.1	3.2	1.3	6.5	16.4	2	.7

(Continued)

TABLE 12.—(continued)

Variety and year	PERCENT EACH VARIETY WAS OF THE TOTAL COTTON CROP IN THE AREA											
	State	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8	Area 9	Area 10	Area 11
Rowden												
1928	1.2	.2	.4	.4	.2	.5	1.3	1.7	3.2	8.5	4.8	1.3
1929	1.1	.1	.9	.4	.3	.4	1.4	1.3	3.3	9.7	4.2	1.5
1930	1.5	.4	.3	.4	.6	.4	2.1	1.0	4.3	9.7	4.2	1.3
1931	2.8	1.0	.5	.6	0.0	.7	3.9	1.4	7.9	13.2	2	1.9
Russell												
1928	1.4	3.4	.8	2.3	.1	.4	.3	2.3	.2	0.0	1.2	.8
1929	1.8	4.6	1.0	3.0	.1	.2	.1	2.1	.2	0.0	1.2	.3
1930	1.8	5.4	1.0	3.1	.1	.4	0.0	1.3	.3	0.0	1.1	.1
1931	1.5	2.1	.8	4.0	1.4	1.1	0.0	1.2	0.0	0.0	2	2.3
Cleitt												
1928	.5	0.0	0.0	1.5	.5	.9	0.0	0.0	0.0	0.0	0.0	0.0
1929	.8	0.0	0.0	2.4	.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0
1930	1.2	0.0	0.0	5.0	.5	2.8	0.0	0.0	.2	0.0	0.0	0.0
1931	2.8	0.0	0.0	11.5	--	5.2	0.0	0.0	0.0	0.0	2	0.0
Qualla												
1928	.6	1.6	0.0	.6	.3	0.0	0.0	.3	.5	1.4	0.0	1.7
1929	.7	1.4	0.0	.7	.7	.1	0.0	.2	.6	1.5	.2	1.6
1930	1.0	2.2	.4	1.3	.9	.5	0.0	.5	.5	1.3	.7	2.1
1931	2.1	4.1	1.2	4.0	1.7	.5	0.0	.7	1.1	2.2	2	5.7
All others¹												
1928	2.0	2.1	.9	3.3	.4	.4	.8	3.3	3.0	3.6	2.3	1.6
1929	2.5	3.2	2.3	3.6	.6	.4	1.0	3.6	3.7	2.4	2.1	2.5
1930	3.8	4.3	4.2	4.7	1.4	.8	1.2	6.8	6.1	.9	3.7	3.2
1931	4.8	5.4	9.8	6.7	.4	.1	2.0	7.5	5.2	0.0	2	3.6
No variety⁴												
1928	9.0	5.4	11.1	4.4	3.0	4.6	23.1	11.5	11.3	31.8	8.6	18.4
1929	8.7	6.4	9.2	3.6	3.6	4.9	22.3	11.8	10.7	31.2	10.8	18.4
1930	9.6	5.8	7.7	4.1	3.9	6.6	22.3	13.5	8.1	26.8	10.3	14.4
1931	13.8	8.6	8.2	7.0	5.9	10.7	26.9	15.0	13.0	30.0	2	11.3

¹Prepared from data secured from field surveys conducted in connection with the estimation of the grade and staple length of Oklahoma cotton and tabulated by Mr. R. T. Baggett and other members of the Division of Cotton Marketing, Bureau of Agricultural Economics, United States Department of Agriculture, (Dallas Office.)

²No reports.

³Includes varieties of which only small amounts were grown, such as Lone Star, Delta Pine, Bennett, Early Webber, Big Four, Paris Big Boll, Conrod, Texas Special, Harts Long Staple and others.

⁴Includes gin run and run out varieties.

During this period Acala and Oklahoma Triumph 44 remained about constant in relative importance, decreasing from 18.9 percent to 18.2 percent of the cotton grown and increasing from 8.0 percent to 8.1 percent respectively. There were small increases in the proportions of some of the less common varieties such as Rowden, Kasch, Qualla and Cleitts.

The figures in Table 12 show that in Areas 1, 2, 3, 4, 5, and 7, (roughly the western half of the cotton-producing counties) Half and Half, Mebane and Acala were the leading varieties of cotton grown. These three varieties made up approximately three-fourths of the cotton grown in these areas for the four years 1928 to 1931. In Area 1, Half and Half ranked first in 1928, 1929 and 1930, and third in 1931. In Area 2, Acala was the most common variety for all four years, Mebane second in importance and Half and Half third, except in 1931. In Areas 3 and 5, Half and Half was the most common variety for the first three years of the period, Mebane taking first rank in 1931 in both areas.

In Areas 5 and 8 the leading varieties were Mebane, Oklahoma Triumph 44, and Acala for the four years from 1928 to 1931. In Area 6 Mebane was the most common variety, while in Area 8 Oklahoma Triumph 44 ranked first except in 1931 when slightly more Mebane was grown. In Areas 9 and 10, Delfos, Mebane and Half and Half were the leading varieties for the four years. In both areas Delfos was the most important for the period. Mebane was second and Half and Half third in importance in both areas in 1928 and 1929. In Area 11 Mebane was the most important variety grown in each of the four years studied; Half and Half and Oklahoma Triumph 44 were the other varieties of most importance.

Snapped Cotton

The method of harvesting cotton by hand-picking the seed cotton from the burr, and leaving the burr on the stalk, has been the standard method of harvesting used in this and other cotton-growing countries as far back as the beginning of cotton production. Another method has become popular in the newer cotton-producing areas of this country, particularly in western Texas and Oklahoma. This method is commonly known as harvesting by "snapping." When this is done the burr holding the cotton is removed from the stalk and taken to the gin with the seed cotton. Snapping was originally used to remove from the stalks immature and damaged bolls from which cotton is extracted with great difficulty and to save the "tag ends" of the crop. However, at present it is used extensively in the western areas of Oklahoma and Texas to harvest large proportions of the mature cotton especially when picking costs are relatively high and the price is relatively low. The harvesting of cotton by snapping may perhaps prove to be the first step toward mechanical harvesting. It has become more important with large-scale farming in areas where labor for harvesting is relatively scarce. Snapping is a much faster and cheaper method of harvesting than hand-picking. It is estimated that one man on an average can snap approximately enough seed cotton in a day to yield 111 pounds of lint, while he can hand-pick in the same time only enough to yield about 75 pounds.⁹

Figure XI and Table 13 show the proportions of seed cotton harvested by snapping in Oklahoma by counties during the eight years from 1924 to 1931. The graph in the lower left hand corner of Figure XI shows the total amount of cotton harvested, the total amount of cotton snapped and the proportions of snapped cotton in the State during the eight years. While the percentage of cotton harvested in Oklahoma by snapping varied irregularly during the eight years studied, there was some increase in the

⁹Brodell, A. P., and Cooper, M. R., Requirements and Costs for Picking, Snapping and Sheddling Cotton in Western Texas and Oklahoma. United States Department of Agriculture Report, p. 4.

Cotton Harvested by Snapping in Oklahoma Average 1924-1931

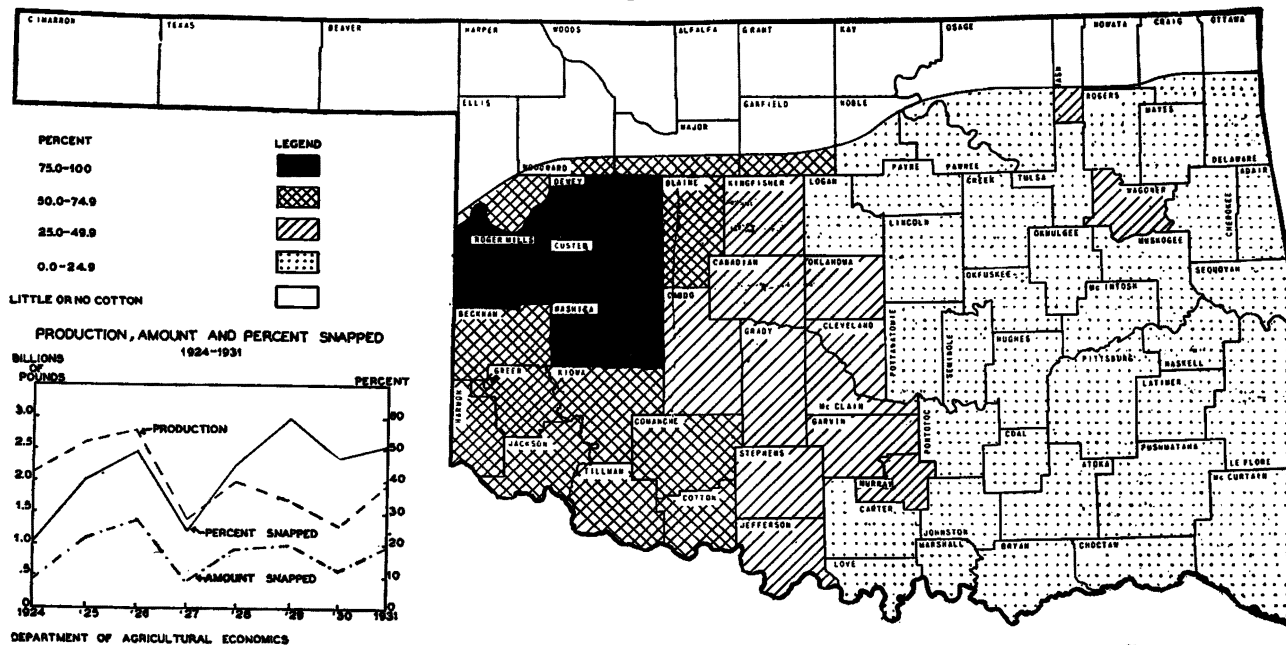


Figure XI. A much larger proportion of the cotton crop is harvested by snapping in western Oklahoma than in eastern Oklahoma.

TABLE 13.—Percentages of All Cotton Produced in Oklahoma that Was Harvested by Snapping, by Areas, 1924-1931

Area	PERCENTAGES									Percent annual decrease or increase ¹
	Average	1924	1925	1926	1927	1928	1929	1930	1931	
STATE	42.6	20.4	40.1	49.2	24.6	45.1	59.4	47.2	51.1	+3.59
1	75.8	48.0	84.5	76.7	53.1	76.0	83.9	82.9	85.9	+3.59
2	34.1	22.9	39.3	43.8	16.2	21.0	35.5	30.8	46.1	+1.19
3	65.8	32.2	78.8	71.5	24.8	79.4	85.6	85.7	84.9	+5.96
4	40.5	28.2	47.0	54.2	23.0	37.3	44.1	39.6	40.7	+ .41
5	51.4	24.2	65.2	57.1	20.6	43.6	69.2	72.4	60.7	+4.18
6	17.1	12.7	18.1	26.0	10.1	15.6	17.0	6.3	19.0	- .43
7	16.7	4.9	20.7	26.1	5.2	10.2	17.9	8.3	25.4	+ .74
8	10.0	2.2	11.8	15.2	1.4	8.0	13.2	1.7	18.5	+ .76
9	5.0	2.1	8.7	11.2	.1	2.0	1.1	0.0	.7	- .97
10	.9	0.0	3.1	3.0	0.0	0.0	0.0	0.0	0.0	0.0 ²
11	14.9	3.0	27.9	26.1	9.8	8.9	13.2	2.5	11.7	-1.26

¹Calculated by method of least squares.²Decrease apparent.

percentage of cotton harvested in this manner in the State from 1924 to 1931. In 1924, 20.2 percent of the cotton produced was snapped and in 1931, 51.1 percent of the cotton was harvested in that manner. During the period there was an average annual increase of 3.59 percent in cotton harvested by snapping.

Harvesting by snapping is practiced more in the western areas of the State than in the eastern areas. Table 13 shows that for the eight-year period from 1924 to 1931 the average percentage of cotton harvested by snapping ranged from 75.8 in Area 1 (five west central cotton counties) to less than one percent in Area 10 (McCurtain county). The table also shows the average annual percent of increase or decrease which took place in the various areas of the State during the period. There was an increase in the proportions of cotton snapped during the eight years in all areas of the State except Areas 6, 9, 10, and 11 (areas in the eastern and southeastern part of the State). The largest increase occurred in Areas 1, 3, and 5.

In Area 6, 9, and 11, all of which are located in the eastern part of the State, the average annual percentage decreases in cotton harvested by snapping were .43, .97 and 1.26 for the respective areas. In these areas in which a decrease occurred a relatively small percentage of the cotton produced was harvested by snapping.

It is commonly believed that factors such as types of farming, amount produced per farm, size of crop produced, prices paid for cotton, rainfall during harvesting season and varieties grown influence to a large degree the proportions of cotton harvested by snapping in different parts of the State. Table 14 and Figure XII show the average number of acres per farm in cotton and the percentage of cotton snapped in Oklahoma by areas of the State for the 1929 crop.

In the western areas of Oklahoma, where large-scale farming was more commonly practiced and the cotton acreage per farm was large, a much higher percentage of the cotton was harvested by snapping than in areas in the eastern part of the State where the cotton acreage per farm was smaller. In western areas, particularly, the harvesting of the cotton crop is one of the major problems in cotton production. One family can cultivate more cotton than it can gather. It must depend on outside labor for the harvesting of a large proportion of the crop. It is frequently difficult to secure sufficient outside labor to pick the cotton before it is subjected to adverse weather conditions. This circumstance greatly encourages the snapping of cotton as snapping is much faster than hand-picking.

Table 15 and Figure XIII show the relationship between the proportion of cotton harvested by snapping, the production, and prices paid for cotton in Oklahoma for each of the eight years from 1924 to 1931. During years of heavy production and low prices more cotton was snapped than in years of relatively low production and high prices. In 1925, with a combination of an increased production over 1924 and a low farm price, the proportion of cotton harvested by snapping increased. In 1926, with a further increase in production and decrease in price, the proportions of snapped cotton continued to increase. In 1927, production fell below that of the preceding year, the price of cotton rose and the proportions of snapped cotton decreased. Again in 1928 there was an increase in production over the preceding year, a decrease in price and an increase in the proportions of snapped cotton. However, in 1929 production and prices both fell and the proportion of snapped cotton increased, and in 1930 there was a decrease in all three factors. This irregularity was due in part to abnormal business and agricultural conditions, the price and harvesting costs having more influence than production on the snapping of cotton. But again in 1931 an increased production over the preceding year and a decreased price was accompanied by an increase in the proportions of cotton snapped.

TABLE 14.—Relationship Between the Acreage of Cotton per Farm and the Percent of Cotton Harvested by Snapping in Oklahoma in 1929¹

Areas	Number farms reporting cotton	Total cotton acreage	Average cotton acreage per farm	Percent of cotton harvested by snapping
STATE	123,477	4,148,228	33.6	59.4
1	12,316	598,395	48.6	83.9
2	7,439	204,730	27.5	35.5
3	12,477	993,959	79.7	85.6
4	13,692	521,937	38.1	44.1
5	8,352	357,363	42.7	69.2
6	17,652	387,159	21.9	17.0
7	16,321	362,202	22.2	17.9
8	15,147	335,064	22.1	13.2
9	9,813	168,436	17.2	1.1
10	3,677	77,943	21.2	0.0
11	5,025	118,223	23.5	13.2

¹Fifteenth Census of the United States, 1930, Oklahoma, First Series, pp. 38-39.

**Cotton Acreage per Farm and Percent of Cotton Snapped in Oklahoma
By Areas, 1929 Crop**

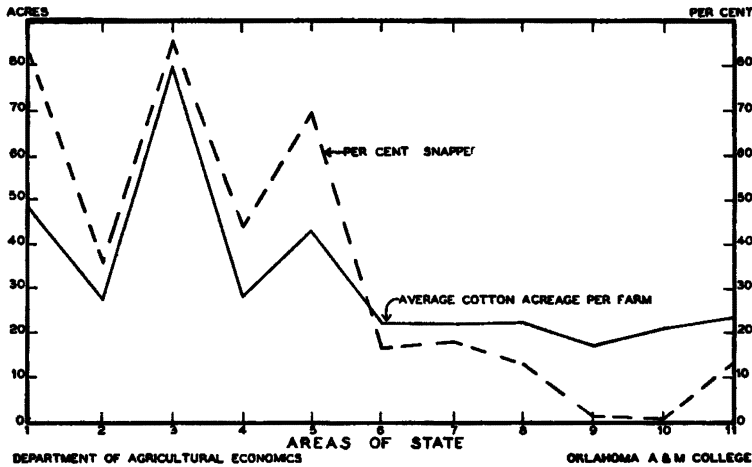


Figure XII. In areas where the average acreage per farm in cotton is large, the percent of cotton harvested by snapping is usually large and in areas where the acreage is low comparatively little cotton is harvested by snapping. (See Figure II for location of areas.)

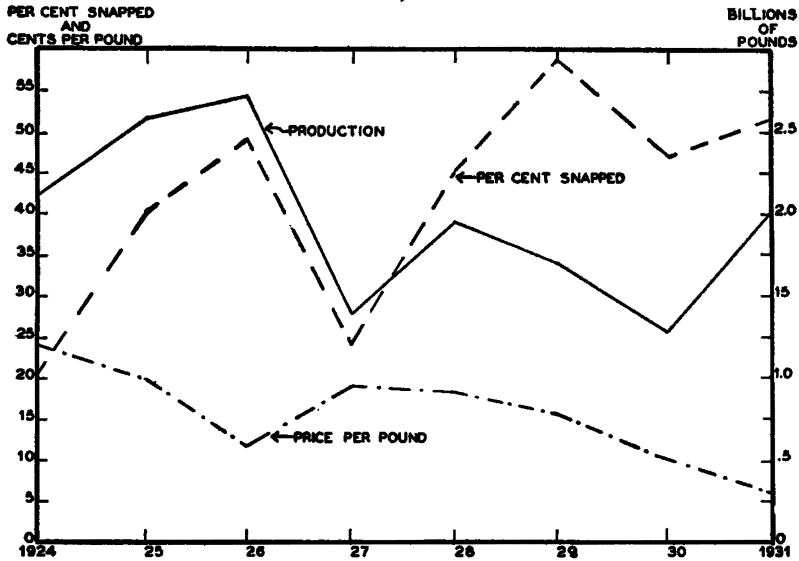
TABLE 15.—Cotton Harvested by Snapping and the Annual Average Price Per Pound Paid for Cotton in Oklahoma for Eight Years, 1924-1931

Year	Seed cotton harvested (millions of pounds) ¹	Snapped cotton (millions of pounds) ¹	Percent snapped	Average price paid per pound (cents) ²
8-year average	1,997	851	42.6	15.6
1924	2,134	434	20.4	23.5
1925	2,623	1,103	40.1	20.3
1926	2,779	1,366	49.2	12.2
1927	1,482	363	24.5	19.0
1928	1,953	881	45.1	17.6
1929	1,729	1,028	59.4	16.6
1930	1,341	633	47.2	9.7
1931	1,958	997	51.1	5.7

¹Total pounds listed on individual gin reports of Oklahoma State Corporation Commission, Cotton Department.

²Ellis, L. S., Oklahoma Current Farm Economics, Series 49, Vol. 6, page 19.

**Cotton Production, Price per Pound, and Percent Snapped
Oklahoma, 1924-1931**



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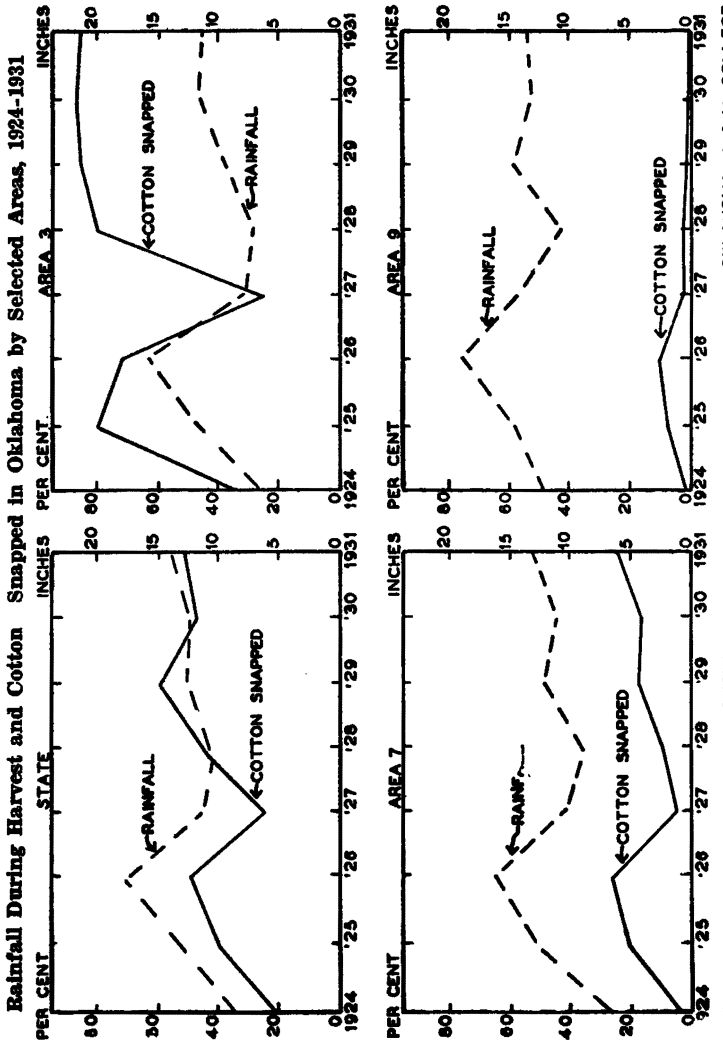
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Figure XIII. In years when the amount of cotton produced in Oklahoma is large and the price is low a larger proportion of the crop is harvested by snapping than in other years.

Figure XIV shows the relationship between the rainfall during the harvesting season¹⁰ and the proportions of cotton harvested by snapping in the State for the eight years, 1924 to 1931. Generally, in the years in

¹⁰Tables 2 and 3 of the Appendix contains data showing the rainfall in different sections of Oklahoma during the period studied.

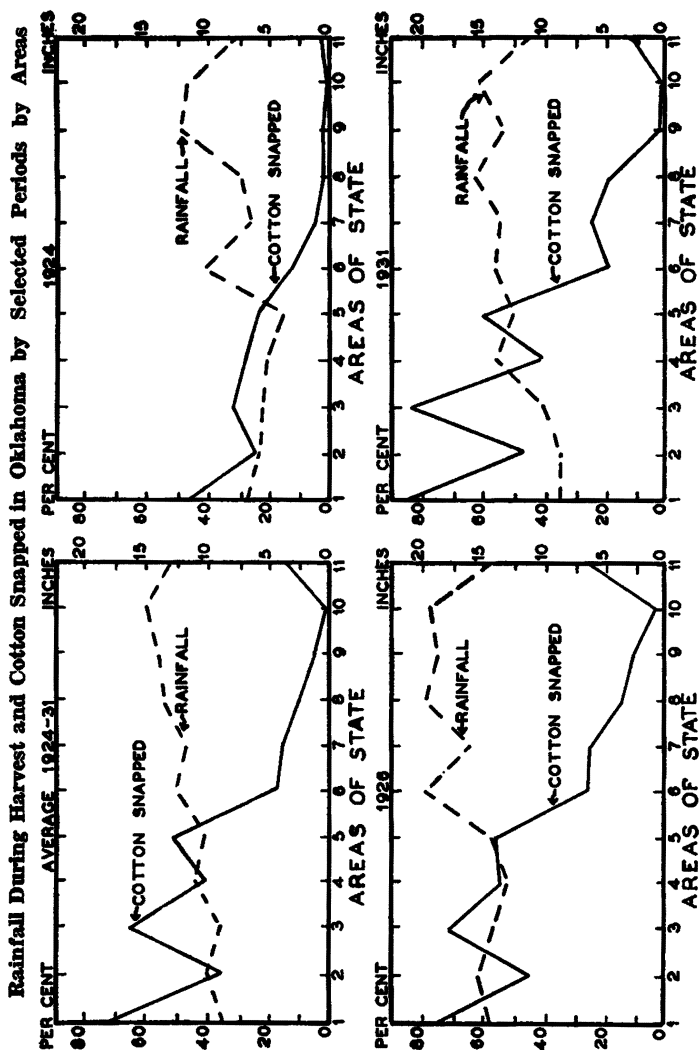
which rainfall was heavy, during the months of September, October, November, and December, larger proportions of the cotton were harvested by snapping than in years when the rainfall was light. For example, in 1924 the average rainfall in Oklahoma during the harvest months was 7.56 inches and the percentage of snapped cotton was 20.4. In 1925, the rainfall was 12.10 inches and the percentage of snapped cotton 40.1, and in 1926 the rainfall during harvest season was 16.93 inches and the percentage of snapped cotton 49.2. In 1927 the rainfall was much lighter than in 1926. There was a corresponding decrease in the percent of cotton snapped. In 1929, 1930,



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 Figure XIV. A larger proportion of the cotton crop is harvested by snapping in years when the rainfall during harvest is heavier than in other years.

and 1931 a change in rainfall from one year to the next was accompanied by a corresponding change in the proportions of snapped cotton.

Figure XIV also shows the relationship between the percent of snapped cotton and rainfall during the harvesting season in three areas of the State for the eight years studied. Area 3 is in the western section of the State where a large proportion of the cotton is harvested by snapping. Area 7 is in the central part of the State where a smaller percentage of the cotton is harvested by snapping, and Area 9 is in the eastern part of the State where practically no cotton is harvested by snapping. Generally, from one year to



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 Figure XV. A larger proportion of the cotton crop is harvested by snapping in areas where the rainfall during harvest is light than in areas where it is heavy. (See Figure II for location of areas.)

the next in these areas, with an increase in the amount of rainfall there was an increase in the percentage of cotton snapped, and with a decrease in rainfall there was a decrease in the percentage of cotton harvested by snapping.

Adverse weather conditions during the fall months slow down the harvesting of cotton. Frequently large quantities of the crop open in the field before it can be harvested. The farmers, wishing to gather their crop as fast as possible, before weather damages increase, resort to snapping as soon as conditions permit. However, Figure XV shows that when different areas of the State are compared, there was an inverse relationship between the proportions of cotton snapped in each area and the amount of rainfall in that area during harvest; that is, in the areas of the State where rainfall was heavy the proportions of cotton snapped were smaller than in the areas where rainfall was light. This variation may be due in part to differences in such conditions as types of farming, size of farms, amount of harvesting labor locally available, and varieties of cotton grown.

It is also true that the amount of rainfall during the growing season apparently determines to some extent the amount of cotton that is harvested by snapping. If rainfall is insufficient during the growing months the cotton bolls do not mature properly. They are frequently too small to hand-pick conveniently. Consequently, it is necessary to snap the cotton. These conditions frequently occur in the western part of the State. Early frost in this part of the State also sometimes increases the amount of snapped cotton. When large amounts of the late set bolls are frost damaged before they are properly matured and opened, they rarely open wide enough for convenient hand-picking. In order to save these damaged bolls, snapping is resorted to.

There is also some relation between the varieties of cotton grown in the various sections of Oklahoma and the percentage of cotton harvested by snapping. As has been shown in Table 12, the principal variety of cotton grown in the western part of the State is Half and Half. Harvesting by snapping is also most common in that part of the State. Since Half and Half cotton matures quickly, opens early, and the burrs can be easily detached from the stalk, it is a popular cotton for the large-scale farming practiced in those areas. Also because Half and Half cotton produces short lint on which no staple premiums are paid, the farmers are not as careful in the method used in harvesting as they probably would be otherwise. In the eastern area of the State, Delfos, Rowden, and other similar varieties are more popular, and most of the cotton is hand-picked. In these areas, due to climatic conditions, the cotton stalks grow larger and the bolls are well attached to the stalk. The difference in the amount of labor required to pick or snap this cotton is much less than it is for the kind of cotton produced in western Oklahoma. Also in these areas securing the necessary labor for harvesting is not as difficult a problem as it is in the western areas where snapping is more commonly practiced.

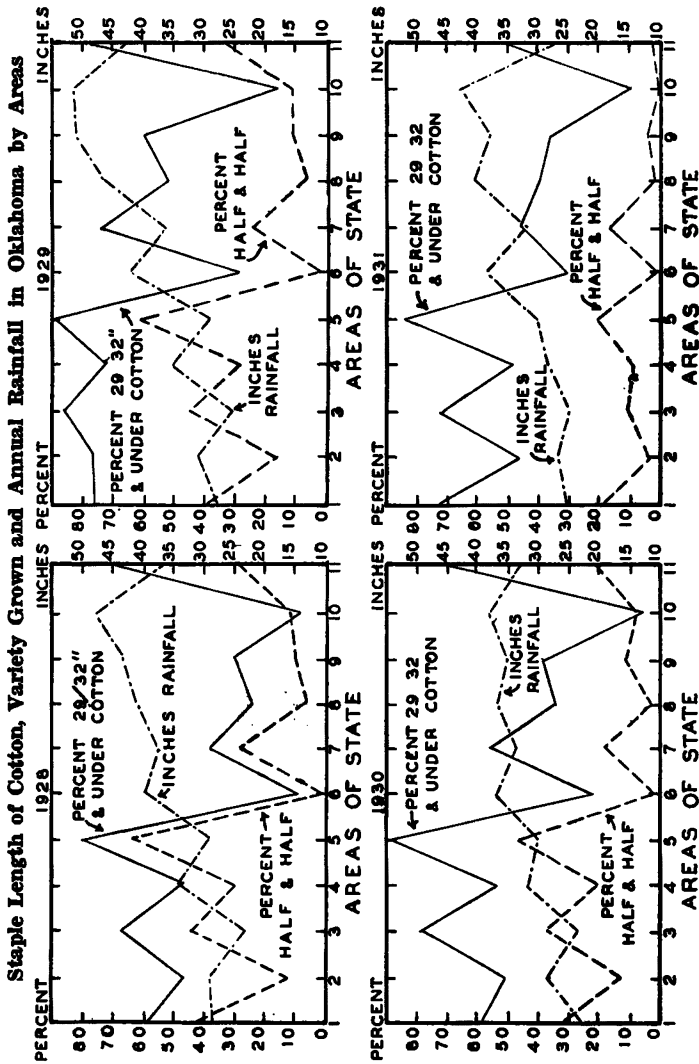
In the areas where large proportions of the cotton are harvested by snapping, cotton gins are equipped with extra cleaners and burr extractors to remove the excess trash and burrs from the snapped cotton. Although snapped cotton is run through these extra cleaners, it is generally believed that the grade of the lint is lower as compared with the same kind of cotton that has been hand-picked. The lint from snapped cotton nearly always carries a higher percentage of trash than does that from hand-picked cotton.

Variation in the Staple Length of Oklahoma Cotton

The interrelated influences of soil fertility, variety grown and rainfall are believed to largely determine the staple length of cotton produced in any area. These different factors are combined in various ways in different sections of the State and this variation may account for much of the dif-

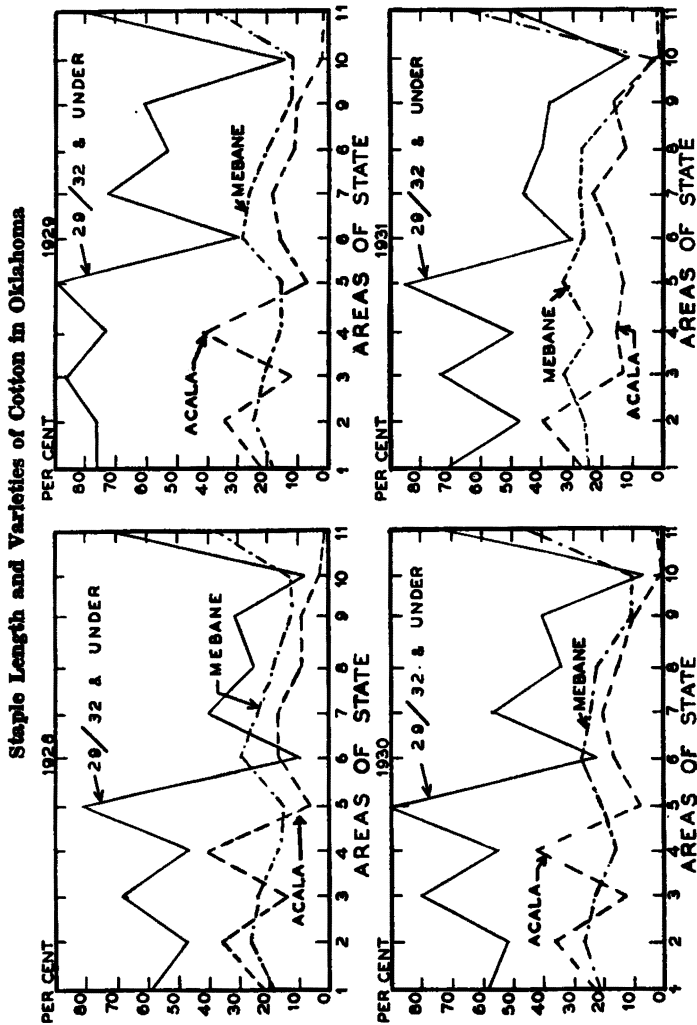
ferences in the staple lengths of the cotton grown in the different sections.

Figure XVI shows the relation between the percentage of cotton produced with a staple length of 29/32 inch and under; the percent of Half and Half cotton and the annual rainfall in the various areas of the State during the years 1928 to 1931. There is a direct relationship between the proportions of Half and Half grown and of short cotton produced in the several areas. During all four years studied, in areas where larger proportions of Half and Half were grown, correspondingly higher percentages



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 Figure XVI. Areas where a large proportion of Half and Half cotton was grown produced a larger proportion of short staple cotton than other areas. (See Figure II for location of areas.)

of short cotton were produced as compared with areas where smaller proportions of Half and Half were grown. For example, in 1928, in Areas 3 and 5, the percentages of Half and Half cotton grown were 44.9 and 64.0 respectively. In these areas the percentages of short cotton produced were 67.7 and 80.6; while in Areas 6 and 10, where only 2.1 percent and 12.0 percent respectively of the cotton was Half and Half, the percentages of short cotton for the Areas were 9.6 and 8.5. Generally, the western areas of the State grew large percentages of Half and Half cotton in each of the four years studied.



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 Figure XVII. Areas growing a large proportion of Acala cotton produced less short staple cotton than other areas in the western part of the State. (See Figure II for location of areas.)

Figure XVII shows the relationship between the percentages of Acala and Mebane grown and the percentages of short cotton produced in the various areas of the State. In the western Areas 1, 2, 3, 4, and 5, an inverse relation is shown between the percentages of Acala grown and short cotton produced for the four years studied. In the areas where relatively higher percentages of Acala were grown, the proportions of short cotton were low as compared with areas where the percentages of Acala were low. The relationship in the eastern areas of the State was much less regular because Acala was one of the varieties of lesser importance in most of these areas.

The proportions of Mebane show but little variation between different areas of the State as compared with some of the other varieties and consequently the chart shows very little relationship between the percentage of Mebane grown and the percentage of short cotton.

Rainfall varied inversely with the proportion of short cotton grown during each of the four years from 1929 to 1932. Figure XVI shows that in the areas where large proportions of the cotton produced were short in staple length, the annual rainfall was low, and in areas where only small percentages of short cotton were produced, rainfall was heavy.

In 1928, the annual rainfall in Area 3 was 23.5 inches, and in Area 4, 34.9 inches. The percentages of short cotton produced in the areas were 67.7 and 46.7 respectively. This shows that in the western section of the State a difference in rainfall between the areas was accompanied by a marked difference in the length of cotton produced. However, a much greater difference was shown between the western and eastern areas of the State. In Area 3, as has been shown, the rainfall for 1928 was 23.5 inches and the percentage of short cotton 67.7, while in Area 10, in the eastern part of the State, the annual rainfall was 48.2 inches and the percentage of short cotton produced was only 8.5. The same relationship existed during the other three years of the period studied.

Variation in the Grades of Oklahoma Cotton

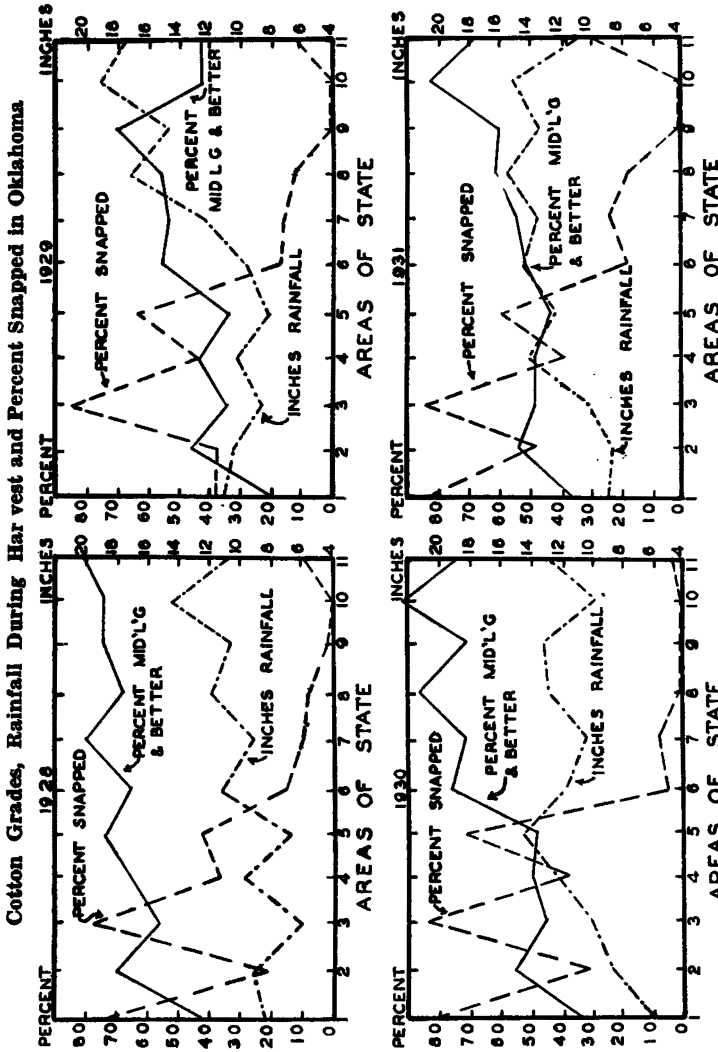
It is generally understood that rainfall during harvesting season, method and care used in harvesting, and the process and condition of ginning largely influence the grades of cotton. Figure XVIII shows the relation between the grades of cotton, the amount of rainfall during harvest season and the proportion of cotton harvested by snapping in Oklahoma by areas for each of the four years, 1928 to 1931.

As has been shown, higher percentages of cotton of the grades white middling and better were produced in the eastern areas of the State than in the western areas during all four years. Also the amount of rain which fell during the harvesting months, September, October, November, and December, was higher in the eastern areas than in the western areas. Usually large amounts of rainfall during the harvesting months have some bad effects on the grade of cotton; however, this was not always true as between areas of the State. For example, in 1929, the total rainfall during the harvesting months in Area 3 was 8.7 inches, and in Area 9, 14.9 inches. The percentage of cotton produced in Area 3 which was white middling and better in grade was 35.2, while in Area 9 it was 71.7 percent. Figure XIX shows that within the individual areas of the State there was an inverse relation between the amount of rainfall in different years and the percentage of white middling and better cotton that was produced; that is, during the years of heavy rainfall smaller proportions of the cotton were middling and better than in years when rainfall was relatively light.

The better grades of cotton ginned in the areas of heavy rainfall may be attributed in part to the quickness with which the cotton was harvested and to the method used in harvesting. The farmers in the western areas of the State, who grow large acreages of cotton, usually depend on outside

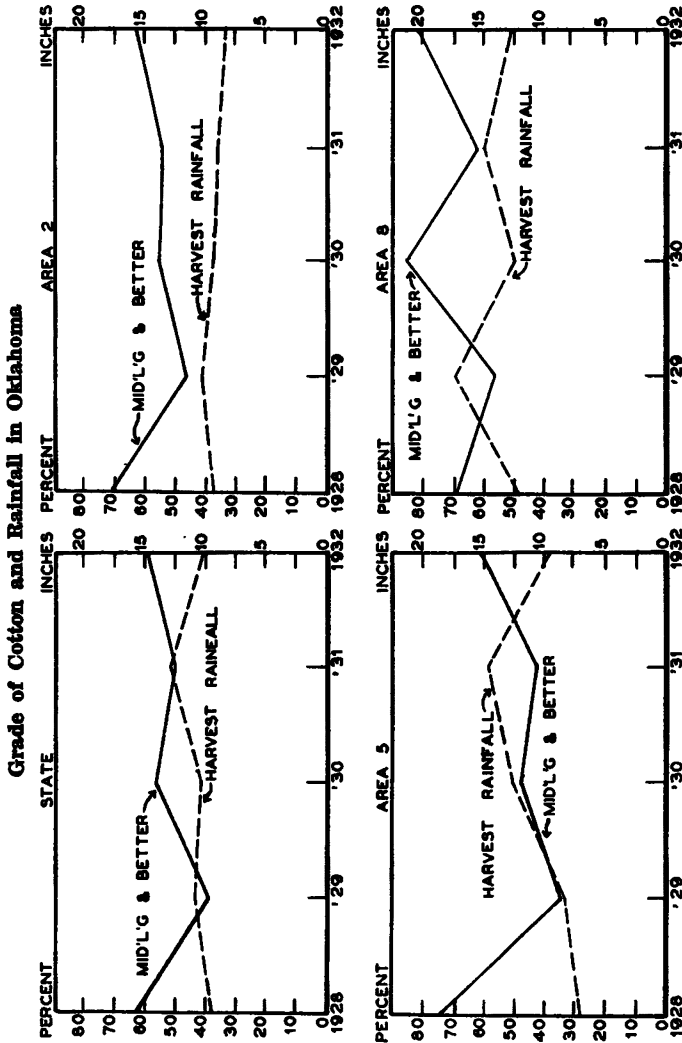
labor for harvesting their crop. They allow large amounts of their cotton to open before they begin harvesting. This subjects it to damaging weather conditions which lowers the grade. In the eastern areas the acreage of cotton per farm is not as large and the farmer's family can keep most of it picked as it opens, thereby eliminating weather damage to a large extent. Also most of the cotton in the eastern areas is hand-picked, while in the western areas a large part of the crop is harvested by snapping, which materially lowers the grades.

Figure XVIII also shows the relation between the percentage of cotton harvested by snapping and the percentages of white middling and better cot-



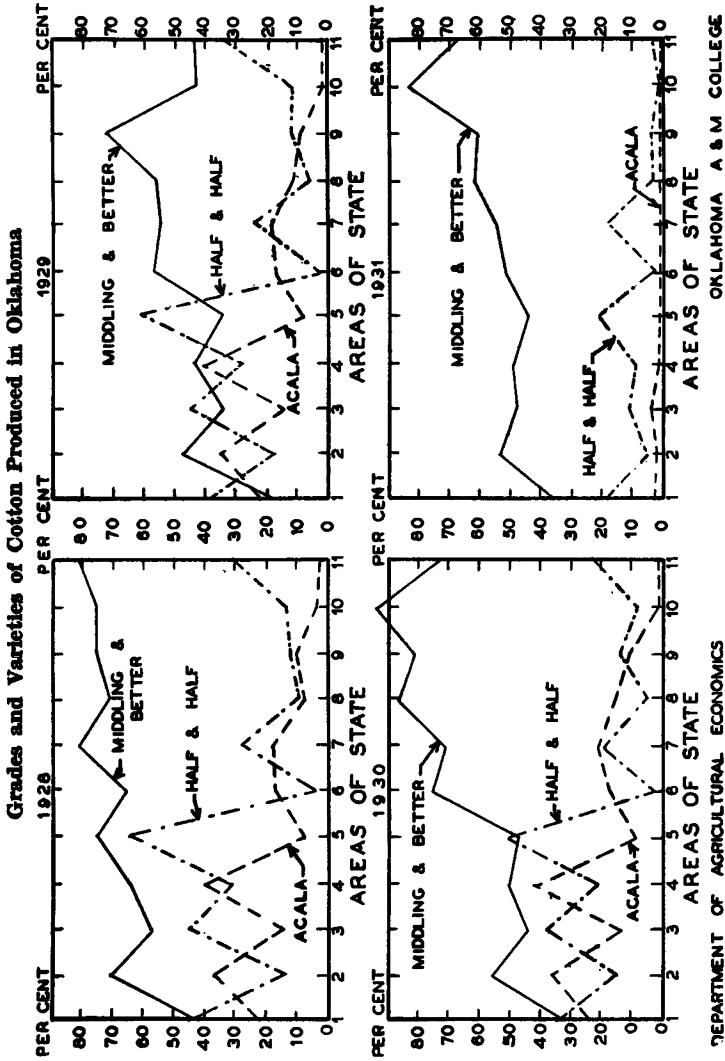
DEPARTMENT OF AGRICULTURAL ECONOMICS
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 Figure XVIII. Usually a smaller proportion of the cotton crop is middling and better in grades in areas where a large proportion of the crop is harvested by snapping than in other areas. (See Figure II for location of areas.)

ton by areas for each of the four years, 1928 to 1931. In the areas where large proportions of the cotton were harvested by snapping, the percentages of white middling and better cotton were low as compared with areas where smaller percentages were harvested in that manner. For example, in 1931, 84.9 percent of the cotton produced in Area 3 was harvested by snapping. In this Area 48.3 percent of the cotton was white middling and better in grade, while in Area 10, where no cotton was harvested by snapping, 83.4 percent of all cotton produced was white middling and better in grade.



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 Figure XIX. In most years of heavy rainfall during harvest a smaller proportion of the crop was middling and better in grade than in years of light rainfall during harvest.

Figure XX shows the relationship between the more important varieties of cotton grown in the several areas of Oklahoma and the percentage of white middling and better cotton produced during the four years studied. Generally in areas where large proportions of Half and Half cotton were grown, the percentages of middling and better cotton were low as compared with the areas where only small proportions of Half and Half were grown. For example, in 1930, 21.1 percent, 48.0 percent and 7.9 percent of the cotton grown in Areas 4, 5, and 10 respectively, was Half and Half and



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 Figure XX. There is less relationship between the variety of cotton grown and the grades of cotton than there is between variety and staple length, although the percentage of high grade cotton was usually smaller in areas growing a large production of Half and Half cotton than in other areas.

in these respective areas 49.7 percent, 48.8 percent and 94.2 percent of the cotton was white middling and better. Figure XX also shows the relation between the percentages of Acala cotton grown and the percentage of white middling and better cotton produced in the areas of Oklahoma for the four years 1928 to 1931. Particularly in the western areas of the State there was a direct relation between the proportions of Acala grown and the percentage of high grade cotton.

Some varieties of cotton have been bred to produce large bolls that are storm resistant which prevents the cotton, after it has opened, from falling out on the ground when it is subjected to wind and rain. Half and Half has not been bred for storm resistance and when this variety is open and weather conditions are adverse, large amounts of the lint are blown from the burr to the ground and are damaged. The high percentage of low grade cotton in the western areas of the State may be caused in part by the large proportions of Half and Half cotton grown there.

Influence of Ginning on Quality

The process of ginning cotton is very delicate. Many variations in the kinds of cotton brought in and the condition in which it is brought, make it hard for the ginner to adjust his machinery so as to gin each lot of cotton to the best advantage.¹¹ The cotton brought to a cotton gin in one day may vary in staple length from 3/4 to 1 1/8 inches in length. It may be clean-picked cotton or roughly snapped, ranging in grade from good middling to strict good ordinary or even lower. The cotton may be extra dry or it may be almost too wet to gin. Although the modern ginning plant is adjustable to meet certain of the above conditions, it is almost impossible to set the machinery to meet the individual needs of each lot of cotton brought in during the day's run, particularly in areas where a large proportion of the cotton is ginned in three or four months and the average day's ginnings are heavy.

Wet or extra damp cotton is often damaged in both grade and staple length when ginned. Not only is the quality of the cotton damaged but the seed and lint percent turnouts are often lowered due to large proportions of the seed and lint being blown over with the leaves, parts of stalks and other forms of trash which are removed from the cotton in the ginning process. When cotton is ginned wet, large quantities of the leaves, burrs and other forms of trash are not removed from the lint in the ginning process. Nearly all types of cleaners in gin plants are built on the "beater" and screen principles under air circulation. In wet cotton the leaves and trash adhere to the cotton more closely than in dry cotton. As a result, a higher proportion of the trash is retained in the ginned lint. Wet cotton also adheres to some extent to the machines through which it passes during the ginning process, often choking up the machines. This causes the lint to be unevenly placed and often causes twists or ropes of fibers to be formed in the ginned lint.

In wet cotton the fibers are often nepped and gin cut while being pulled from the seed by the gin saws. In the milling process, ropiness and neppliness in cotton reduces the spinning value, in that "ropes" and "neps" are often discarded as waste. In gin cut cotton, the original length and evenness of the fibers is destroyed, which also lowers the spinning value of the cotton. Other things that, during the ginning process, may effect the quality of cotton are temperature, improper speed of ginning, types of machinery, ratio between speed of movements of different machines, and condition and speed of saws.¹²

¹¹Webb, Robert W., *Problems and Research Methods in Cotton Ginning*, United States Department of Agriculture, Bureau of Agricultural Economics, Washington, D. C. A Mimeographed Release.

¹²Ibid.

APPENDIX

TABLE 1.—Percent of Seed Cotton Harvested in Oklahoma by Snapping by Counties, 1924-1931

County and area	8-yr av.	1924	1925	1926	1927	1928	1929	1930	1931
STATE	42.6	20.4	42.1	49.2	24.6	45.1	59.4	47.2	51.1
<i>Area 1—Total</i>	75.8	48.0	84.5	76.7	53.1	76.0	83.9	82.9	85.9
Beckham	65.2	29.7	79.2	75.0	38.6	65.1	73.0	72.4	69.5
Custer	84.5	50.7	85.8	80.9	60.4	76.8	94.0	96.0	95.9
Dewey	87.5	60.8	84.0	88.2	77.2	91.2	95.3	78.2	95.1
Ellis	66.1	32.2	—	—	—	—	—	98.5	74.5
Roger Mills	75.8	27.2	83.6	77.6	49.4	67.3	86.3	75.3	88.8
Texas	59.3	59.3	—	—	—	—	—	—	—
Washita	81.8	64.4	90.7	81.4	63.4	87.1	90.0	92.6	93.3
Woodward	52.1	—	—	—	—	—	—	100.0	37.6
<i>Area 2—Total</i>	34.1	22.9	39.3	—	16.2	21.0	35.5	30.8	46.1
Alfalfa	74.9	—	—	43.6	—	—	63.2	78.0	80.8
Blaine	51.4	29.1	63.8	62.8	33.2	46.8	46.9	48.0	62.6
Canadian	38.6	19.2	41.9	56.2	17.8	22.0	46.3	32.3	46.2
Garfield	59.6	—	—	22.6	10.9	7.4	30.2	84.0	82.1
Kay	43.6	—	—	—	30.3	52.3	—	—	—
Kingfisher	48.1	19.8	63.2	47.7	16.2	18.6	48.6	36.3	68.0
Logan	19.7	15.4	19.7	33.0	5.7	5.4	21.5	14.7	28.4
Major	73.4	—	—	—	—	—	—	72.4	74.0
Noble	23.7	15.4	20.4	38.1	7.2	11.6	23.9	13.0	33.4
Oklahoma	27.8	29.4	39.8	40.8	14.8	10.0	24.1	14.4	31.1
<i>Area 3—Total</i>	65.8	32.0	78.8	71.5	24.8	79.4	85.6	85.7	84.9
Greer	72.1	31.4	82.1	78.7	35.6	83.4	90.5	89.3	93.1
Harmon	63.1	28.1	85.2	72.4	18.8	79.2	95.2	94.0	85.4
Jackson	63.9	22.6	82.9	68.5	19.4	82.8	86.4	86.1	81.0
Kiowa	74.9	56.7	89.1	77.4	30.2	79.6	90.2	88.0	92.6
Tillman	55.6	24.9	61.7	63.6	21.5	71.7	69.6	76.5	75.5
<i>Area 4—Total</i>	40.5	28.2	47.0	54.2	23.0	37.3	44.1	39.6	40.7
Caddo	42.7	28.1	49.2	54.0	26.2	41.7	47.8	44.2	44.8
Cleveland	31.2	15.8	42.3	45.9	18.1	15.3	27.9	25.7	23.0
Grady	43.2	36.7	48.8	59.8	23.9	38.8	41.8	41.1	39.5
McClain	31.5	17.1	39.4	49.2	10.7	27.4	—	24.2	35.8

(continued)

APPENDIX
TABLE 1.—(continued)

County and area	8-yr av.	1924	1925	1926	1927	1928	1929	1930	1931
<i>Area 5—Total</i>	51.4	24.2	65.2	57.1	20.6	43.6	69.2	72.4	60.7
Comanche	53.8	28.2	55.4	66.2	21.5	54.0	65.8	73.7	69.1
Jefferson	52.7	23.5	78.6	46.9	22.6	38.6	82.2	82.5	55.0
Cotton	63.6	36.1	80.7	60.3	25.2	58.4	86.0	90.7	84.4
Stephens	40.6	15.5	54.8	55.8	13.6	24.4	46.9	51.5	45.0
<i>Area 6—Total</i>	17.1	12.7	18.1	26.0	10.1	15.6	17.0	6.3	19.0
Craig	16.8	27.7	10.1	14.6	3.4	23.2	21.8	19.6	24.6
Creek	9.4	4.4	9.8	14.0	2.4	4.6	8.1	3.5	17.6
Delaware	5.1	—	5.5	—	—	—	—	—	—
Mayes	18.1	6.7	15.8	32.1	21.7	16.6	15.8	17.1	5.3
Muskogee	18.7	9.0	19.6	30.0	11.5	20.9	21.3	4.5	21.2
Nowata	29.2	39.8	22.3	52.7	21.8	31.0	20.4	12.2	20.3
Okmulgee	11.4	7.9	5.9	18.0	3.4	9.0	14.5	3.0	21.1
Osage	15.1	27.0	15.0	20.6	11.5	13.2	8.1	4.3	14.5
Ottawa	—	—	—	—	—	—	—	—	—
Pawnee	20.6	20.6	24.5	37.0	5.6	14.1	10.2	4.5	13.4
Payne	16.5	13.1	23.9	29.7	6.5	6.4	16.4	6.6	13.3
Rogers	23.5	20.8	18.0	34.2	17.6	30.9	23.7	18.8	22.7
Tulsa	21.5	15.8	20.0	33.8	17.3	21.5	25.9	6.2	18.0
Wagoner	25.1	22.9	27.8	29.2	14.3	28.6	24.5	17.9	23.9
Washington	41.2	—	—	48.0	21.0	—	—	—	—
<i>Area 7—Total</i>	16.7	4.9	20.7	26.1	5.2	10.2	17.9	8.3	25.4
Carter	21.1	2.6	42.5	24.3	5.6	11.0	18.0	8.6	23.3
Garvin	27.2	6.1	33.2	39.0	9.8	19.6	33.0	21.5	37.5
Johnston	18.8	5.1	27.3	33.3	22.3	13.0	7.8	3.0	30.3
Lincoln	9.4	3.0	11.2	16.3	.3	4.7	10.0	3.0	19.0
Murray	25.1	13.4	31.6	42.6	1.3	5.5	32.6	10.0	37.2
Pontotoc	10.1	.5	5.7	16.6	1.1	5.3	15.6	2.8	26.6
Pottawatomie	14.9	7.7	17.6	26.9	5.5	6.8	12.9	2.9	10.4
Seminole	3.8	.6	1.6	9.2	.3	.7	8.0	.3	7.4

APPENDIX

TABLE 1.—(continued)

County and area	8-yr av.	1924	1925	1926	1927	1928	1929	1930	1931
Area 8—Total	10.0	2.2	11.8	15.2	1.4	8.0	13.2	1.9	18.5
Atoka	4.5	.4	5.6	13.5	3	3	3	3	6.3
Choctaw	4.0	3	13.4	1.4	3	.3	.2	3	.5
Coal	11.2	1.3	7.9	24.4	7.4	10.4	9.3	3	16.0
Hughes	7.2	.5	5.1	13.8	.1	8.6	7.5	.1	16.5
McIntosh	13.0	3.2	18.0	19.3	.4	8.1	28.6	2.5	15.0
Okfuskee	9.5	1.1	7.8	9.7	.9	10.9	6.6	1.3	30.2
Pittsburg	14.3	5.5	16.1	19.0	5.0	9.5	20.5	4.8	25.4
Area 9—Total	5.0	2.1	8.7	11.1	.1	2.0	1.1	3	.7
Adair	6.0	2.4	1.4	18.3	3	1.9	3	3	3
Cherokee	6.8	.5	7.5	18.5	3	2.7	.8	3	3
Haskell	6.2	3	9.4	15.6	.2	3.1	4.1	3	2.6
Latimer	8.0	3.8	6.5	28.7	3	2.5	3	3	.4
LeFlore	3.2	4.6	4.6	7.2	3	2.5	3	3	3
Pushmataha	1.1	.2	1.8	3.2	.1	.1	.2	3	.2
Sequoyah	7.6	3	19.1	9.8	3	3	3	3	.2
Area 10—Total	.9	3	3.1	3.0	3	3	3	3	3
McCurtain	.9	3	3.1	3.0	3	3	3	3	3
Area 11—Total	14.9	3.0	27.9	26.1	9.8	8.9	13.2	2.5	11.7
Bryan	14.0	2.2	26.6	19.0	2.9	8.5	10.8	2.7	13.4
Love	15.8	6.3	20.3	39.7	16.5	11.0	21.9	6.0	7.1
Marshall	16.7	.9	42.2	31.6	8.2	7.6	12.2	.6	12.0

¹Compiled from individual gin reports on file with the Oklahoma Corporation Commission. (Data listed in pounds of seed cotton brought to gins.)

²Less than 100,000 pounds.

³Less than 0.1 percent.

APPENDIX

TABLE 2.—Rainfall During Harvesting Months of September, October, November, and December in Oklahoma by Areas of the State, 1924-1931¹
(Inches)

Areas	1924	1925	1926	1927	1928	1929	1930	1931	Eight yr. average
Average all areas	7.56	12.10	16.93	10.54	9.61	11.62	11.27	12.79	11.55
1	6.64	9.39	14.48	4.93	8.40	11.33	6.86	9.16	8.90
2	5.75	15.30	15.31	7.46	9.20	9.47	9.17	8.85	10.06
3	5.60	10.48	14.59	6.21	6.11	8.66	10.45	10.27	9.05
4	5.38	12.72	14.99	10.40	8.93	10.32	12.46	14.22	11.18
5	3.74	13.27	14.65	8.20	6.92	8.36	14.91	12.89	10.37
6	10.51	11.91	19.77	13.38	11.24	9.88	12.52	14.32	12.94
7	6.84	12.77	16.11	10.46	9.14	12.36	11.21	13.75	11.59
8	7.41	13.25	19.90	12.33	11.95	17.32	12.56	15.76	13.81
9	12.44	14.73	18.87	14.06	10.93	14.90	13.21	13.51	14.08
10	11.59	16.12	18.66	14.33	14.44	19.45	10.32	15.21	15.02
11	8.00	12.92	14.14	15.94	11.40	17.89	13.31	10.76	13.04

¹Compiled from Annual Weather Reports of the United States Department of Agriculture Weather Bureau.

APPENDIX

TABLE 3.—Rainfall in Oklahoma by Areas of the State, 1924-1931¹
(Inches)

Areas	1924	1925	1926	1927	1928	1929	1930	1931	Eight yr. average
Average all areas	28.30	29.27	40.93	43.22	31.06	35.68	32.90	33.43	34.35
1	23.31	23.20	34.86	24.98	28.93	28.85	23.53	25.65	26.66
2	24.37	26.19	37.68	32.64	29.55	31.44	29.17	27.13	29.77
3	23.17	27.58	36.13	24.01	23.51	25.31	23.88	25.65	26.16
4	23.99	31.53	36.02	40.06	34.93	36.54	32.18	29.23	33.06
5	21.39	30.75	34.38	33.44	29.02	29.60	30.76	30.70	30.00
6	36.82	29.90	45.00	52.63	40.30	42.47	37.61	39.46	40.52
7	27.07	29.10	43.16	42.56	37.99	36.85	34.34	32.72	35.47
8	27.98	32.86	42.67	49.77	41.61	46.92	37.15	41.12	39.89
9	39.46	33.57	50.53	62.81	43.39	51.33	35.90	38.93	44.49
10	35.27	41.88	56.04	56.62	48.23	51.95	38.68	43.49	46.51
11	29.05	28.32	52.35	53.75	36.91	43.20	33.69	28.27	38.19

¹Compiled from Annual Weather Reports of the United States Department of Agriculture, Weather Bureau.