FACTORS AFFECTING THE MARKET FOR COTTONSEED IN LOCAL MARKETS OF SOUTHWESTERN OKLAHOMA

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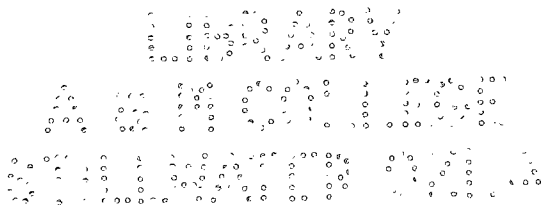

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CHAPTER I. INTRODUCTION

Cottonseed as a Waste Product

Cottonseed, a subordinate joint-product to production of lint cotton, was formerly regarded as a nuisance by all individuals connected with the cotton industry, but a necessary evil indispensable in the production of cotton lint. In fact, with the increase in production after 1830 the disposal of the bulky raw seed became a problem. Cottonseed was utilized primarily as seed to plant, secondarily as fertilizer by the thrifty farmer, and lastly as a food largely for cattle and sheep. In some of the new states having new fertile soils the seed was sometimes thrown into rivers, buried, burned, or otherwise disposed of in the easiest way possible.[1/]

Seed disposition became so acute that it was necessary to employ legal measures to solve the problem. The following quotation from the Revised Code of Mississippi, 1859[2/] is an example of how forced disposition of cottonseed at times was accomplished:

> "Article 18. Every owner or proprietor of any cotton-gin erected within a mile of any city, town, or village, is hereby required to remove or destroy all cottonseed which may fall from such gins, so that the same shall not prejudice the health of the inhabitants of such city, town, or village, and every person being an owner or proprietor of a cotton-gin situated as aforesaid who shall neglect or refuse to remove or destroy the cottonseed in and about such gin, having received five days notice, shall forfeit and pay the sum of $20 for every day he or she shall neglect or refuse to remove or destroy the cottonseed as aforesaid, to be recovered by warrant in the name of the State before any justice of the peace of the proper county for the use and benefit of said county.

1/ B. W. Kilgore, The Feeding Value of Cottonseed Products, United States Department of Agriculture Experiment Station Bulletin No. 33, p. 385.

2/ Census of Manufactures 1900, Volume IX, Part III, United States Department of Commerce, Bureau of Census, p. 588.

"Article 19. No person who shall be the owner or proprietor of any cotton-gin shall be authorized to throw or permit to be thrown the cottonseed from such gin into any river, creek, or other stream of water which may be used by the inhabitants for drinking or fishing therein, and any person offending herein shall forfeit and pay for every such offence the sum of $200 to be recovered in any county of competent jurisdiction, by action of debt or information in the name of any person who will sue for the same, one moiety thereof to such person and the other moiety to the county in which the offence occurred."

Fortunately, from the standpoint of the Southern economy, and the additional impetus given to cotton production by the removal of such a parasite from the cotton industry, research workers discovered the intrinsic value of the cottonseed; first as a fertilizer, then as a food for man and beast. Many of these discoveries were accidental or resulted from informal observations by those closely connected with the industry. However, these findings were insignificant since a majority of the discoveries, were made by individuals when conducting controlled experiments.[3/]

The value of cottonseed prior to the advent of the cottonseed crushing industry was determined by the demand for planting seed. Although this demand was relatively small, (Hammond estimated this as 7 percent of the total seed produced in 1896) seed sold on the average for approximately 12.5 cents per bushel.[4/] Farmers who practiced pure seed production were able to obtain a higher price, but it seems that no one sold planting seed for less. Very likely the individual would need to provide storage space in addition to that needed for his own and 12.5 cents was the minimum price necessary to induce the individual to

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3/ Robert S. Curtis, Cottonseed Meal, Robert S. Curtis Publishing Company, 1938, pp. 18-35.

4/ Cotton Production, Special Reports, Bureau of Census, United States Department of Interior, Tenth Census, 1880, Volume VI, Part II.

provide these facilities. Cotton oil mills complained in their reports to the Bureau of Census of 1880 that the small white farmer and negroes seldom saved any seed to plant. Therefore, the mills and the larger farmers were forced to provide this service.

First Attempts to Process Cottonseed

The cottonseed crushing industry was established primarily to produce oil. Wholesale prices of cottonseed oil (Prime Summer Yellow) in New York averaged 7.6 cents per pound for the year 1875.[5/] Although 7.6 cents is not an abnormally high price when compared to an average of 8.9 cents for the period 1934-1938,[6/] crushing was very profitable. While the cottonseed may cost the mill 30 to 40 dollars per ton f. o. b. gin house at present, seed cost 8 to 12 dollars per ton delivered to mills as late as 1881.[7/] Although techniques of extraction were crude, the returns to the industry were very high. These high returns were possible as materials used in manufacturing were relatively cheap.

Mills were not dependent upon returns from oil to cover the entire cost in their infancy. Feeding of cottonseed meal was negligible or non-existent. It was, however, readily disposed of in the market as a fertilizer,[8/] although reports indicate objections even for such a use.

5/ G. M. Weber, and C. L. Alsberg, American Vegetable-Shortening Industry, Palo Alto, Stanford University Press, 1934, p. 345.

6/ Yearbook of Agriculture, 1940, United States Department of Agriculture, p. 137.

7/ Harry Hammond, The Handling and Uses of Cotton, United States Department of Agriculture Experiment Station Bulletin No. 33. p. 373.

8/ Ibid. p. 377.

The state inspector of Georgia, in 1876, was reported to have refused to certify a fertilizer as standard because it contained cottonseed meal.[9/]

The cottonseed crushing industry was begun by the establishment of a mill in Columbia, South Carolina in 1826.[10/] Just as this mill was the beginning of an industry, it was also the first of a succession of failures, attributable variously to bad management, poor construction, and a shortage of seed to crush, because only one mill located at Natches, Mississippi was operating in 1831, and a single mill was in operation at New Orleans in 1847. This latter mill evidently met with the same bad end as the others had previously since a Mr. Good of that city received only a small vial of oil as his share of a $12,000 investment.

Later attempts to establish the industry met with greater success as shown by Hammond's record of instances of mills declaring dividends as high as 60 percent prior to 1896.[11/]

Organization and Growth of the Cottonseed Crushing Industry

Type of organization of the cottonseed crushing industry followed the general pattern of the steel and petroleum industries with horizontal and vertical integration. The annual report of the American Cotton Oil Company for 1891 gave the combined capital as 34 millions of dollars. And according to the census of 1890 there were 119 mills in

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9/ Hammond. Op. cit. p. 378.

10/ Hammond. Op. cit. p. 366.

11/ Hammond. Op. cit. p. 375.

operation, 72 of which were listed as assets of the American Cotton Oil Company. Some of the earlier historians of the industry contended that the large combination was essential to the development of the industry. Opposite views were held by others and in a survey of prices, disposition, and utilization of the seed by the Bureau of Census in 1890 complaints were made of the combination and charges of collusion with transportation agencies against the industry. These opinions evidently were only passive at the time, yet they remained perhaps as grounds for suspicion because in 1928, the industry underwent a congressional investigation. The Federal Trade Commission's Report, however, refuted all charges of conspiracy in restraint of trade or of unfair trade practices.[12/] The Commission also stated that these concerns occupied no monopolistic positions, at least in any large territory.

The cottonseed industry had just begun to approach a semblance of its present size in 1890 when 119 mills were in operation. At the close of the century it had increased 300 percent over that of 1890 but did not reach the peak of expansion until 1914 when 872 mills were reported by the census. Since that date the number of mills has decreased but the amount of seed crushed has increased as well as the value of the products. In 1890 of the 119 mills established five mills were not located in the South.[13/] These mills according to Hammond[14/] were not in operation in 1894-95, as "the cost of transportation had brought the

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12/ Senate Document No. 209, 71st Congress Second Session.

13/ Census of Manufactures, 1890, Volume VI, Part I, p. 258. Three of these mills were in New York, one each in Ohio and Rhode Island.

14/ Hammond, Op. cit. p. 375.

mills to the seed." After cottonseed oil became the principal ingredient of compounds, most of the refineries were reestablished in the South.

The Economic Significance of the Income from from Cottonseed to the South

The creation of an economic good from a waste product has brought to the South a farm enterprise second only to cotton. The relative importance of cottonseed in the southern farm economy is ascertained by comparison of the cash income from the principal cash crops. (Table 1). In the 18 years, 1919 to 1936, the cash income from cottonseed was second to cotton lint in 13 years and was exceeded by cotton and wheat the other five years. In seven years of the period, 1919 to 1936, the cash income from cottonseed was greater than the combined cash income from the small grain crops—wheat, corn, oats, barley, and rye. This indicates that the cash income from seed has become highly significant in recent years. This significance is further indicated by a comparison of the index of purchasing power for grains and cottonseed in Oklahoma for these years. (See Table 1).

If Oklahoma can be used as a fair sample of demand for cottonseed or cottonseed meal, it would seem that the demand for cottonseed compared very favorably with that of small grains measured in terms of purchasing power.

Purpose and Scope of Study

The object of this study was to discover the factors affecting the marketing of cottonseed and cottonseed prices in the local markets of western Oklahoma. From the foregoing introduction it is evident that

Table 1. Total Cash Farm Income Received by the Eleven Principal Cotton Growing States from Cotton, Cottonseed, and Small Grain Crops, 1919-1936 1/

(000)

Year	Cotton	Cottonseed	Wheat	Corn	Oats	Barley	Rye	Total Small Grains
				(Dollars)				
1936	715,201	131,164	61,628	24,589	4,920	493	653	92,283
1935	580,835	97,747	50,822	17,576	6,400	559	637	75,994
1934	717,223	98,010	58,227	11,881	5,142	549	565	76,364
1933	510,216	46,670	38,297	11,135	3,726	326	507	53,991
1932	406,833	40,712	30,242	13,243	3,743	430	394	48,052
1931	454,776	39,297	45,763	14,642	6,472	613	360	67,850
1930	692,738	92,341	58,418	21,323	6,394	649	579	87,363
1929	1,304,320	143,012	98,715	25,403	5,908	1,007	530	131,563
1928	1,252,613	153,345	107,613	37,001	8,738	1,188	712	155,252
1927	1,314,365	149,751	101,616	46,812	12,551	1,204	938	163,121
1926	1,061,616	124,337	140,450	25,597	12,203	1,701	969	178,920
1925	1,562,840	156,707	80,149	29,690	9,262	700	992	120,793
1924	1,479,109	136,775	105,666	30,857	14,702	1,692	791	153,708
1923	1,416,300	118,237	75,968	26,236	9,224	905	788	113,121
1922	1,042,089	85,711	76,394	31,458	7,829	622	852	117,115
1921	754,636	81,078	130,559	29,943	9,114	606	995	171,215
1920	1,338,300	107,223	235,697	49,569	29,917	1,616	2,820	319,619
1919	2,007,339	239,910	290,803	44,494	23,954	1,250	2,922	363,403

SOURCE: Income Parity for Agriculture, Part I, Farm Income, Sections 1, 5, 7, 9, 10, United States Department of Agriculture, Bureau of Agricultural Economics; Agricultural Adjustment Administration and Bureau of Home Economics.

1/ The eleven states are: Oklahoma, Texas, Missouri, Arkansas, Louisiana, Mississippi, Tennessee, Alabama, Georgia, North Carolina, and South Carolina.

there are many ramifications inherent in the industry that must be considered. The cottonseed industry (processing) can best be characterized by the term monopoly when describing the type of organization and oligopsony when referring to the industry's influence in the market. It is beyond the scope of this paper to attempt an analysis of these influences in the market and their effects on farm prices. But an attempt is made to analyze objectively the economic forces that govern the prices that can be or are paid for the raw product, cottonseed, and farm prices are studied in their relationship to marketing practices and marketing agencies.

Procedure

Historical material relative to the cottonseed industry has been assembled at various times in heterogeneous reports. From these reports data pertaining to the origin of the industry were secured, and form the basis for this brief historical summary which it is hoped will furnish a perspective of the problems within the industry.

Cottonseed when processed produces four separate and distinct by-products—oil, meal, linters and hulls. The demand for cottonseed is a composite demand for the four by-products. However, because of the high relative values of oil and meal compared to hulls and linters the supply-demand relationship for these two products and competing products were considered.

It was necessary to supplement price, demand, and supply data available with current material for the area studied. Additional material was necessary particularly when studying local marketing and marketing practices.

To simplify the problem of price analysis the southwest counties of Oklahoma were arbitrarily divided into two groups, and for lack of a more descriptive term, that would be indicative of their characteristics, the two groups were designated southern and northern counties.[15/] However, various factors were used in setting up the two groups. The primary consideration was that the southern counties would more likely be influenced by mill prices at Fort Worth, Texas while it was anticipated that the prices in the other groups would reflect the demand in Oklahoma City rather than in Fort Worth.

This was substantiated when a check on the location of mills to which the gins, cooperating in the price study, sold seed during the two seasons. In addition to the above factor, the counties differed in the percentage of total cultivated land in cotton. The southern counties had 24.5 percent and the northern counties 20.1 percent.[16/] It was felt that if in any event the marketing organization was more developed a break down on this basis would reveal such a situation, and assist in isolating this factor in the price analysis. Farm prices, gin prices to farmers, and mill prices to gins for the seasons of 1937-38 and 1938-39 were taken directly from the records of the gins. Seventy-seven schedules were taken in 1937-38 and 60 in 1938-39.

A weighted weekly average price was first calculated for the two groups for both mill and gin prices. The range in prices was

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15/ Southern Counties: Comanche, Cotton, Greer, Jackson, Jefferson, Kiowa, Stephens, Tillman, and Harmon.

Northern Counties: Beckham, Blaine, Caddo, Canadian, Custer, Dewey, Garvin, Grady, McClain, Murray, Washita, and Roger Mills.

16/ Census of Agriculture, Volume I, 1935, Bureau of Census, United States Department of Commerce.

established more to clearly present the dispersion. All trends were calculated by the least squares method using only one variable. After establishment of the trend of prices for cottonseed, cottonseed oil, and cottonseed cake, actual prices were expressed as a percentage of the trend value. This enabled an analysis on a comparable basis of price changes for the three products to be made.

CHAPTER II. THE HISTORICAL DEVELOPMENT OF THE COTTONSEED INDUSTRY

As cottonseed, a joint produce of cotton lint, was for many years considered a waste and nuisance the production of lint cotton was an established economic enterprise on millions of farms before any thought was given toward the development of a cottonseed industry. However, cotton production was not retarded for lack of cottonseed utilization as an industrial product. In 1790 the United States produced 7,000 bales (400 pounds weight) and by 1873, prior to the advent of the cottonseed industry, 5,123,000 bales were produced.[1/] Production costs were levied entirely against the lint cotton produced. It would be purely a matter of speculation to attempt to evaluate the influence of the lack of a market for cottonseed during the expansion of cotton production. The effect might have resulted in a lower price for cotton lint, but this is highly doubtful. The entire period from 1800 to 1914 may be described as one of increasing pressure of demand on supply for lint, not because the world's supplies were not increasing or sufficient but because the potential demand was increasing faster than the supply.[2/] Additional income from cottonseed might have increased the incentive for investing capital in cotton production which would have caused a more rapid development of the southern agricultural land. The influence would have been negligible for cottonseed could be manufactured economically only when it could be transported to mills at a very low cost.

1/ Cotton Statistics and Related Data for Agricultural Workers, United States Department of Agriculture, Bureau of Agricultural Economics, 1932.

2/ John A. Todd, The Marketing of Cotton, 1934, p. 15.

Table 2. Sales and Cash Income from Cotton Lint and Cottonseed, Oklahoma, 1910-1938

Calendar Year	Sales	Average Price Per Pound Cotton	Income from Cotton	Sales	Average Price Per Ton Cottonseed	Income from Cottonseed	Percent Cottonseed Income is of Cotton Lint Income
	(1,000 Bales)	(Cents)	(1,000 Dollars)	(1,000 Tons)	(Dollars)	(1,000 Dollars)	(Percent)
1910	828	13.4	55,204	283	20.96	5,936	10.75
1911	997	10.0	50,055	255	15.86	4,052	8.09
1912	1,022	10.5	53,436	310	16.66	5,166	9.67
1913	886	11.9	52,679	227	20.40	4,629	8.79
1914	1,005	7.5	37,540	383	12.55	4,805	12.80
1915	953	9.2	43,930	246	27.83	6,838	15.56
1916	845	16.0	67,590	326	42.40	13,814	20.44
1917	937	24.4	114,168	322	61.77	19,878	17.41
1918	598	27.9	83,256	195	62.45	12,184	14.64
1919	956	33.7	161,101	273	60.91	16,610	10.31
1920	955	19.9	94,831	360	28.01	10,092	10.64
1921	936	11.5	53,724	250	21.45	5,367	9.99
1922	685	20.2	69,317	169	27.32	4,625	6.67
1923	672	27.7	93,280	150	38.65	5,809	6.23
1924	1,345	22.6	151,741	477	32.16	15,340	10.11
1925	1,733	20.0	173,814	566	29.58	16,754	9.64
1926	1,410	11.8	83,195	537	17.70	9,508	11.43
1927	1,341	17.1	114,367	457	30.49	13,940	12.19
1928	1,035	17.8	92,001	382	33.04	12,618	13.72
1929	1,414	16.8	118,687	360	31.13	11,194	9.43
1930	860	9.5	40,721	240	23.80	5,719	14.04
1931	1,166	5.4	31,397	324	8.57	2,779	8.85
1932	1,114	5.7	31,568	357	8.65	3,091	9.79
1933	1,087	18.6	46,745	354	10.36	3,666	7.84
1934	640	11.7	37,471	93	32.04	2,967	7.91
1935	514	10.7	27,469	162	30.04	4,875	17.74
1936	357	10.8	19,231	96	29.32	2,812	14.62
1937	684	7.4	25,222	266	17.98	4,748	18.96

SOURCE: Income Parity for Agriculture. Part I. Farm Income. Section I. Income From Cotton and Cottonseed, Bureau of Agricultural Economics, Agricultural Adjustment Administration, Bureau of Home Economics, United States Department of Agriculture, 1938.

The census of 1860 gives the price of cottonseed delivered at the mills as $6.00 per ton. If producers sold directly to the mills the net income from the seed would have been insignificant. The price of cotton in 1860 was 12.3 cents per pound and averaged 11.4 cents for the decade prior to 1860.[3/] However, the relationship between income from cotton lint and cottonseed changed materially after 1860. In the period 1909 to 1937 the cash income to producers from the sale of seed ranged from 8.0 percent of lint income to 20.2 percent. The modal income was 11.5 percent. (Table2).

A Brief Review of Early Attempts to Process Cottonseed

It was not until 1783 that any thought was given to the possibilities of producing useful products from cottonseed. A cask of seed was brought from the West Indies and presented to the Society of Arts, London, England, then engaged, as ever since, in the encouragement of arts, manufactures, and commerce.[4/]

It seems that the society was impressed by the potential possibilities of the seed as a source of a desirable vegetable oil and as a meal for cattle feed offered prizes to any individual who would successfully procure from the seed a given quantity of the by-products.[5/]

3/ Cotton Statistics and Related Data for Agricultural Workers. Op. cit.

4/ Robert S. Curtis, Cottonseed Meal Origin, History, Research, 1938, pp. 15-21.

5/ Ibid. p. 21.

The offer made by the Society is as follows:

> The Society being informed that a considerable quantity of oil can be obtained from the seed of cotton, and that after the expression of the oil, the remaining cake will afford a strong harty food for cattle, and likewise that the operation can be applied to the mill for cane sugar, and worked in the rainy season, at a moderate expense, have resolved, for the foregoing reasons, that the procuring of oil from the seed of cotton is the proper object of a premium, considered as an encouragement for planters to extend the cultivation of cotton, as an article essentially requisite to increase the manufacture of that commodity in this country---(England).

It is significant that the Society not only wished to obtain the by-products of the seed, but they considered that a market for the seed would encourage planters to extend the area of cotton cultivation which was needed to increase textile manufacturing in England at that time. The above offer was made to planters in the West Indies and did not apply to the rebellious colonies on the continent of America. Curtis states that no one ever came forth to claim the prize and seemed to think the quantity to be produced probably defeated any attempt.

After the unsuccessful efforts of the Society of Arts, Manufactures and Commerce to encourage the cottonseed processing industry the subject was almost forgotten for a generation. The first mill to successfully express oil from seed was erected and operated in 1826 at Columbia, South Carolina by Benjamin Waring.[6/] Numerous attempts were made during the next forty years some of which were partially successful but most of them were financial failures.

The Growth and Development of the Cottonseed Industry

Fortunately, not all attempts were failures, and in 1860 there were seven establishments for the processing of cottonseed in the United

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6/ Cottonseed and Its Products, United States Department of Agriculture Farmers Bulletin No. 36.

States.[7] Evidently the industry was not only retarded during the Civil War in the South but retracted for there were only four mills in the South in 1867. The industry eventually recovered its former status and continued to expand. The Census of Manufactures for 1870 and 1880 enumerates 26 and 45 mills, respectively, for these years. But it was only after the latter date that the cottonseed industry began a program of expansion which resembles the industry today. The next two decades saw an increase of approximately 310 percent in the number of establishments, but the greatest increase was from 1900 to 1905 when the number of establishments increased from 369 to 715.[8]

The phenomenal increase in the number of plants was probably due to an increase of the number of small establishments in the interior after the construction of railroads. The number of tons of cottonseed crushed did not increase in the same proportion as the number of plants, as the value of products did not increase in the same proportion to the number of plants. The value of all products was 19 million dollars in 1890, 59 million in 1900, and 96 million dollars in 1905. A large share of the relative decrease in the value of all products manufactured from cottonseed can be attributed to a decrease in the price level of the by-products of cottonseed.[9] Cottonseed meal was valued at $31.33 in 1875 but only $20.42 in 1905. In the meantime cottonseed oil prices decreased from six cents to three cents. The reduction in price may

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7/ Census of Manufactures, 1860, United States Department of Interior, Bureau of Census, p. 739.

8/ Census of Manufactures, Part III, 1905, United States Department of Commerce and Labor, Bureau of Census, pp. 538-539.

9/ Bulletin No. 164, Bureau of Census, Department of Commerce, pp. 68-69.

have been the result of improvement in the technique of manufacturing. In all probability increased production forced the oil into new markets where it had to compete with cheaply produced vegetable oil. Prior to this time its chief competition in the market was from lard.

A short description of the development of the industry would be incomplete without a discussion of the integration of the industry. As early as 1891 the report of the American Cotton Oil Company shows that with a capital of $33,761,700 this company owned 72 cotton-oil mills, 15 refineries, four lard and cottelene plants, nine soap factories, 15 cotton gins, three cotton compresses, two fertilizer mixing plants; one ocean tank steamer, 335 oil-tank cars, 23 box cars, and one barrel car in addition to products in inventory and real estate. 10/ The integration of the industrial organization has continued, but probably not to the same extent as was reported by the American Cotton Oil Company. A report of the Federal Trade Commission relative to charges of conspiracy in Restraint of Trade or of Unfair Practices, March 5, 1928, shows that chains of mills were operated by the following companies: Southern Cotton Oil Company, 49 mills; National Cottonseed Product Corporation, 19 mills, Buckeye Cotton Oil Company (Proctor and Gamble Company), nine mills; Choctaw Cotton Oil Company, 11 mills; Chickasha Cotton Oil Company, eight mills; Southland Cotton Oil Company, nine mills; International Vegetable Oil Company, six mills; and Swift and Company, five mills. No mention was made of related industries controlled by these companies.

This analytic industry which takes one raw product and converts it into several so-called by-products is confronted with the problem of marketing not only one product but many some of which can be sold directly

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10/ Cottonseed and Its Products, United States Department of Agriculture Farmers Bulletin No. 36, p. 8.

to the consumer without very much additional effort. But the oil is still in a crude state and requires refining before it is suitable for the majority of its uses. The ratio between the values of the by-products, cottonseed oil and meal, which are the principal products from the standpoint of value, shifts from season to season, but the general relationship between the value of oil and meal of two to one predominates. There have been irregular fluctuations in this ratio. For instance, in 1897, 1898, and 1899, the aggregate value of the meal was worth more than the oil. This also occurred again in 1906 which was a result of a sharp decline in oil prices and almost a stationary price level for meal. (Table 3).

The growth of the industry after being economically established depended indirectly upon industry to furnish machinery capable of recovering a large percentage of the recoverable by-products. This was not possible when machinery adapted to other uses was used such as the mill for sugar cane as advocated by the Society of Arts, Manufactures, and Commerce for the planters of the West Indies. Cottonseed oil milling although seasonal in nature did not develop as an employer of labor during the rainy or slack season on the cotton and sugar plantations as the Society had hoped.

A Comparison of the Early Industry and the Industry Today

A letter addressed to the Editor of the Cotton Oil Press, April 11, 1927 by Henry J. Parrish, Manager of the Gayso Oil Mill, Memphis, Tennessee tells some of the difficulties encountered by the industry. 11/

11/ The Cotton Oil Press, Vol. XI, Memphis, Tennessee, May, 1927, p. 23. See Appendix.

Table 3. COMPARATIVE DATA FOR THE COTTONSEED INDUSTRY

Estimated Quantity of Cottonseed Crushed, Quantities and Estimated Values of Crude Products Obtained, and Exports of Cottonseed Products, United States, 1875-1938

Year	Cottonseed				Crude Cottonseed Products								Exports	
					Oil		Cake and Meal		Hulls		Linters		Cottonseed	
	Produced (Tons) 1/	Crushed (Tons)	Percent Crushed	Total Value (000 Dollars)	Quantity (000 Pounds)	Value (Dollars)	Quantity (000 Tons)	Value (Dollars)	Quantity (Tons)	Value (Dollars)	Quantity (Bales)	Value (Dollars)	Oil (Pounds)	Cake and Meal (Tons)
1938	8,426	6,525	75.0	212	1,961	121,510	2,830	62,843	1,626	8,917	1,471	18,927	7,806	88
1937	5,511	4,498	81.6	229	1,364	123,189	2,031	65,785	1,144	10,472	1,127	29,739	3,315	4
1936	4,729	3,817	80.7	167	1,164	101,454	1,739	38,755	988	6,568	876	20,970	3,571	10
1935	4,282	3,550	82.9	178	1,109	91,849	1,614	54,023	913	10,260	805	21,606	5,495	3
1934	5,803	4,157	71.6	112	1,303	48,409	1,889	59,515	1,103	7,513	801	16,490	23,189	74
1933	5,782	4,621	79.9	87	1,446	47,234	2,093	29,467	1,512	4,681	741	5,931	44,427	151
1932	7,602	5,328	70.1	103	1,694	57,546	2,401	33,071	1,511	5,237	876	6,694	41,038	215
1931	6,191	4,715	76.1	170	1,442	91,658	2,165	58,623	1,304	10,474	824	8,969	26,353	44
1930	6,590	5,016	76.1	229	1,572	114,892	2,232	82,296	1,384	12,103	1,038	20,149	31,998	170
1929	6,435	5,061	78.6	265	1,604	133,906	2,282	90,706	1,368	12,842	1,086	27,793	29,531	286
1928	5,758	4,654	80.8	248	1,477	132,372	2,093	80,582	1,320	9,995	875	24,878	61,470	332
1927	7,989	6,306	78.9	240	1,888	142,242	2,840	72,476	1,854	8,882	1,041	16,684	57,580	495
1926	7,150	5,558	77.9	256	1,617	138,652	2,597	81,508	1,547	12,649	1,044	23,218	63,230	358
1925	6,051	4,605	76.1	241	1,404	126,665	2,126	79,173	1,351	15,749	858	21,268	53,261	443
1924	4,502	3,308	73.5	182	980	88,093	1,518	59,300	941	12,757	640	22,007	39,418	125
1923	4,536	3,241	74.8	173	1,003	84,818	1,487	59,037	944	12,200	591	17,199	64,292	227
1922	3,531	3,008	85.2	137	950	71,508	1,355	49,898	937	8,949	382	6,619	91,615	266
1921	5,971	4,069	68.1	157	1,309	84,650	1,786	58,298	1,256	10,059	429	3,506	283,268	227
1920	5,074	4,013	79.1	352	1,211	209,668	1,817	119,039	1,143	11,095	595	12,336	159,400	225
1919	5,360	4,478	83.6	384	1,325	227,316	2,170	116,119	1,137	17,917	910	22,228	178,710	156
1918	5,040	4,252	84.4	361	1,312	217,902	2,068	97,352	996	18,878	1,096	26,604	100,780	22
1917	5,113	4,479	87.6	287	1,408	153,419	2,225	74,586	969	13,994	1,300	45,193	158,986	575
1916	4,992	4,202	84.2	180	1,253	87,940	1,923	53,860	1,220	12,340	945	26,120	266,512	529
1915	7,186	5,780	80.4	153	1,719	80,540	2,648	57,740	1,677	8,450	832	6,150	318,367	740
1914	6,305	4,484	76.9	160	1,450	81,020	2,220	59,810	1,400	11,210	651	7,630	192,965	400
1913	6,104	4,579	75.0	132	1,393	69,100	1,999	45,970	1,540	9,710	602	7,450	315,233	564
1912	6,997	4,921	70.3	131	1,512	66,580	2,151	49,720	1,642	9,890	556	5,150	399,471	647
1911	5,175	4,106	79.3	143	1,260	80,430	1,792	44,660	1,375	11,370	398	6,250	225,521	402
1910	4,462	3,269	73.3	106	982	55,230	1,326	35,910	1,289	9,810	313	4,770	223,955	320
1909	5,904	3,670	62.2	86	1,101	44,090	1,492	33,580	1,330	6,080	346	2,340	383,155	875
1908	4,952	2,565	51.8	66	773	33,390	1,043	23,300	927	6,370	268	2,920	307,650	466
1907	5,913	3,844	65.0	94	1,153	43,050	1,563	39,140	1,395	8,840	322	3,350	314,102	670
1906	5,060	3,131	61.9	65	943	26,400	1,272	29,250	1,135	5,110	230	4,190	328,451	555
1905	6,427	3,345	52.0	69	1,004	31,340	1,360	27,770	1,213	5,590	246	4,610	386,517	626

Table 3. (Continued) COMPARATIVE DATA FOR THE COTTONSEED INDUSTRY

Estimated Quantity of Cottonseed Crushed, Quantities and Estimated Values of Crude Products Obtained, and Exports of Cottonseed Products, United States, 1875-1938

Year	Cottonseed				Crude Cottonseed Products								Exports	
					Oil		Cake and Meal		Hulls		Linters		Cottonseed	
	Produced (Tons) 1/	Crushed (Tons)	Percent Crushed	Total Value (000 Dollars)	Quantity (000 Pounds)	Value (Dollars)	Quantity (000 Tons)	Value (Dollars)	Quantity (Tons)	Value (Dollars)	Quantity (Bales)	Value (Dollars)	Oil (Pounds)	Cake and Meal (Tons)
1904	4,716	3,241	68.7	74	914	39,000	1,156	24,840	1,528	5,710	196	3,380	217,603	410
1903	5,092	3,269	64.2	71	922	40,560	1,165	23,310	1,541	5,390	196	2,030	267,322	550
1902	4,630	3,154	68.1	63	890	33,210	1,125	21,930	1,487	6,320	166	1,520	247,821	525
1901	4,830	2,415	50.0	48	725	26,080	845	16,270	1,139	3,990	143	1,890	370,176	629
1900	4,668	2,479	53.1	42	700	21,390	884	16,030	1,169	3,190	115	1,800	351,768	572
1899	5,472	2,353	43.0	28	706	13,180	823	14,780					379,704	540
1898	5,253	2,101	40.0	27	630	12,610	735	14,070					301,731	460
1897	4,070	1,628	40.0	26	488	11,720	570	14,540					203,992	312
1896	3,416	1,435	42.0	20	430	11,480	502	8,700					145,844	202
1895	4,792	1,677	35.0	25	503	13,420	587	11,450					158,908	245
1894	3,579	1,431	50.0	28	429	16,600	501	11,900					112,187	
1893	3,183	1,050	33.0	19	315	10,080	368	8,550					70,966	
1892	4,274	1,068	25.0	21	321	11,540	374	8,980					103,945	
1891	4,093	1,023	25.0	20	307	11,460	358	8,330					82,524	
1890	3,495	874	25.0	16	262	10,130	306	6,270					100,383	
1889	3,310	794	24.0	20	238	13,980	278	6,390					20,180	
1888	3,291	823	25.0	17	247	11,520	288	5,610					33,439	
1887	3,018	694	23.0	13	208	8,050	243	4,770					30,504	
1886	3,045	578	19.0	11	174	6,710	202	4,260					46,801	
1885	2,625	499	19.0	10	150	6,980	174	3,490					47,732	
1884	2,639	396	15.0	10	119	6,020	138	3,830					27,045	
1883	3,266	392	12.0	11	118	7,060	137	3,580					3,117	
1882	2,455	295	12.0	8	88	5,420	103	2,960					5,352	
1881	3,039	182	6.0	5	55	2,770	64	1,840					25,830	
1880	2,616	235	9.0	6	71	3,670	82	1,970					52,483	
1879	2,268	181	8.0	4	54	2,400	64	1,410					40,144	
1878	2,148	150	7.0	4	45	2,650	53	1,260					37,443	
1877	1,969	98	5.0	3	30	1,770	34	840					12,791	
1876	2,057	123	6.0	4	37	2,670	43	1,300					2,108	
1875	1,687	84	5.0	3	25	1,590	30	940					3,130	

SOURCE: Cotton Production and Distribution, Bulletins No. 164 to 176, Bureau of Census, United States Department of Commerce.

1/ Relates to crop of preceding year.

Mr. Parrish's letter pertains to the eighties when the lack of standard gauge for railroads made transportation difficult. He estimated that one-third of the seed was moved by each of the principal modes of transportation--water, rail, and by wagon. The seed cost the mills about $12.00 per ton delivered. All oil had to be barrelled as tank cars were not generally used. Mention is made of the first tank cars which were shipped by N. K. Fairbanks Company in 1884. The company had the tanks branded "Garden City Dairy Company of Chicago."

Concerning the efficiency of the industry in 1881, Mr. Parrish wrote:

> The average yield of oil was from 38 to 39 gallons (285 to 292.5 pounds). The average meal per ton was about 760 pounds, and the lint from a ton of seed was anywhere from 15 to 25 pounds. This lint was a very fair staple and brought anywhere from 6½ to 8 cents per pound, in fact, nearly as much as hill staple cotton (American Up-land). The ashes from the hulls were sold at approximately $20.00 per ton but there was seldom a mill ever made over a carload a season, and at that time a mill that received 7,000 or 8,000 tons seed a season, had a very nice crush. Seed that were received from the river, the mills furnished the sacks and they were under their own brand, and no mill would take each others sacks!
>
> There was a great loss in these sacks as the mills in those days bought a double selvage gunny bag that cost 27 cents each and as the sacks were furnished free, the loss was about 35 per cent a season. The farmers used them for whatever needs they might require, making back bands, saddle blankets, chicken coops and some of the darkies used them for coats.

The above is primarily of interest when used to compare the efficiency in the manufacturing of cottonseed by-products in 1881 and 1938, whereas only 38 and 39 gallons of oil were recovered (285 and 292 pounds) in 1881, the average for the United States in 1938 was 310 pounds. Equally as great improvements were made in the amounts secured of cake or meal, hulls, and linters. In 1938 the United States average was 895 pounds of meal, 514 pounds of hulls and 144 pounds of

linters.[12] The increase in linters cut from the seed is not a result of higher prices for linters but of efforts to increase the amount of oil recovered from the seed.[13] When additional amounts of linters are cut from the seed the quality of linters decreases and if it were not for the fact that well linted seed makes for economical mill operation it is probable that "first cuts" only would be produced. When prices for the "first cuts"[14] in 1938 are compared with prices of linters in 1881 it is found that 1938 prices are considerably lower. The average for the year 1938 was 3.96 cents per pound.

The cottonseed hulls are no longer burned and the ashes sold as fertilizer but are used as a feed roughage and compete in price with the cheaper grades of hay. In 1883 feeding experiments were reported conducted in mills in the vicinity of Memphis, New Orleans, Houston, and Little Rock to ascertain the feeding value in hulls.[15] However, in 1896 they were still used as a fuel and the ashes later sold as fertilizer.

The value of hulls was dependent upon their utility as a fuel. Compared to a ton of hulls a cord of wood has two and one-half times the fuel value and four and one-third tons of hulls are equal to one ton of coal.[16] If coal sold at $3.50 a ton and wood at $2.00 hulls

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12/ Cotton Production and Distribution, 1939, Bulletin No. 177, Bureau of Census, p. 47.

13/ Curtis, Op. cit. p. 88.

14/ Grade one or first cuts is commonly referred to as "spinnable linters."

15/ Cottonseed and Its Products, United States Department of Agriculture Farmers Bulletin No. 39, pp. 3-4.

16/ Hammond, Op. cit. p. 370.

would sell at 80 to 90 cents a ton. Because of the abundance of other types of fuel close at hand, mills reporting to the Census Bureau in 1890 complained of their customers' shortsightness in refusing to haul the hulls away from the mills even though hulls were offered to them free. Hammond reports that the disposal of the hulls was an additional expense to mills. They were forced to engage some one to haul them to vacant lots where they became a source of irritation to people who practiced grazing cows on these lots.

The general public learned of the feeding value of hulls as their stock ate the hulls without suffering ill effects. In regard to the above, Hammond says, that as the blockade of the New Orleans port during the Civil War rendered "forage with all other supplies very scarce, the cattle were allowed, cautiously, to gratify their predilections for the hulls, and no injury resulting, hulls become a staple stock feed."[17/]

The use of hulls as feed increased very slowly. Of the mills reporting to the Census in 1880, 16 of the 45 established reported selling hulls for feed. An Englishman's report on the oil industry in America in 1887 gives the hulls as waste, but Hammond adds that a "little anterior to the date of the report---mills could not supply the demand." It seems that the mills were pricing the hulls on the basis of fuel value otherwise the demand would not have been so insatiable.

Summary

Cottonseed was a waste product prior to 1860, a fertilizer until 1880, but has been a source of animal and human food ever since. It became a valuable commercial product after a demand had been created for

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17/ Hammond, Op. cit. p. 366.

its component by-products. The processing of these products involved many risks to the early enterpriser as the general public was not aware of the uses of cottonseed and its by-products. Methods and techniques of manufacturing, however, were developed or known long before any attempt was made to process the cottonseed.

The value of the raw cottonseed prior to the beginning of the crushing industry was determined by the demand for planting seed. Later the by-products of the cottonseed were valued on the basis of the fertilizer constituents and use as a fuel. The third and final value relationship was established when the meal was used as a protein supplement in feeding rations, the oil as the principal ingredient in compounds, the linters as a source of cellulose, and hulls as a roughage for livestock.

CHAPTER III. PRODUCERS' MARKETS FOR COTTONSEED IN OKLAHOMA

The producers' markets for cottonseed in Oklahoma are the local gins serving the territory, which buy almost all of the seed sold by the producers. Cottonseed oil mill superintendents, in response to a questionnaire, estimated the amount purchased direct from producers to be less than one-tenth of one percent. This small amount is the remainder of the planting seed not needed to plant the current crop. However, the distance to the cottonseed mills limits the extent of this market, and the seed is generally fed to livestock if adequate storage is not available to keep the seed for the next crop.

Factors Affecting Storage of Seed on Farms

Storage of cottonseed on the average farm is not feasible because of the bulkiness of the seed. Compared to the requirement for wheat storage of 1 2/3 cubic feet per 100 pounds, cottonseed requires 3 3/4 cubic feet; consequently, very little seed is stored for future sale except by those producers who produce planting seed for sale in the spring. (Table 4). The value of cottonseed inventory, on farms on January 1 in Oklahoma, expressed as a percentage of seed sales varied from 25.3 percent in 1920 to as low as one-tenth of one percent in 1922. However, these are exceptional cases as the average for the periods 1909 to 1919 and 1920 to 1929 were 7.3 and 9.8 percent, respectively, while the average value of the inventory expressed as a percentage of sales from 1930 to 1938 inclusive was only 6.0 percent. It is customary for producers to keep enough seed to plant the crop at least twice;

Table 4. Sales and Cash Income from Cottonseed, Quantity and Value of Cottonseed on Farms in Oklahoma, and Inventory January 1, Expressed as a Percentage of Sales of the Preceding Year, 1910-1938

Year	Cotton-seed Sold	Average Price Per Ton	Cash Income	Cottonseed Inventory, January 1			
				Quantity	Price Per Ton 1/	Value	Value of Cottonseed Inventory as Percent of Sales
	(1,000 Tons)	(Dollars)	(1,000 Dollars)	(1,000 Tons)	(Dollars)	(1,000 Dollars)	
1910	283	20.98	5,936	5.6	24.50	13,700	-
1911	255	15.86	4,052	7.4	20.80	154	2.6
1912	310	16.66	5,166	31.9	15.75	5,020	12.4
1913	227	20.40	4,629	16.8	17.90	301	5.8
1914	383	12.55	4,805	9.9	20.00	198	4.3
1915	246	27.83	6,838	47.0	14.10	663	13.8
1916	326	42.40	13,814	21.3	33.00	703	10.3
1917	322	61.77	19,878	5.6	51.00	286	2.1
1918	195	62.45	12,184	23.8	62.40	1,485	7.5
1919	273	60.91	16,610	13.7	61.00	836	6.9
1920	360	28.01	10,092	71.0	59.30	4,210	25.3
1921	250	21.45	5,367	100.6	17.00	1,710	16.9
1922	169	27.32	4,625	0.4	21.00	8	0.1
1923	150	38.65	5,809	1.2	38.00	46	1.0
1924	477	32.16	15,340	10.9	42.50	463	8.0
1925	566	29.58	16,754	31.9	32.50	1,037	7.8
1926	537	17.70	9,508	36.5	26.20	956	5.7
1927	457	30.49	13,940	128.3	14.40	1,848	19.4
1928	382	33.04	12,618	22.1	38.00	840	6.0
1929	360	31.13	11,194	29.2	35.00	1,022	8.1
1930	240	23.80	5,719	15.6	31.00	484	4.3
1931	324	8.57	2,779	5.3	22.00	117	2.0
1932	357	8.65	3,091	23.0	10.10	232	8.3
1933	354	10.36	3,666	10.7	7.60	81	2.6
1934	93	32.04	2,967	7.8	12.90	101	2.8
1935	162	30.04	4,875	5.2	38.00	198	7.7
1936	96	29.32	2,812	23.9	30.00	717	14.5
1937	266 2/	17.98	3,779	1.0	30.00	30	1.0
1938			3,355	23.1	18.00	416	11.0

SOURCE: Income Parity for Agriculture, Part I. Farm Income, Bureau of Agricultural Economics, Agricultural Adjustment Administration, United States Department of Agriculture

1/ Price, December 15 of preceding year.

2/ Preliminary.

therefore, if the requirement for planting were deducted little extra seed was actually stored by producers.

There is an inverse relationship between the price of seed and the amount held by producers each year. Following 1911 when the average price was $5.10 less than the price for the previous year, the amount on farms January 1, 1912, increased more than 300 percent over that held on farms January 1, 1911. The relationship was true for 1912, 1914, 1915, 1916, 1918, 1919, 1920, 1924, 1925, 1926, 1927, 1931, 1932, 1934, and 1935 when there was a decrease in the price trend from that of the previous years.[1/] (Table 4). With a very few exceptions when the price increased from the price of the previous season, the amount on farms was materially decreased January 1, the following year when compared to the previous inventory. The exceptions were generally found when there had been a downward trend for two years in succession. However, there may be other factors which might induce producers to hold additional seed, such as: anticipation of a high price for planting seed, which would cause a storage of seed to sell for planting the next season; preference of some producers to plant two year old seed who store more seed some years than others; and if producers are forced to plant several times one season, extra storage to keep an adequate supply for any emergency, especially if they were forced to pay a high price for seed to plant the current crop.

1/ Income Parity for Agriculture, Part I. Farm Income, Section I. Income from Cotton and Cottonseed, United States Department of of Agriculture, 1938, p. 36.

Seasonal Price Movement

There are definite seasonal movements of cottonseed prices. Three different seasonal movements of Oklahoma farm prices for cottonseed were constructed which are included in the Appendix, page 98. The first includes the years from 1927 to 1939. For this period of years, the high was in May when the seasonal stood at 105.1 percent and the low was in September when the seasonal price was 92.0 percent of the yearly trend. However, it rose to 95.3 in October and was more than 100 percent in November and December. The high seasonal price in May might be attributed to the higher price received by the producer for planting seed sold.

The other two seasonal movements were constructed by using selected years since 1910 when total production exceeded one million bales and for years when total production was less than one million bales. An examination of these two shows than in years when production exceeded one million bales the seasonal price fluctuated more irregularly than the seasonal price for the years 1927 to 1938 inclusive but there were the same general relationships. The month of May was high with 111.4 percent while the month of December was the low when the percentage was 85.4 percent, a spread of 26 percent as compared to a spread of only 15.1 percent for the 1927-1939 trend. The seasonal movement for the years when total production was less than one million bales moves opposite to the others as the month of November was high with 111.1 percent of the average for the year and the low month was August when prices were found to be 92.6 of the average or a spread of 18.5 percent.

The Effect of Fixed Ginning Rates on Cottonseed Prices

Cotton gins were declared public utilities in 1915 under Section 15, Article 9 of the Constitution of Oklahoma, and are licensed annually by the Corporation Commission to gin seed cotton at a predetermined rate per hundred pounds.[2/] These rates are prescribed annually by the Commission immediately following a hearing early in September. Interested parties may appear before the Commission and present data relative to the desirability of the rate which they might wish to have enacted. The Commission after examining the data presented and a careful study of the earnings of the ginning industry, ascertained from annual reports to the Commission by the gins, set the rate for ginning seed cotton and the charges that can be made for bagging and ties.[3/]

Although, it is not the purpose of this study to analyze the effects of the rates which are fixed by the Corporation Commission in a study of the primary markets for cottonseed, the rate fixed by the Croporation Commission must be considered as a factor indirectly affecting the price paid by the gin for cottonseed.[4/] If the rate fixed by the Commission for any reason were in excess of the rate required to return to the gins an ample rate upon the capital invested, the gins through competitive buying of cotton and cottonseed may pay more for

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2/ C. O. Bunn, Compiled Statutes of Oklahoma, 1921, Annotated, 1922. Bunn Publishing Company, pp. 1613-1614.

3/ Supplement, Session Laws, 1923, 1924, 1925. Compiled Oklahoma Statutes, 1926, pp. 249-250.

4/ R. C. Soxman, A Business Analysis of Cotton Gins in Oklahoma, Unpublished Master's thesis, Oklahoma Agricultural and Mechanical College, Stillwater, 1935.

these products than they can be resold for.[5] Mr. Soxman says in part: ". . . there can be no assurance that competitive inducements to gin cotton at a particular plant will not be offered farmers in the form of high prices for their cotton or cottonseed." The ginning rate in Oklahoma since 1927 has varied between years and between the eastern western sections[6] of the State. These rates have not always equaled the competitive rate in sections of the adjoining states.[7] As a result some seasons have been very remunerative for the industry as a whole.[8] In 1929, 822 gins had an average net income from ginning revenue of $1.98 a bale, while 850 gins in 1930, 816 gins in 1931, and 771 gins in 1932 had a net ginning revenue of $1.72, $1.70, and $1.76 per bale, respectively. However, this does not present a clear illustration of that which actually existed. Five hundred and fifty-seven of these gins made an operating profit of $2.51 per bale and 265 had a net operating loss of $1.65 per bale. The majority of the gins operating at a loss were located in the eastern section where 221 gins had a loss of $1.76 per bale and only 44 gins in the western section lost an average of $1.35 per bale.[9] It should be pointed out that a net operating profit does not necessarily imply that the gins in all cases yielded a profit on the capital invested. It would be possible for the gins in a short active ginning season to operate at a net profit per bale but return a negative rate on the investment. However, volume ginned

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5/ Soxman. Op. cit. p. 27.

6/ This was an arbitrary division of the State by the Corporation Commission. The boundary line was the western boundary of Logan, Oklahoma, Cleveland, McClain, Garvin, and Carter counties which extend across the State.

7/ Soxman. Op. cit. pp. 46-51.

8/ Ibid. pp. 99-144.

9/ Ibid. p. 138.

is directly correlated with the earnings of the industry,[10] but the net operating revenue per bale would be influenced more by the capacity at which the gin operated and length of ginning season.[11]

Therefore, since gins can compete through competitive buying of lint cotton and cottonseed, some consideration should be given to the policies of the gins in purchasing these two products.

Comparison of Gin Returns from Marketing Cottonseed and Cotton Lint

The Farm Credit Administration in a study of 231 cooperative gins in Texas and Oklahoma for the year 1936 found that on the average these gins lost 49 cents on each bale purchased and made a net profit of $4.60 per ton of seed.[12] It appears that these gins practiced paying more for their cotton than it can be sold for but merchandized the seed at a profit. These same gins made an average profit of 43 cents per bale from ginning revenue operation. Because the value of the lint is greater in relation to the seed the producers are concerned more with what they can sell the lint for than they are for the price paid for seed.

The amount of cotton purchased by the gins studied by the Farm Credit Administration differed for each individual plant, and ranged from zero to more than 100 percent of total ginnings. Ginners on the average purchased 49.8 percent of total ginning in 1929. In 1932 gin purchases increased to 72.7 percent and the average for the period

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10/ Soxman. Op. cit. pp. 129-144.

11/ Joe Harvey Miller, An Economic Analysis of the Ginning Industry in Oklahoma, 1928-1939, Unpublished Thesis, Oklahoma Agricultural and Mechanical College, Stillwater, 1935.

12/ Schedules taken in cooperation with the Oklahoma Agricultural and and Mechanical College and the Texas Experiment Station. Unpublished data.

1929-1932 was 63.5.[13/] The increase was greater in western Oklahoma than in the eastern section.

The tendency of the gins to pay more for the cotton than it can be sold for results in enormous losses by some of these plants. In an analysis of the cotton account of 94 cooperative gins in Oklahoma in 1936 by the Farm Credit Administration, 46 gins merchandized cotton at a loss and 40 gins made a profit on the cotton sold. Twenty-eight of these gins lost from one cent to one dollar per bale, 12 gins lost from one dollar to two dollars, three gins lost from two dollars to three dollars, and five gins lost more than five dollars per bale purchased. Fortunately, the five gins purchased on the average only 41 bales, and the total loss was not so great. One gin suffered a loss of $8.79 per bale on 65 bales. The greatest total losses were made by six gins in the classification of one to two dollars loss per bale. These six gins purchased and sold from 1,087 bales to 1,786 bales; the total loss ranged from $1,121 to $3,074. The cotton purchases of the six gins ranged from 76.2 to 96.9 percent of total ginnings. Four of these gins purchased more than 90 percent of total ginnings. This should not be construed to mean that purchase of a high percentage of ginning usually results in a loss. Nine of the 94 gins included within the study made a gross profit on their cotton accounts of from $1,042 to $2,995. The gin making the largest gross profit on cotton purchased 78.4 percent; one other gin purchased 74.2 while the remainder purchased over 90 percent. The highest percentage for a gin was 96.2 percent of total ginnings. Only two gins made over two thousand dollars.

13/ Soxman. Op. cit. p. 163.

Two of the six gins that lost over a thousand dollars buying cotton made very wide margins per ton on seed sold; however, they had a negative ginning revenue. It seems that managers were attempting to recoup losses in ginning and cotton accounts by widening seed margins. This could be done in either one of two ways, decreasing prices paid to producers, or receiving more for seed from mills. This group had very high margins on seed while seven of the nine had a net ginning loss.

Of the 94 cooperative gins in Oklahoma only seven did not purchase cotton. The seed margins from smallest to greatest were $2.82, $4.28, $5.41, $5.51, $7.31, and $9.03. The net ginning revenues respectively were -$6.32, +$0.60, -$1.53, -$1.54, -$2.43, -$1.64, and -$0.19. There may have been some attempt to make up losses in ginning by raising gin margins on seed, but this does not appear to be true for the lowest margins are associated with largest losses.

An analysis of margins in seed (mill prices to gins less gin price to farmers) of the entire 94 cooperative gins shows that, in a frequency distribution 13 of the gins made less than $3.00. This may appear to be significant as handling cost plus shrinkage at gins are considered to be approximately $3.00 per ton, but these margins are net in that seed is sold f. o. b., and shrinkage is insignificant. The modal classification was from $3.00 to $5.99 which included 52 of the 94 gins. There were four gins in the classification immediately higher and four gins netted better than nine dollars per ton on seed sold. The remaining one gin making a profit netted better than $12.00, but the seed was sold for planting purposes.

A more normal distribution is obtained when the $2.00 class interval is used. The modal class was from $4.00 to $6.00 which

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included 39 gins. The classification just below and above the modal class had 24 gins each. It seems that these gins as a whole received a net return of $4.00 or more for seed purchased.

Of the 94 gins, 41 lost by purchasing cotton, 48 made a profit, some times very small, and total losses over-balanced profits for all gins. The net operating revenue of 65 of these gins was minus, and it was more closely associated with volume ginned than with marketing activities.

Summary

The producers' markets for cottonseed in Oklahoma are the local gins serving the territory. Producers market at the time of ginning approximately all of the crop marketed. But the percentage of total crop produced which is marketed any particular year is closely related to price relationships of past seasons. If there has been a sharp decrease in price from the preceding year the amount stored on farms tends to increase; and inventory is decreased of January 1, if there has been an increase in price over the past season.

The seasonal movement of prices in Oklahoma based on the years 1927-1939 corresponds very closely to a seasonal based on the years when production averaged less than one million bales. The low of the seasonal movement was in months of most active ginning.

Gins on the average retain a spread of three to five dollars a ton between the farm price and the mill price. But on the average gins have a loss in their cotton accounts from merchandizing cotton. Gins buy almost 100 percent of the seed, but this is not true with cotton lint. However, no direct relationship was found between the volume purchased either of cotton or cottonseed and the profits or losses per unit.

CHAPTER IV. FARM PRICES FOR COTTONSEED IN SOUTHWESTERN OKLAHOMA, SEASONS 1937 AND 1938

In an analysis of farm prices for cottonseed purchased by the ginners in the seasons, 1937-38 and 1938-39, two methods were used. The first was the weighted average weekly price and the second was the range in prices each week. This analysis was made on the basis of the two separate divisions, southern and northern counties.[1/] A study of the prices paid during the season 1937-38 revealed two significant things. First, the average farm prices in the southern counties were higher than prices in the northern counties. Second, the general movement of prices throughout the season was almost identical.

The Average, High, Low, and Spread in Gin Prices For the Two Groups

The average price of the southern counties was never as high as that reached in the northern counties. This may appear paradoxical for it was stated that as a whole, prices were higher in the southern counties. An examination of the Charts I and II reveals that the average price in the northern counties at the beginning of the season, August 2 through August 8, was $25.00, while in the southern counties for the same week the price was only $22.25. The $25.00 was the high for all points in either group during the season. But the average price in the southern counties throughout the season was materially higher

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1/ Northern Counties: Beckham, Blaine, Caddo, Canadian, Custer, Dewey, Garvin, Grady, McClain, Murray, Washita, and Roger Mills.

Southern Counties: Comanche, Cotton, Greer, Jackson, Jefferson, Kiowa, Stephens, Tillman, and Harmon.

CHART I

RANGE IN PRICE PAID FARMERS AND GINNERS IN SOUTHERN COUNTIES FOR COTTONSEED, BY WEEK, (SEASON 1937-8)

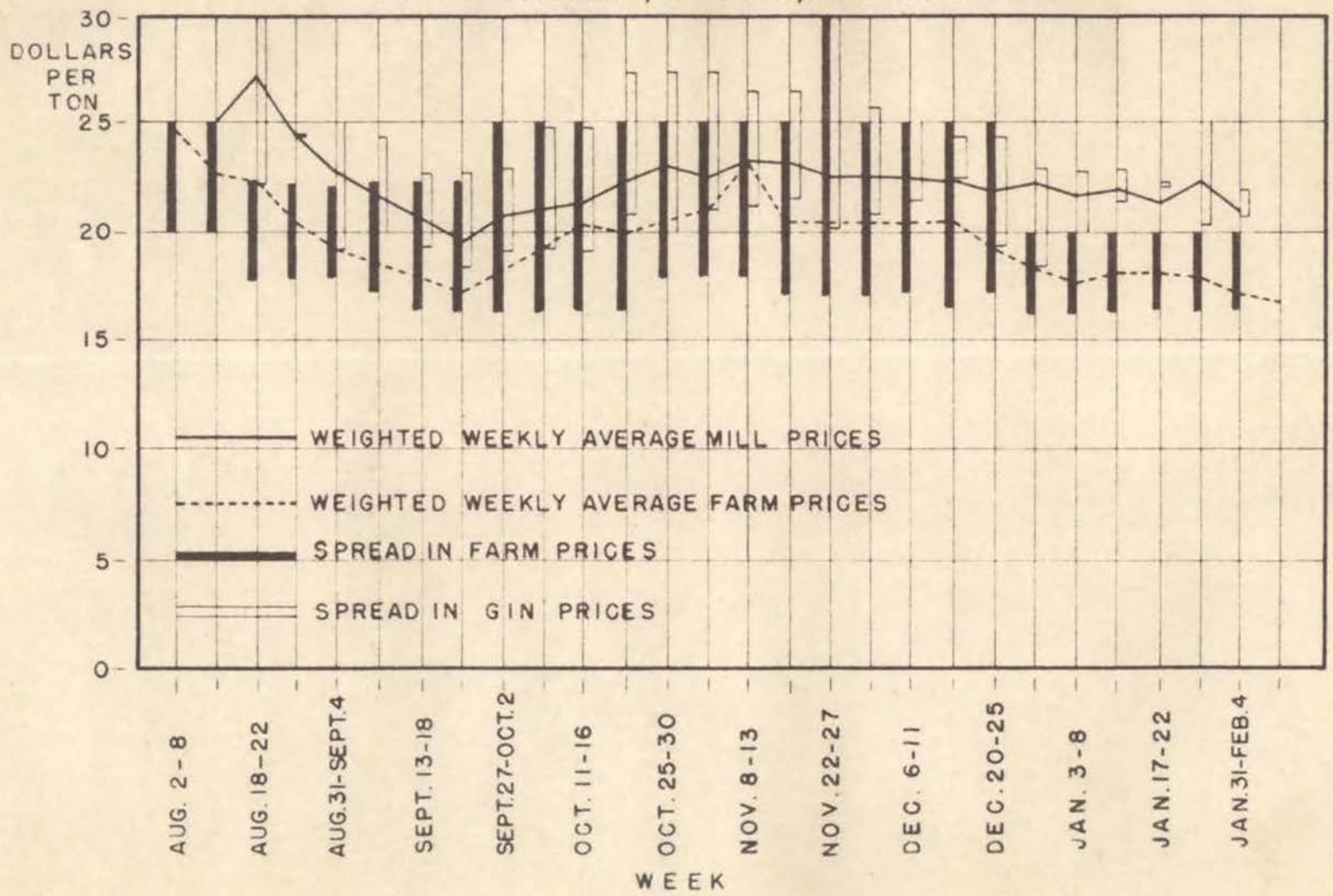
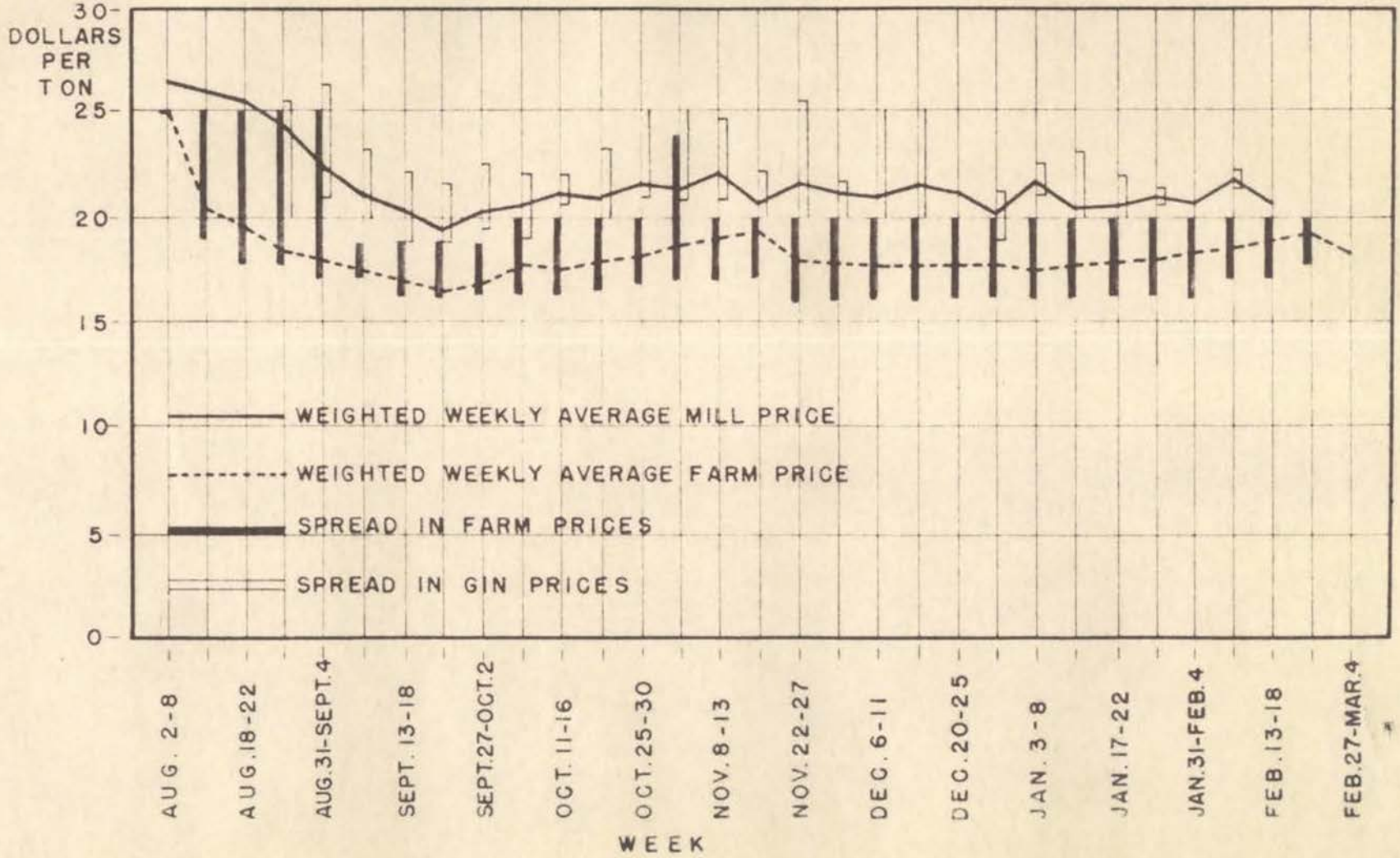


CHART III

RANGE IN PRICE PAID FARMERS AND GINNERS IN NORTHERN COUNTIES FOR COTTONSEED, BY WEEK, (SEASON 1937-8)



than that in the northern counties the remainder of the season. This resulted in a greater net return to producers in the southern group as compared to producers in the northern group. Although the range in prices was greater, the lower extremity of the range in the southern counties was never below that of the northern counties (Tables 5 and 6) except for the period August 2 to September 14. The range in the northern group narrowed relative to prices in the southern group for this period. Measured in absolute quantities, the high spread was $8.00 for the northern group and only $5.00 in the southern group.

Immediately following the week ending September 4, 1937-38, this relationship was reversed, and thereafter, the range of gin prices in the northern group decreased materially relative to the range in the southern group. (Charts I and II). It is significant that the range in gin prices in the northern group decreased to $2.00 following the week ending September 4, when the high was set for the season. The $2.00 was the low for the season for either group. The range in prices paid by gins in the northern group was well below the high of $8.00 thereafter, and never exceeded $4.00 except for the week ending November 6 when the spread was $7.00. As the spread never decreased to less than $3.00 after the week ending September 11 and as $4.00 was the maximum, there was a tendency for prices to remain fairly stable. The average price tended to verify the above contention.

The spread in prices paid by gins in the southern group increased rather sharply after the week ending September 4. This was caused by a decrease in the prices paid at some gins. Table shows that the high remained the same, $22.00, while the low fell to $16.00. Evidently most of the cottonseed was affected by the decrease in price for the average price decreased, however, not in the same proportion.

Table 5. The High, Low, Spread, and Weekly Average Farm and Oil Prices for Cottonseed; Also Gin Margins in the Southern Counties, Southwest Oklahoma, 1937-38

Week of	Farm Price Per Ton (Dollars)				Mill Price Per Ton (Dollars)				Gin Margin
	High	Low	Spread	Weighted Average	High	Low	Spread	Weighted Average	
Aug. 2-8	25.00	20.00	5.00	24.22	-	-	-	-	-
Aug. 10-16	25.00	20.00	5.00	22.87	25.00	25.00	-	25.00	2.13
Aug. 18-22	22.00	18.00	4.00	22.05	30.00	22.25	7.75	27.44	5.39
Aug. 24-29	22.00	18.00	4.00	20.39	24.45	24.25	0.20	24.33	3.94
Aug. 31-Sept. 4	22.00	18.00	4.00	19.08	25.00	19.00	6.00	22.65	3.57
Sept. 6-11	22.00	17.00	5.00	18.25	24.25	20.25	4.00	21.68	3.43
Sept. 13-18	22.00	16.00	6.00	17.69	22.70	19.00	3.70	20.80	3.11
Sept. 20-25	22.00	16.00	6.00	17.39	22.25	18.00	4.25	19.82	2.53
Sept. 27-Oct. 2	25.00	16.00	9.00	18.08	22.50	19.00	3.50	20.74	2.66
Oct. 4-9	25.00	16.00	9.00	19.45	24.25	19.25	5.00	21.45	2.00
Oct. 11-16	25.00	16.00	9.00	20.26	24.25	19.00	5.25	21.77	1.61
Oct. 18-23	25.00	16.00	9.00	20.06	27.25	21.00	6.25	22.39	2.33
Oct. 25-30	25.00	18.00	7.00	20.58	27.25	20.00	7.25	23.12	2.54
Nov. 1-6	25.00	18.00	7.00	21.19	27.25	21.00	6.25	22.78	1.59
Nov. 8-13	25.00	18.00	7.00	23.43	26.25	21.50	4.75	23.43	2.44
Nov. 15-20	25.00	17.00	8.00	20.66	26.25	22.00	4.25	23.18	2.52
Nov. 22-27	30.00	17.00	13.00	20.76	30.00	20.25	9.75	22.78	2.02
Nov. 29-Dec. 4	25.00	17.00	8.00	20.77	25.55	21.00	4.55	22.76	1.99
Dec. 6-11	25.00	17.00	8.00	20.74	25.00	21.50	4.50	22.55	1.81
Dec. 13-18	25.00	16.00	9.00	20.91	24.25	22.25	2.00	22.48	1.57
Dec. 20-25	25.00	17.00	8.00	19.16	24.25	19.10	5.15	21.98	2.82
Dec. 27-Jan. 1	20.00	16.00	4.00	18.75	23.00	18.65	4.35	22.10	3.35
Jan. 3-8	20.00	16.00	4.00	18.08	23.00	20.00	3.00	21.78	3.70
Jan. 10-15	20.00	16.00	4.00	18.20	23.00	21.50	1.50	21.98	3.78
Jan. 17-22	20.00	16.00	4.00	18.17	22.20	22.00	0.20	21.25	3.08
Jan. 24-29	20.00	16.00	4.00	18.02	25.00	20.50	4.50	22.50	4.48
Jan. 31-Feb. 4	20.00	16.00	4.00	17.39	22.00	21.00	1.00	21.16	3.77
Feb. 6-11	17.00	17.00	-	17.00	-	-	-	-	-
Feb. 13-18	-	-	-	-	-	-	-	-	-
Feb. 20-25	-	-	-	-	-	-	-	-	-
Feb. 27-Mar. 4	-	-	-	-	-	-	-	-	-

Southern Counties: Comanche, Cotton, Greer, Jackson, Jefferson, Kiowa, Stephens, Tillman, and Harmon.

Table 6 . The High, Low, Spread, and Weekly Average Farm and Oil Prices for Cottonseed; Also Gin Margins in the Northern Counties, Southwest Oklahoma, 1937-38

Week of	Farm Price Per Ton (Dollars)				Mill Price Per Ton (Dollars)				Gin Margin
	High	Low	Spread	Weighted Average	High	Low	Spread	Weighted Average	
Aug. 2-8	25.00	-	-	25.00	26.40	26.40	-	26.40	1.40
Aug. 10-16	25.00	19.00	6.00	20.33	-	-	-	-	-
Aug. 18-22	25.00	18.00	7.00	19.73	25.50	25.50	-	25.50	5.77
Aug. 24-29	25.00	18.00	7.00	18.64	25.50	20.00	5.50	24.27	5.63
Aug. 31-Sept. 4	25.00	17.00	8.00	18.08	26.40	21.00	5.40	22.44	4.36
Sept. 6-11	19.00	17.00	2.00	17.57	23.40	20.00	3.40	21.15	3.58
Sept. 13-18	19.00	16.00	3.00	16.71	22.00	19.00	3.00	20.12	3.41
Sept. 20-25	19.00	16.00	3.00	16.44	21.50	19.00	2.50	19.48	3.04
Sept. 27-Oct. 2	19.00	16.00	3.00	16.61	22.30	19.50	2.80	20.09	3.48
Oct. 4-9	20.00	16.00	4.00	17.73	22.00	19.00	3.00	20.59	2.86
Oct. 11-16	20.00	16.00	4.00	17.63	22.00	21.00	1.00	21.33	3.70
Oct. 18-23	20.00	16.00	4.00	17.91	23.40	20.00	3.40	21.22	3.31
Oct. 25-30	20.00	17.00	3.00	18.09	25.00	21.00	4.00	21.88	3.79
Nov. 1-6	24.00	17.00	7.00	18.70	25.00	21.00	4.00	21.56	2.86
Nov. 8-13	20.00	17.00	3.00	19.02	24.50	21.00	3.50	22.38	3.36
Nov. 15-20	20.00	17.00	3.00	19.25	22.00	20.00	2.00	20.71	1.46
Nov. 22-27	20.00	16.00	4.00	17.92	25.50	20.00	5.50	21.48	3.56
Nov. 29-Dec. 4	20.00	16.00	4.00	17.92	21.50	20.00	1.50	20.95	3.03
Dec. 6-11	20.00	16.00	4.00	17.87	25.00	20.00	5.00	20.88	3.01
Dec. 13-18	20.00	16.00	4.00	17.87	25.00	20.00	5.00	21.41	3.44
Dec. 20-25	20.00	16.00	4.00	17.84	21.00	21.00	-	21.00	3.16
Dec. 27-Jan. 1	20.00	16.00	4.00	17.85	21.00	19.00	8.00	20.06	2.21
Jan. 3-8	20.00	16.00	4.00	17.67	22.50	21.00	1.50	21.65	3.98
Jan. 10-15	20.00	16.00	4.00	17.85	23.00	20.00	3.00	20.20	2.35
Jan. 17-22	20.00	16.00	4.00	17.88	22.00	20.00	2.00	20.38	2.50
Jan. 24-29	20.00	16.00	4.00	17.91	21.00	20.50	0.50	20.76	2.85
Jan. 31-Feb. 4	20.00	16.00	4.00	17.98	20.50	20.50	-	20.50	2.52
Feb. 6-11	20.00	17.00	3.00	18.02	22.00	21.50	0.50	21.67	3.65
Feb. 13-18	20.00	17.00	3.00	18.16	20.50	20.50	-	20.50	2.34
Feb. 20-25	20.00	18.00	2.00	18.35	-	-	-	-	-
Feb. 27-Mar. 4	20.00	17.00	3.00	17.90	-	-	-	-	-

Northern Counties: Beckham, Blaine, Caddo, Canadian, Custer, Dewey, Garvin, Grady, McClain, Murray, Washita, Roger Mills.

The range in prices paid by gins in the southern counties increased again following the week ending September 25. This increase was caused, however, by an upward trend and not a decrease which was characteristic of the preceding period. A comparison of prices in the two areas (Tables 5 and 6) for the period September 27 to October 23 reveals that there was a $3.00 increase in the southern counties, but only a $1.00 increase in the northern counties. The low remained the same. This eventually resulted in a higher average price in the southern counties.

Another similarity of price relationship is of importance, in that in the period from the week ending October 2 to that ending December 25, the high remained at $25.00 except for one week. During this week, November 22 to November 27, the high for the gin prices was $30.00. This made a spread of $13.00 for the southern group. While the high in the southern counties was $25.00, the high in the northern counties was only $20.00, except for one week ending November 6. The northern counties maintained the high of $20.00 throughout the season except for the one exception. The high for the southern counties was reduced to $20.00 in the week of December 27 to January 1. This price existed the remainder of the season for both groups.

Two other similarities should be noted. First, the low for the northern group remained practically constant as compared to the southern counties. Second, the high in the northern counties was never equal to or exceeded the mill price. In the southern counties this was often the case.

Very likely the wide range in gin prices in the southern counties was in no small measure responsible for the higher average gin price.

This meant a higher farm price to producers in the southern counties.

Gin Prices in Relation to Mill Prices

Mill prices in this study were taken as the average of prices at which gins disposed of their seed to the cotton oil mills and in no instance do they represent price quotations by mills. Gins in the southern counties did not make any seed sales until the week ending August 16 at which time there was only one price prevailing. The first sale of seed by gins in the northern group was made a week earlier. This was unexpected as ginning is naturally later getting started in these counties. It is likely that this did not represent a spot seed sale but a short committment by some gin, as it was noted in an analysis of methods of sale that gins in the northern group were more inclined to sell short. Consequently, the price would be reflected as of that week.

For the week ending August 22, mill prices to gins in the southern counties ranged from $22.25 to $30.00 or a spread of $7.75. As gins make a practice of selling f. o. b. gin houses, this represented an actual range in prices. The range in mill prices decreased to 20 cents the following week, although this condition did not long exist. The average range the week following was $6.00. It is significant that the largest range in mill prices occurred during the week of the largest range in gin prices in the southern counties. The range in mill prices at that time was $9.75 while the range in gin prices was $13.00. At this particular time the highs for mill prices and gin prices were identical. It is quite evident that a gin or a few gins were retaining no margin in the seed. This was soon changed and

markets were reduced to approximately the average range for the season.

As compared to the northern counties, the range in mill prices to gins was wider in the southern counties. Although in no instances in the northern counties was the range for any week quite as narrow as that for the southern counties, at no time would it begin to equal that range of $9.75. One thing is noticed from an examination of Charts I and II ; the range in prices to gins in the northern group tend to be more irregular than in the southern counties. This also caused an irregular fluctuation in the average prices paid to producers each week. The mill prices in the southern counties were consistently higher than prices in the northern group.

Gin Margins in Cottonseed

As a whole throughout the season 1937-38 the gins in the southern group had smaller margins than the gins in the northern group. A wide or narrow margin in seed is synonymous to large or small profits. Their margins were reduced by paying a higher price for seed than did the northern gins. In an analysis of seed margins retained by ginners, it was found that margins were correlated with volume ginned. The gins in the southern group ginned an average of 1,084 bales, while the gins in the northern group ginned 819 bales. (Table 7). It may be that gins in the northern group, with less revenue from gin operations, were forced to retain more margin in the seed to supplement operating revenue. The competitive buying of seed to increase the volume ginned may have reduced seed margins in the southern counties.

Table 7. The Gins Active and Idle, Total Number of 500 Pound Gross Weight Bales Ginned by Counties and the Average Number of Bales of Cotton Ginned Per Active Gin by Counties in Southwest Oklahoma, Years 1937 and 1938

Counties	1938				1937			
	Number of Gins		Bales Ginned Per County (500 Pounds)	Average Bales Ginned Per Active Gin	Number of Gins		Bales Ginned Per County (500 Pounds)	Average Bales Ginned Per Active Gin
	Active	Idle			Active	Idle		
Northern								
Beckham	26	2	26,793	1,030	30	-	28,638	788
Blaine	8	5	4,566	571	11	2	5,756	523
Caddo	40	5	32,329	808	42	4	33,982	809
Canadian	7	1	2,806	401	7	1	3,643	520
Custer	12	2	3,074	256	13	1	5,164	397
Dewey	9	2	2,859	318	9	3	3,679	409
Garvin	23	2	15,796	686	24	1	26,803	1,117
Grady	25	4	17,055	682	27	4	20,187	747
McClain	17	1	14,960	880	17	1	18,080	1,064
Murray	5	-	2,933	586	5	1	4,634	927
Washita	26	2	19,939	767	29	3	26,373	909
Roger Mills	10	1	5,834	583	11	-	7,365	670
Total	208	27	148,944		225	21	184,304	
Average Bales Ginned				524				819
Southern								
Comanche	14	2	8,150	582	18	-	11,044	614
Cotton	9	1	7,602	845	9	2	6,839	760
Greer	16	4	14,405	900	20	2	22,637	1,029
Jackson	33	3	23,540	713	35	1	43,297	1,237
Jefferson	14	3	13,809	986	17	-	15,378	905
Kiowa	29	3	15,174	523	29	3	22,141	763
Stephens	13	2	11,113	854	13	2	16,394	1,261
Tillman	29	1	29,549	1,019	31	2	39,286	1,267
Harmon	12	0	10,681	890	12	1	22,421	1,868
Total	169		134,021		184		199,437	
Average Bales Ginned				793				1,084
State	685	156	545,196		754	133	756,419	
Average Bales Ginned				798				1,003

SOURCE: United States Department of Commerce, Bureau of Census, Cotton Production, Seasons 1937 and 1938.

An examination of Tables 5, 6, 8, and 9 reveals that the same general price relationships occurred in both seasons with a few exceptions. The average price paid by gins in the southern counties exceeded that of the price paid by the northern counties and the range in prices paid by gins was considerably wider than in the northern counties. But there were differences in the general pattern of price movements as compared to the previous season. In the season of 1938 the wide range in gin prices occurred from the middle of September to the middle of October. It may be of significance to note that during this period in 1938 61 percent of the cotton was ginned.[2/] When compared to the previous season the four weeks in which the greatest amount of range occurred, only 10 percent of the cotton was ginned. It may be that during this exceedingly active period in the season of 1938-39, gin operators felt they could increase farm prices of seed as operating costs were reduced when the volume was increased. But this would not hold true if the same hypothesis was assumed relatively to the season 1937.

In the 1938 season the southern gins retained smaller margins in the seed than the northern gins and received on the average a higher mill price for their seed. The range in mill prices throughout the season was greater than the preceding year, although it was never as high. It was found to be about the same in the southern and northern counties, but fluctuated rather irregularly.

2/ Cotton Production and Distribution, United States Department of Agriculture Bulletin No. 177, Bureau of Census for 1939-40. p. 12.

It is noticeable from an examination of Charts III and IV that gin margins increased gradually from the first of November until the end of the season in both groups in 1938-39. This did not take effect in the southern counties in the season 1937-38 until the middle of December, while gin margins in the northern counties decreased slightly throughout the season 1937-38. It seems that gins retained a relatively stable average price in the northern counties after the end of October in the two seasons studied. The average price never exceeded $21.00 and never fell below $19.70 until the end of January in 1937-38. During this period in 1938-39 the average price was about equal to the low of that year. This same relationship existed in the southern counties for this period but as a whole the prices averaged approximately $2.00 higher.

The average volume ginned per gin in operation decreased in 1938-39 in both southern and northern counties as compared to 1937-38. The respective ginnings in 1938-39 were 793 and 524 bales per gin, a decrease of about 300 bales from that of the preceding season. Gins in both groups increased the margin retained in the seed over that of the previous season. The gins in the southern counties increased the margin in 1938-39 slightly above that retained by northern gins in 1937-38 when the volume ginned was comparable. The gins in the northern group did not increase the margin in proportion to the increase by the southern gins, but there was a decided increase. (Tables 5, 6, 8, and 9). This indicates the contention that the margin in seed can be expected to increase in years of small crops and decrease in years of large crops.

Table 8 . The High, Low, Spread, and Weekly Average Farm and Oil Prices for Cottonseed; Also Gin Margins in the Southern Counties, Southwest Oklahoma, 1938-39

Week of	Farm Price Per Ton (Dollars)				Mill Price Per Ton (Dollars)				Gin Margin
	High	Low	Spread	Weighted Average	High	Low	Spread	Weighted Average	
Aug. 1-7	25.00	20.00	5.00	20.31	-	-	-	-	-
Aug. 8-14	22.00	20.00	2.00	20.05	-	-	-	-	-
Aug. 15-21	23.50	20.00	3.50	19.94	-	-	-	-	-
Aug. 22-28	25.50	18.00	7.50	19.74	22.00	22.00	-	22.00	2.26
Aug. 29-Sept. 4	25.00	18.00	7.00	18.98	24.00	21.00	3.00	22.19	3.21
Sept. 5-11	25.00	18.00	7.00	19.20	27.30	21.00	6.30	22.70	3.50
Sept. 12-18	30.00	17.00	13.00	19.65	27.30	21.00	6.30	22.50	2.85
Sept. 19-25	30.00	18.00	12.00	21.10	27.30	21.00	6.30	23.95	2.85
Sept. 26-Oct. 2	30.00	18.00	12.00	21.56	28.00	21.00	7.00	25.70	4.14
Oct. 3-9	30.00	18.00	12.00	23.33	28.50	23.00	5.50	25.98	2.65
Oct. 10-16	25.00	20.00	5.00	22.75	29.20	23.00	6.20	27.08	4.33
Oct. 17-23	25.00	19.00	6.00	21.75	29.00	25.00	4.00	27.04	5.29
Oct. 24-30	25.00	19.00	6.00	21.89	30.00	24.50	5.50	25.80	3.91
Oct. 31-Nov. 6	27.50	20.00	7.50	22.10	28.00	24.50	3.50	26.30	4.20
Nov. 7-13	27.50	20.00	7.50	21.97	30.00	25.10	4.90	26.75	4.78
Nov. 14-20	32.00	20.00	12.00	22.16	30.00	25.00	5.00	27.83	5.67
Nov. 21-27	27.50	20.00	7.50	22.19	29.00	26.00	3.00	26.83	4.64
Nov. 28-Dec. 4	27.50	20.00	7.50	22.05	29.00	25.00	4.00	27.49	5.44
Dec. 5-11	27.50	20.00	7.50	22.19	29.50	25.00	4.50	27.37	5.18
Dec. 12-18	27.50	20.00	7.50	22.10	29.50	26.00	3.50	28.22	6.12
Dec. 19-25	22.00	29.00	-	22.00	28.50	27.30	1.20	28.07	6.07
Dec. 26-Jan. 2	22.00	22.00	-	22.00	28.10	27.30	0.80	27.78	5.78
Jan. 3-9	22.00	22.00	-	22.00	29.50	24.00	5.50	27.57	5.57
Jan. 10-16	22.00	22.00	-	22.00	28.10	27.00	1.10	27.78	5.78
Jan. 17-23	22.00	22.00	-	22.00	28.00	24.00	4.00	27.18	5.18
Jan. 24-30	22.00	22.00	-	22.00	28.10	28.10	-	28.10	6.10

Southern Counties: Comanche, Cotton, Greer, Jackson, Jefferson, Kiowa, Stephens, Tillman, and Harmon.

Table 9 . The High, Low, Spread, and Weekly Average Farm and Oil Prices for Cottonseed; Also Gin Margins in the Northern Counties, Southwest Oklahoma, 1938-39

Week of	Farm Price Per Ton (Dollars)				Mill Price Per Ton (Dollars)				Gin Margin
	High	Low	Spread	Weighted Average	High	Low	Spread	Weighted Average	
Aug. 1-7	20.00	20.00	-	20.00	23.00	22.00	1.00	22.57	2.57
Aug. 8-14	20.00	18.00	2.00	18.47	24.00	24.00	-	24.00	5.53
Aug. 15-21	20.00	18.00	2.00	18.44	23.00	23.00	-	23.00	4.56
Aug. 22-28	20.00	18.00	2.00	18.35	-	-	-	-	-
Aug. 29-Sept. 4	20.00	18.00	2.00	18.24	23.00	22.00	1.00	22.34	4.10
Sept. 5-11	20.00	18.00	2.00	18.26	26.00	21.00	5.21	22.31	4.05
Sept. 12-18	20.00	17.00	3.00	18.38	25.00	22.00	3.00	24.00	5.62
Sept. 19-25	25.00	17.00	8.00	19.56	27.00	21.00	6.00	23.44	3.88
Sept. 26-Oct. 2	25.00	18.00	7.00	20.47	27.10	21.00	6.10	25.32	4.85
Oct. 3-9	25.00	20.00	5.00	22.27	29.50	23.00	6.50	26.58	4.31
Oct. 10-16	25.00	20.00	5.00	21.86	28.00	23.00	5.00	26.32	4.46
Oct. 17-23	25.00	19.00	6.00	20.38	28.00	23.00	5.00	24.92	4.54
Oct. 24-30	24.00	18.00	6.00	19.84	27.50	22.00	5.50	24.12	4.28
Oct. 31-Nov. 6	24.00	18.00	6.00	19.99	27.10	22.00	5.10	24.94	4.95
Nov. 7-13	24.00	18.00	6.00	20.01	27.00	23.00	4.00	25.16	5.15
Nov. 14-20	24.00	19.00	5.00	19.92	29.50	25.00	4.50	26.55	6.63
Nov. 21-27	23.00	19.00	4.00	19.75	28.10	25.00	3.10	26.90	7.15
Nov. 28-Dec. 4	23.00	19.00	4.00	19.77	30.00	25.00	5.00	27.82	8.05
Dec. 5-11	23.00	19.00	4.00	19.78	29.50	25.00	4.50	27.28	7.50
Dec. 12-18	23.00	19.00	4.00	19.71	30.50	25.00	5.50	27.75	8.04
Dec. 19-25	23.00	19.00	4.00	19.80	30.00	25.00	5.00	27.43	7.63
Dec. 26-Jan. 2	23.00	19.00	4.00	19.98	29.50	29.50	-	29.50	9.52
Jan. 3-9	23.00	19.00	4.00	20.16	-	-	-	-	-
Jan. 10-16	23.00	19.00	4.00	20.63	-	-	-	-	-
Jan. 17-23	23.00	19.00	4.00	22.01	28.00	28.00	-	28.00	5.99
Jan. 24-30	23.00	20.00	3.00	22.40	-	-	-	-	-

Northern Counties: Beckham, Blaine, Canadian, Custer, Dewey, Garvin, Grady, McClain, Murray, Washita, and Roger Mills.

It is apparent that the price differs between the southern and northern counties. Whether or not this can be attributed to the nearness of the Fort Worth and Dallas market for seed cannot be definitely stated. But an analysis of location of sales by gins would rather indicate that this is true. In 1937-38 only five gins from the northern group made sales in Fort Worth and only two in 1938-39 as compared to eight gins in 1937-38 and seven gins in 1938-39 in the southern group. The number of gins selling in the Fort Worth market is not indicative of actual conditions. A comparison of volume for the two seasons combined showed that the northern group made 12 sales totaling 105 tons to Fort Worth. The southern group in the same period made a total of 73 individual sales comprising a volume of 2,396 tons compared with the total volume marketed neither quantity is significant, but they do indicate some influence of the Fort Worth Market.

Method of Sale by Gin

An analysis of the method of sales was made primarily to discover if gins speculated in seed prices and whether or not they were inclined to bargain with mills relative to the volume sold at any particular time. Only 73 gins out of a total of 137 cooperating in both years in this price study gave any indication as to the method of sale used. From an examination of the schedules it was revealed that 44 gins for the two years studied sold for cash upon delivery; 10 gins sold strictly on contract or sold short during the entire season, and 19 gins made a practice of selling for cash and selling short during the two seasons studied. One gin contracted its entire purchases of seed to one mill at the beginning of the season. In most instances where short selling

CHART III

RANGE IN PRICE PAID FARMERS AND GINNERS IN SOUTHERN COUNTIES FOR COTTONSEED, BY WEEK, (SEASON 1938-9)

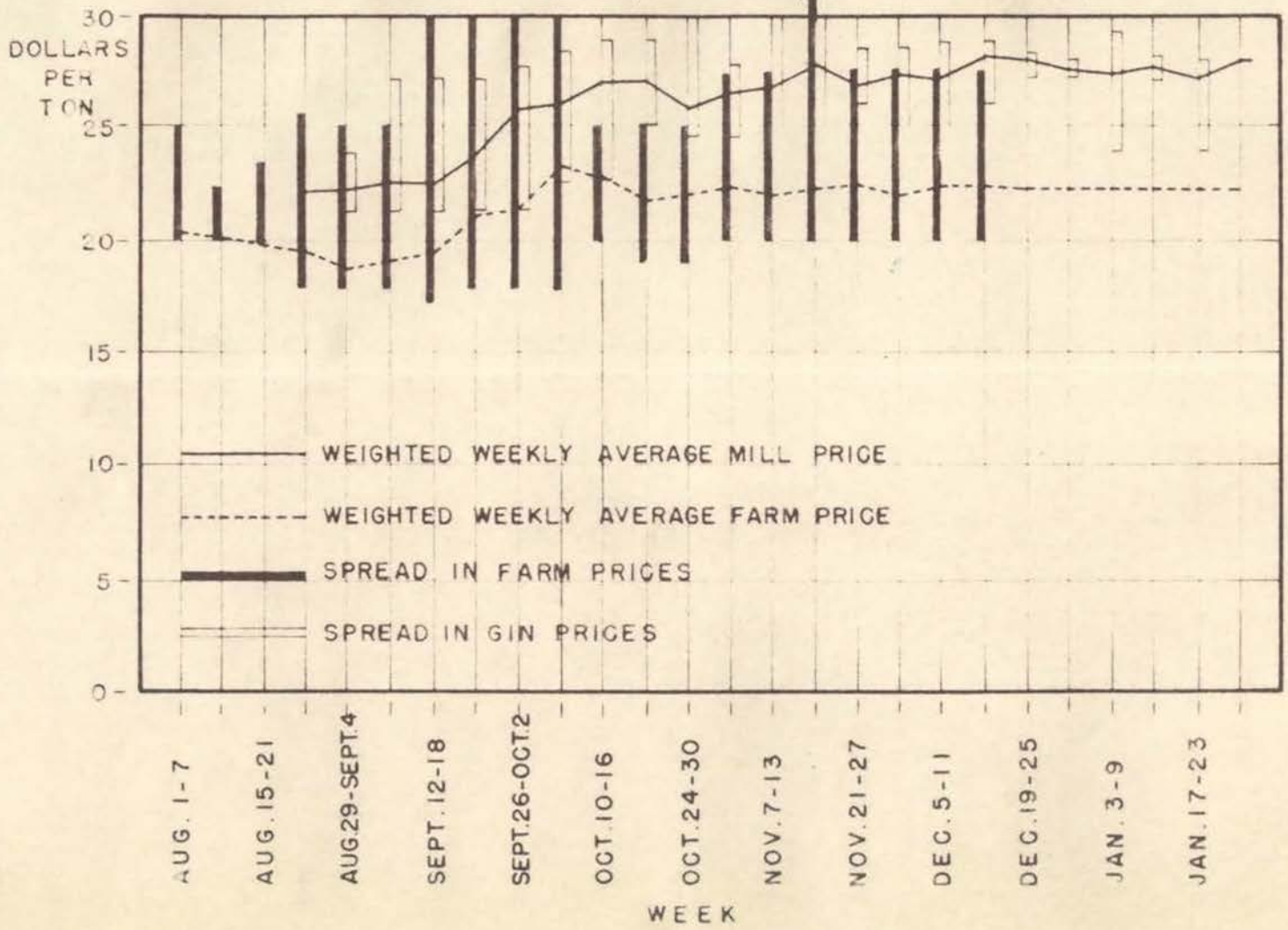
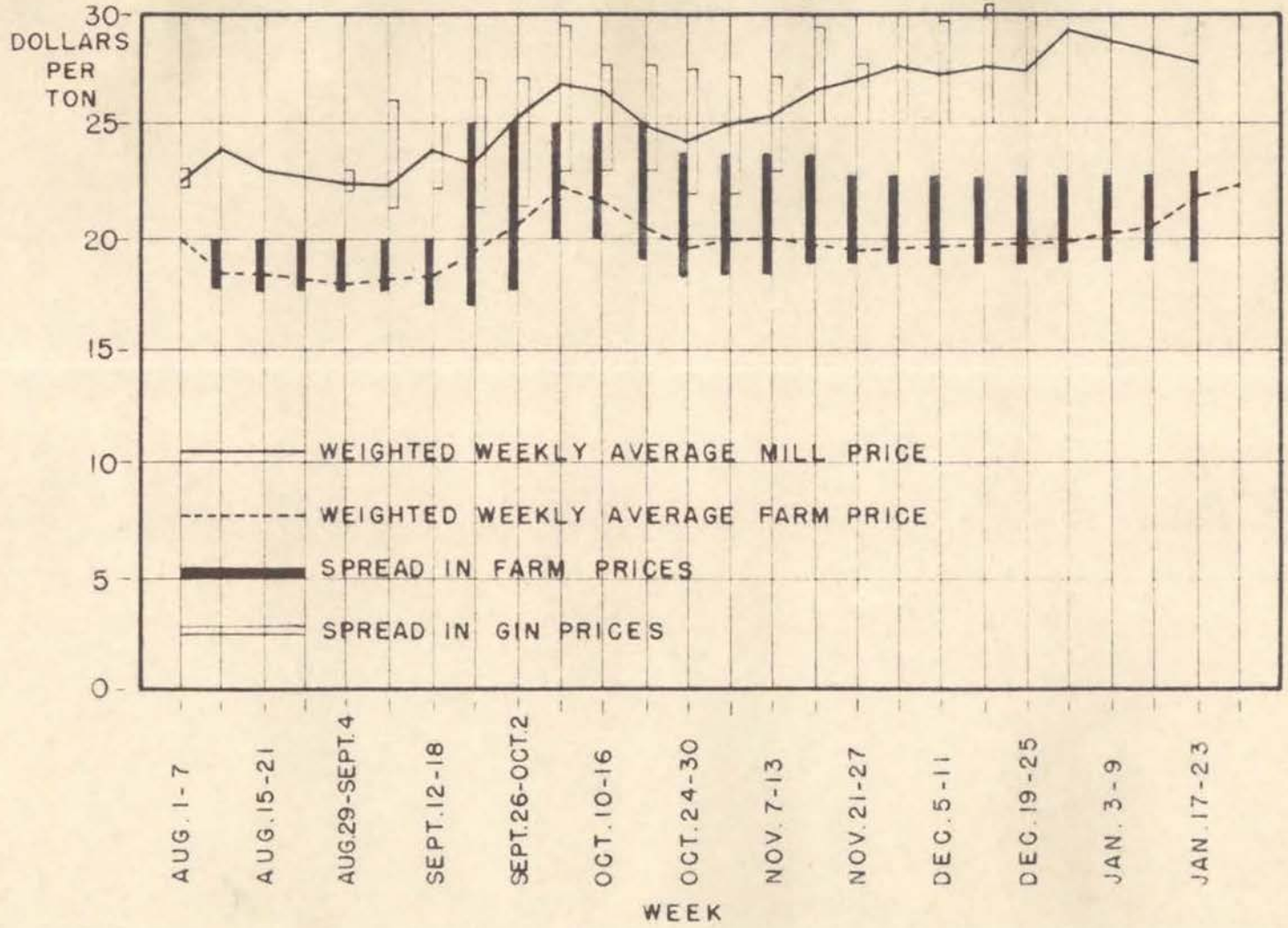


CHART IV

RANGE IN PRICE PAID FARMERS AND GINNERS IN NORTHERN COUNTIES FOR COTTONSEED, BY WEEK, (SEASON 1938-9)



was practiced, a comparatively small volume was sold short, a car load or a week's ginning. In only a few cases was it noted that gins selling short or selling on contract received more for their seed than gins selling strictly for cash and making delivery at the time of sale. In fact several gins contracted seed below what other gins sold for cash that particular week. It is not known to what extent the gins were hedging operations when they sold short nor to what extent they were speculating when they accumulated seed. Gins in response to questionnaires stated that prices to customers would be raised or lowered according to the amount bid them on seed by the mills. However, this was not substantiated by Charts I and II. It was the common practice, except in a very few instances, after the average mill price was increased to gins to increase the average gin price. However, in a few instances it is noted that a small decrease in mill prices was not reflected back to farmers in a lower gin price. Gins decreased margins and retained the original price. In some cases the gin price was increased although the mill price had been previously decreased.

Volume Marketed by Gins

The gins bargaining position did not seem to be improved when the volume marketed was increased. It did not appear to have been impaired although a number of gins maintained that a large volume was a liability rather than an asset, in that a large volume of unsold seed on hand depressed prices. Gins were of the opinion that this was caused by monopolistic conditions in the market. This concept of the marketing organization may or may not have influenced practices followed by gins.

But a hypothesis of this nature should not be ignored for a lack of quantitative measurement.

In an analysis of individual schedules of sales by gins, many variations were found. Gins located at a greater distance from oil mills tended to sell less frequently and in irregular lots, while gins close to oil mills sold regularly. Volume marketed corresponded to volume ginned. Other gins were found that practiced selling in even lots of 10 to 200 tons at a time. It is probable this was controlled to a great extent by the system of transportation. Gins that shipped by rail to distant mills generally made sales on the basis of car lots. This made for uniformity in volume marketed.

To a certain extent the volume marketed at any particular time was influenced by the method of sale. As was previously pointed out, short or contract sales were for definite amounts, such as a car lot or a truck load and in many cases a week's ginning. The latter was beyond the control of the ginner, because of delays in harvesting and varied for different periods of the ginning season.

In regard to the contention that large volumes depressed prices, this was not found to be the case. Prices increased as frequently as they decreased after sales of large volumes. Although there was no relationship between volume and price, several tendencies were apparent. When the mill price increased after a decline, gins contracted larger amounts for sale for immediate delivery. In many cases gins sold very small amounts preceding a decline in price. This is likely a result of the mills policy of notifying gins in advance of a decrease in prices. In no case were these sales contract or short sales but they were spot sales for immediate delivery.

A number of mill buyers, in personal interviews, regarding the mill's buying policy, stated that the mill did not encourage contracting of large volumes by the gins. First, there are no exchanges to govern the rules of the contract whereby the contract can be enforced Secondly, sales on contracts disrupted the local market especially when prices were continually changing. Gins that made a short sale prior to a decline retained the old gin price in order to increase ginning volume. Other gins blamed the mills for this disruption of the local market. Consequently mills encouraged gins to make either spot or cash sales for immediately delivery.

Summary

The farm prices for cottonseed in the southern counties for the two seasons are closely related, however, cottonseed prices averaged approximately two dollars higher in the southern counties as compared to farm prices in the northern counties. There was consistently more range in cottonseed prices in the southern counties and this was a factor in establishing a higher price in the southern counties.

Although mill prices to gins in the southern counties were slightly higher than mill prices to northern gins, this fact alone did not make the entire spread between the two groups. The amount of margin retained in the cottonseed by the gins in the northern counties was of equal importance in the price differential between the two groups. As volume ginned in the northern counties was consistently lower than in the southern counties it is probable gins resorted to higher margins in cottonseed purchased to supplement ginning revenue.

CHAPTER V. QUALITATIVE ANALYSIS RELATIVE TO PRICE FLUCTUATIONS OF COTTONSEED AND COTTONSEED BY-PRODUCTS

It is only recently, measured by the time the cottonseed industry has been established, that any attention has been given to a consideration of quality of cottonseed in the market. It was commonly thought that cottonseed would out-turn the same quantity and quality of by-products regardless of conditions that could have affected its growth. This is the attitude of a majority of producers today. Research by chemists soon established the fallacy of what was assumed as a fact. Despite the advancement in this field of analysis, G. S. Moley says "this still exists in the minds of some of those engaged in the crushing of seed."[1/]

Development of Standards

Early in the development of standards for cottonseed it was apparent that a grade index would need to be a derivative of a quality and quantity index. The quantitative index, therefore, is based upon the combined value of the oil and ammonia in the seed, and the qualitative index is a measure in terms of percentage of purity and soundness of the cottonseed. It also reflects the relative decomposition of the seed, the presence of foreign matter, and the moisture content.[2/]

1/ G. S. Moley, A Study of the Variable Composition of Cottonseed, 1931, Division of Cotton Marketing, Agricultural Marketing Service, United States Department of Agriculture.

2/ The Official Standards for the United States for the Grading, Sampling, and Analyzing of Cottonseed Sold or Offered for Sale for Crushing Purposes, Service and Regulatory Announcement, No. 133, Bureau of Agricultural Economics, United States Department of Agriculture.

For the purpose of quantitative determination, cottonseed is "basis grade" or prime, provided it contains 18.5 percent oil and 3.5 percent ammonia; and a qualitative determination of not more than 1.8 percent free fatty acids in the oil in the seed; 3.0 percent foreign matter; and 12.0 percent moisture. Today the accepted standard yields per ton of cottonseed of the "basis grade" are: 313 pounds of oil; 822 pounds of 41 percent protein meal or cake; 125 pounds of grade four linters; and approximately 640 pounds of hulls.[3/]

To arrive at a basis grade the quality index is multiplied by the quantity index. To establish the premium or discounts on seed it is then necessary to apply the grade index to the basis grade price.

One of the major objectives of this study was to isolate, if possible, the effect of quality on price fluctuation during the season and try to determine if quality were a factor in the price variation from one season to another. It was necessary to secure the cooperation of mills purchasing seed in southwestern Oklahoma to obtain the information relative to the composition of the seed. Neither Oklahoma nor Texas Mills cooperate with the Agricultural Marketing Service as yet in furnishing this type of information. This information was secured only for the season 1937-38.

This particular analysis of the price study was discontinued in 1938-39 for several reasons. Mills did not make a practice of systematically sampling and analyzing seed regularly. Seed was generally analyzed when mills anticipated some change in quality from that of

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3/ The Official Standards for the United States for the Grading, Sampling, and Analyzing of Cottonseed Sold or Offered for Sale for Crushing Purposes. Op. cit. p. 1.

previous purchases. It was impossible to supervise sampling for analysis. Discussions relative to sampling left the impression that samples were carelessly drawn in many instances.

In the study of quality of cottonseed for the season of 1937-38, it was found that there was no immediate effect on price when there was a change in the grade.[4/] It is quite apparent that for the early part of the season price and grade moved inversely. After the week ending September 25 there was a tendency for grade and price to have the same general movement. This was especially true during the most active ginning season. In no instance were quotations made to gins on the basis of grades. One price only was quoted. Only two gins reported selling seed on any semblance of grades. Their schedules carried notations that the early ginnings were sold as Number 1's and that of the period immediately following as Number 2's, and the remainder as Number 3's. In both examples the gins were paid more for Number 2 seed than Number 1. This does not necessarily mean that no attempt was made to purchase seed by mills on quality basis. The base price could have risen during the second period.

Mills defended their system of buying on the premise that the additional cost involved to analyze each lot purchased from the different ginners would make the service prohibitive; also, that a discrimination among gins would cause more dissatisfaction than the benefit received. Then again the mills claim that because of the composition of Oklahoma

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4/ Chart V was constructed by expressing the price or grade as a percent of the average price or grade for the season, and laying the average index on the horizontal line as 100. Variations throughout the week were plotted as deviations from this base line.

seed the one standard formula used by the United States Department of Agriculture would not be suited to seed grown under Oklahoma conditions.

An analysis of the material presented in Chart V would indicate that producers are not receiving a price based upon the quality of their product.[5/] The local price was above the basis grade index price during the first two weeks of the season and the week ending December 4 and was equal to the basis grade price one week. The greatest amount of variation was in the period September 18 to October 16. If the local price had been a result of the basis grade price the two lines on Chart V). would have been on the same plane. That is, the two lines would have been the same. In this case, because of the method used in construction of Chart V ; it is also possible that a perfect correlation could exist between local price and the basis grade index; and at the same time local prices could have been out of line with the basis grade price.

The present grading system was predicated on the hypothesis that seed would average 313 pounds of oil and 822 pounds of cake, therefore, it would seem logical to assume that decreases in oil content of seed would invalidate the contention that the basis grade index should be applicable in all instances. Provided, this quantitative differential of the principle components should result in the establishment of a new ratio for the value of the by-products. At the least it would seem that a disruption of the quantitative ratio would cause seed prices based on past analysis to get out of line with the grade index. In all probability the disparity in the beginning of the season 1937-38 between farm price and the grade index price can be partially attributed to this

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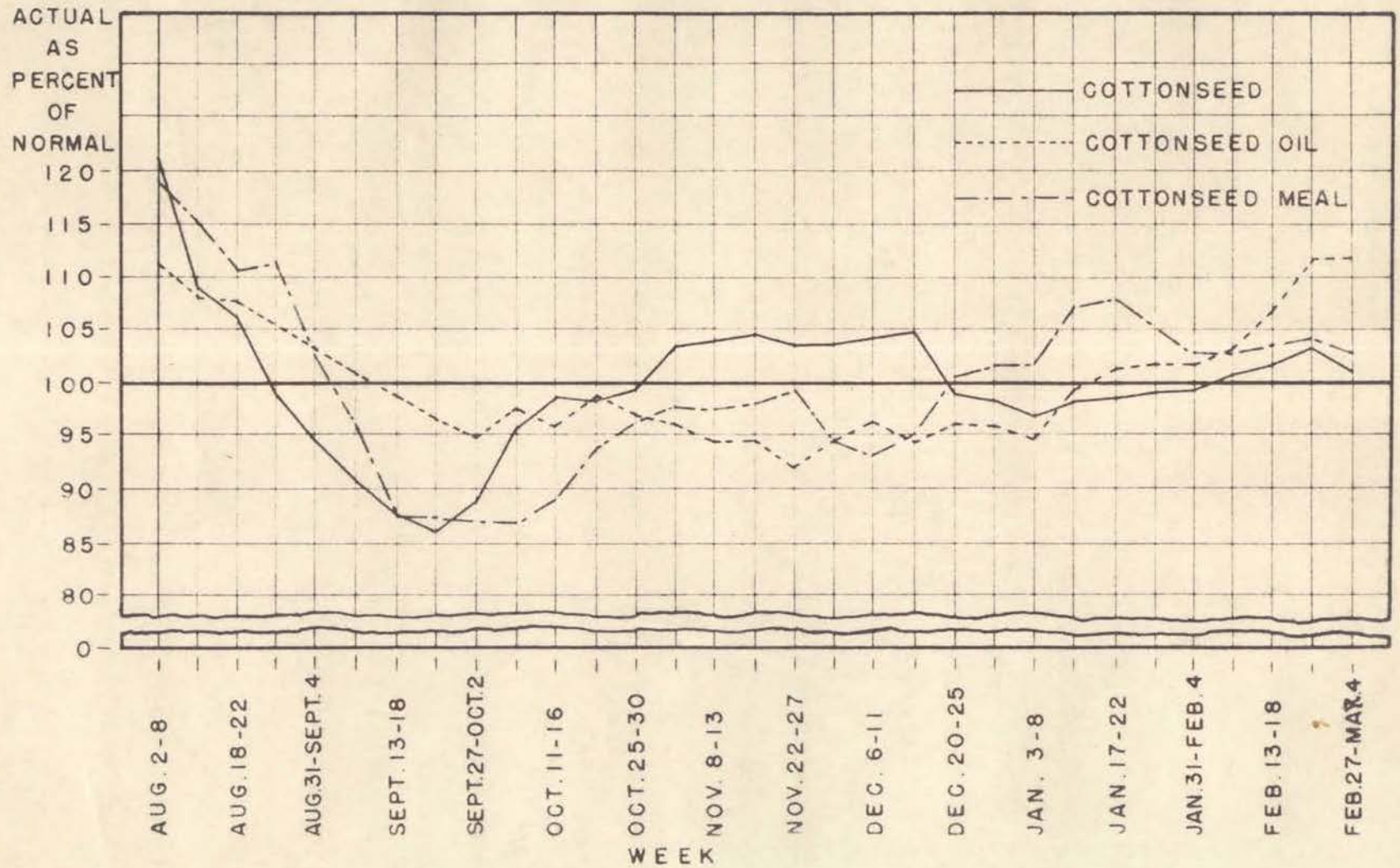
5/ See Appendix.

CHART V

A COMPARATIVE ANALYSIS OF PRICE TRENDS FOR COTTONSEED, COTTONSEED OIL, AND COTTONSEED MEAL (AUGUST 2, 1937 TO MARCH 4, 1938)



factor. The monthly spot price for cottonseed oil, Prime Summer Yellow, at New York[6] decreased from 8.60 cents per pound in July to 8.10 in August, 7.80 in September and fell to 7.40 by November in 1937. This was a decrease of 14 percent. The average monthly price per ton of 41 percent protein cottonseed meal at Memphis[7] decreased from $23.25 in July to $20.90 in October, then increased to $21.75 by November. This was only a 6 percent decrease. If the above assumption of differing ratios is valid the two factors acting in conjunction probably resulted in the two trends not equating.

The Influence of the Supply and Demand Situation on Prices

The supply of cottonseed meal in Oklahoma can be considered as the amount produced by state mills supplemented by the sales of meal by out-of-state mills in Oklahoma. From Table 10 it is evident that Oklahoma was a surplus producing area of meal or cake until the season of 1934-35 after which Oklahoma produced less than was consumed. However, in 1937-38 production exceeded amount used but this was not the case in the season 1937-38. Consequently, the price relationships formerly existing are no longer effective.

While there are no data available for wholesale or retail prices for meal in Oklahoma, farm prices for cottonseed are available and are used for comparison. Four selected years were used. In 1932 and 1933 Oklahoma mills produced 176 and 187 thousand tons, respectively. (Table 11). Consumption was 99 thousand tons in 1932 and 51 thousand tons

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6/ Agricultural Statistics, 1940. p. 137.

7/ Ibid. p. 138.

Table 10. The Amount of Cottonseed Produced, Cake or Meal Produced and Consumed; the Amount Supplied by State Mills and the Amount Shipped into Oklahoma, 1929-1938

Year	Cottonseed Produced Tons 1/	Cake and Meal Produced Tons 2/	Cake and Meal Consumed Tons 3/	Supplied by State Mills: Tons 3/	Supplied by State Mills: Per-cent	Supplied by Out of State Mills: Tons 3/	Supplied by Out of State Mills: Percent
	(000)	(000)	(000)	(000)		(000)	
1929	508	170	82	76	92.5	6	7.5
1930	379	123	73	65	89.3	8	10.7
1931	561	164	72	65	90.5	7	9.5
1932	482	176	99	93	94.4	6	5.6
1933	563	187	52	44	85.8	7	14.2
1934	143	55	73	62	85.5	11	14.5
1935	252	89	96	71	73.5	25	26.5
1936	129	40	77	69	89.9	8	10.1
1937	357	129	75	59	78.6	16	21.4
1938	247	87	46 4/	39 4/	85.2 4/	7 4/	14.8

1/ Yearbook of Agriculture, 1933, 1934, 1935, 1937, and 1938, United States Department of Agriculture

2/ Cotton Production and Distribution, Bulletins Nos. 166 and 175, Bureau of Census.

3/ From sales of tags by the State Department of Agriculture, Oklahoma City, Oklahoma.

4/ Through April 15, 1939.

in 1933. This left a net surplus for the two years of 211 thousand tons of cottonseed meal. The ratio of exchange, that is seed for meal, stood at 1.9 tons of seed for one ton of meal in August 1932. This ratio of exchange gradually decreased until January 1933 it was 1.6 tons of seed for one ton of meal. In case producers are directly affected by this ratio, that is they make a practice of exchanging seed for meal, the immediate effects are more readily noticeable. 8/ After January of

8/ It is common practice in Western Oklahoma for producers to exchange seed for meal. In a few instances it was noted that a higher price was paid for seed when they were trade.

Table 11. Cottonseed Meal, 41 Percent Protein, Average Price Per Ton, Bagged, Carlots, Memphis and Oklahoma, Farm Prices for Cottonseed, by Months 1932, 1933, 1934, and 1936

	January	February	March	April	May	June	July	August	September	October	November	December
	(Dollars Per Ton)											
1932												
Meal	13.80	12.80	12.45	12.85	12.65	11.50	13.15	17.35	16.75	14.40	13.35	11.80
Seed	9.60	9.10	8.80	8.70	8.50	8.10	8.10	9.10	9.10	8.80	7.80	7.60
1933												
Meal	11.85	12.00	13.10	15.20	17.50	18.60	27.65	22.90	18.40	16.70	19.25	19.25
Seed	7.50	7.60	8.00	9.00	11.00	11.00	16.00	16.00	10.00	10.10	11.50	12.90
1934												
Meal	22.50	24.00	24.00	22.00	21.25	23.25	27.05	34.80	33.90	33.90	37.00	37.35
Seed	13.00	16.00	17.75	18.25	20.00	19.50	20.00	24.00	36.00	35.00	38.00	38.00
1936												
Meal	21.20	20.65	20.10	21.40	21.55	22.50	32.10	33.95	30.95	29.90	32.25	34.20
Seed	28.00	27.00	28.00	28.00	27.00	25.00	28.00	30.00	30.00	30.00	29.00	30.00

SOURCES: (1) "Cottonseed Meal, 41 Percent Protein Average Price Per Ton, Bagged, Carlots, Memphis," Agricultural Statistics, 1940, United States Department of Agriculture, p.138.

(2) "Oklahoma Farm Prices for Cottonseed," Supplement to Current Farm Economics, Oklahoma Agricultural Experiment Station Bulletin No. 238, Stillwater, Oklahoma, p. 25.

1939 this ratio began to increase, that is, it took more seed to purchase a ton of meal and by July 1933 the ratio was 1.7 tons of seed to one ton of meal.

If the above years are compared to 1934 and 1936 when Oklahoma produced 55 thousand and 40 thousand tons of cottonseed meal, the price relationships are almost reversed. During these two years Oklahoma consumed 150 thousand tons of meal. This was 55 thousand tons more than Oklahoma produced.[9/] This relationship between supply and demand quickly resulted in a decreasing ratio as the season progressed when it became apparent that the supply was not going to be sufficient to meet demands. Before the ginning season was far advanced in (August) 1934 the ratio was 1.4 tons of seed for one ton of meal but by October a producer could exchange a ton of seed for a ton of meal. The exchange ratio was even more favorable in 1936 than 1934. In March 1936 a ton of seed would exchange for a ton of meal and leave the producer $9.90. This was to be expected as total meal production for this season met only 50 percent of domestic needs while it accounted for 75 percent of domestic needs in 1934.

The cottonseed oil price is today the dominant factor directly affecting seed prices for the industry in general. But because of the scarcity or deficit position of Oklahoma this no longer holds true in years of small production. (Chart V). From the week of August 2 to 8 seed and meal prices have a high positive correlation until the week

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9/ Oklahoma mills supplied more than the above. This was due to the fact that Oklahoma mills bought the meal from outside of the State and purchased tags from the State Department of Agriculture, which made it appear in the table as if they were milled in the State.

ending November 27 after which the oil price began to be more effective as a determinant of cottonseed prices. In 1937 Oklahoma mills produced 54 thousand tons more than were consumed in the State. This brought about the reestablishment of former price relationships of the raw product and its principal components.

Summary

The value of cottonseed varies as the quantity of its principal components varies. Formulas have been established by which a grade is evolved after chemical analysis has been made of the seed. Where grading is systematically followed mills quote prices on "basis grade" seed and pay premiums for seed above "basis grade," and discount seed below "basis grade."

Oklahoma mills do not practice buying from gins on a grade index, but mills analyze seed for their own information and adjust the "overall" price accordingly. This seems to be substantiated from a comparison of an index constructed from the mills's analysis. It was found that the grade index and the average price trend had the same general movement after the first of the season.

The primary factor affecting price is the constantly fluctuating supply and demand situation. In years when the production of seed was smaller than the consumption the seed-meal ratio was very narrow. One ton of seed would exchange for more than a ton of meal. In years when production exceeded the amount consumed larger quantities of seed were required in the exchange; in a few cases two tons of seed were equable to one ton of meal.

When Oklahoma is a surplus producing State, cottonseed prices tend to be influenced more by changes in oil prices, but in years when Oklahoma becomes a deficit area seed prices follow more closely cottonseed meal prices.

CHAPTER VI. THE MARKET FOR COTTONSEED PRODUCTS

Development of the Market for Cottonseed Oil

The period immediately following the Civil War was one of declining prices for farm products.[1/] This decline can be attributed to various factors: the unstable monetary system, the rapid expansion of agricultural production into the new lands of the Mississippi Valley, the extension and development of domestic commerce, and the improvement of internal communication and transportation facilities. The development of railroad transportation shifted the center of production of all the small grain crops on which the dairy and livestock industry in the eastern seaboard states were established.[2/]

The center of livestock production naturally followed the small grains which caused a relocation of the packing industry in the north central states.[3/] Lard, one of the chief products of the packing industry, had to be transported many miles to the eastern industrial center located on the Atlantic seaboard. To meet this increasing cost and at the same time to present the public with a cheap, wholesome product, packers resorted to adulteration of pure lard with vegetable oils. Because of the enormous supply and relative cheapness as compared with other oils, cottonseed oil was the substitute generally used.[4/] For many years manufacturers made no attempts to conceal the fact; it became more or less a universal practice.

1/ George F. Warren and Frank A. Pearson, Prices, 1933, pp. 24-38.

2/ Edward C. Kirkland, History of American Economic Life, 1936, pp. 130-176.

3/ Ibid. pp. 165-169.

4/ Weber and Alsberg. Op. cit. pp. 8-19.

The incident referred to by Mr. Parrish in his letter to the editor of the Cotton Oil Press concerning the shipping of cottonseed oil out of Memphis by the N. K. Fairbanks Company in tank cars branded "Garden City Dairy Company of Chicago," may have been the general practice when the packing industry first began the use of cottonseed oil in the adulteration of lard, but by 1890 little or no attempt was made to conceal the fact. In 1881 the practice was so well established that a committee which investigated a dispute that arose out of a refusal to accept a shipment of lard because of "alleged adulteration" decided that they could see no reason why the lard should not be received on contract.[5/]

The use of cottonseed oil as well as other oils as an adulterant or substitute for lard might have developed unhampered if it had not been for the McGeogh case and its aftermath.[6/] In 1883 McGeogh of Milwaukee attempted to corner the lard market, and when deliveries began to be presented he rejected 1,000 tierces on the ground that it was not prime steam lard. As the lard had already passed inspection and because of the connection with the corner in the lard market it brought the controversy before the public. The aftermath of the attempted corner by McGeogh was far reaching. It received national recognition as states immediately began to formulate legislation to restrict adulteration of lard.

It is worthwhile to note that the agitation for some measure of control of the packing industry was initiated by packers with interests

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5/ Weber and Alsberg. Op. cit. p. 37.

6/ Ibid. pp. 37-40.

in the eastern states who could not meet this type of competition.[7] Massachusetts was the first state to pass laws which required the manufacturers to label their products whereby the public would know that the products were not pure but a compound of vegetable oils. Other states located in the east and north soon followed Massachusetts by enacting similar legislation until 1888 a large number of states were trying to regulate the adulteration of a "wholesome product" by the use of vegetable oils, principally cottonseed oil. These laws were generally evaded as they were loosely drawn. Agitation soon found its way into the Federal halls of legislation and in December 1887, Senator Dawes of Massachusetts introduced into Congress a bill "to protect the manufacture and sale of pure lard,"[8] which was the result of a request by John P. Squire, a packer of Cambridge, Massachusetts. A similar bill was introduced a month later by Representative Butterworth of Cincinnati. The oil milling industry did not permit these bills to be presented without presenting their side of the controversy. The battle raged throughout the sessions of the 50th and 51st Congresses. Chemical analysis proved the claims of the oil industry that they were selling to the public a wholesome, palatable product which was more than the product of the lard refiners.[9]

7/ Weber and Alsberg. Op. cit. p. 40.

8/ Ibid. p. 41.

9/ It seems that a voluminous report was presented relative to the practice of lard packers including any kind of hog in the lard regardless of the disease it might have had when butchered. The oil industry contended it would be better for their product not to be connected with any industry that used piggy sows and decayed meat in the manufacture of lard.

Eventually these hearings by the Agricultural Committee approached some semblance of sanity. At least Representative McClammy of North Carolina wrote into the minority report against the Conger Bill, which was sponsored by the lard packing industry, the basis of all the dissention.[10/]

The Conger Bill was declared bad because:

1. It would increase the price to consumers of a wholesome and necessary food product.
2. It discriminates in favor of one manufacturer against another.
3. It would injuriously affect "the agricultural interest of cotton growing."
4. It prescribed unprecedentedly severe penalties for its infringment."
5. It seeks "to regulate the manufacturers of lard compound" at the solicitation of manufacturers who are themselves in greater need of regulation.

The report also met the claim of packers that the use of vegetable oils were depressing the corn and hog industry.

It was pointed out that low hog prices were due to a large supply of cheap corn and that a failure of the corn crop was responsible for the packers having to pay more for hogs. It seems that the lard packers were claiming to be representatives of the downtrodden farmers and the unsuspecting and uninformed public. But when the minority report included the reports of the New York and New Hampshire Boards of Health in which the compounds were found to be as wholesome as any of the so-called "pure lards," this angle of attack was quickly dropped.[11/] The discontinuation of the attack on the use by packers of cottonseed oil as an adulterant in lard manufacture was probably a result of integrating

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10/ Weber and Alsberg. Op. cit. p. 50.

11/ Ibid. p. 31.

packing, compound manufacturing, oil refining, and crushing by the large packers. (See Chapter II, page 16). The combinations formed were of advantage in that the packers could control the supply of oil needed in production of compound. It also gave the oil refining industry an outlet for oil. Independent compound manufacturers were dependent upon packers for animal fats to give body or hardness to the compound, consequently joint ownership was desirable. However, a few years prior to the World War the compound industry began to break away from the packing industry. This was caused by the development commercially of the present process used to harden oils, hydrogenation. The severance of the independent relationship of the compound industry with that of packers did not remove the independence of the prices of lard and compound, of which more is to be said later.

The Demand for Cottonseed Oil

The cheapness of cottonseed oil was one of the economic forces which caused it to be used as an adulterant in lard. However, compounds were not the only outlet for cottonseed oil. Aspegren's estimates of domestic uses of cottonseed oil, annually from 1874-75 to 1911-12[12/] does not give any data on cottonseed oil consumption for lard compound until 1880-81. In 1874-74 of the total domestic consumption of 154 million pounds, 10.4 million pounds were used in soap making and four million pounds in salad oils. In 1884-85 a total of 70.4 million pounds were domestically consumed. Soap making consumed 19.9 million pounds, salad oils 8.0, cooking and baking 2.0, lard and compound 29.8, oleomargarine

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12/ Weber and Alsberg. Op. cit. p. 317.

6.0, packing sardines 2.0, and 2.7 millions pounds were consumed in all other uses.

The same industries consume a large percentage of cottonseed oil today. (Table 12). In 1931, 71 percent of the total factory consumption of 1.1 million pounds was consumed by the compound industry, 1 percent or 16 million pounds by oleomargarine establishments, and 6 percent by other edible products. Eight percent was classified as foots and losses in manufacturing soap while 14 percent was unaccounted for. (Table 12). Since 1931 there has been an appreciable decrease in the percentage of cottonseed oil used in manufacture of compounds and vegetable cooking fats of 9 percent to 62 percent in 1938. However, there was an absolute increase in the amount used, for in 1931 there were 928 million pounds, or 71 percent, compared to 1,040 million pounds in 1938 which amount was 62 percent of total disappearance. The total consumption of fats and oils by these industries increased until cottonseed oil could no longer supply the demand.[13/] The greatest increase was in the amount used in the manufacture of oleomargarine which increased from 1 percent in 1931 to 9 percent in 1938. Other edible products took twice the amount in 1938 as compared to 1931. (Table 12).

The Competition of Cottonseed Oil

Factory consumption of fats and oils used in the production of compounds and vegetable cooking fats from 1912 to 1938 gives the chief competitors of cottonseed oil.[14/] It is in compound production that

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13/ Fats and Oils Situation, July 1939, p. 29.

14/ Ibid. May 1939, pp. 7-9.

Table 12. Factory Consumption by Classes of Products and Total Disappearance of Cottonseed Oil, United States, 1931-1938

(000,000 Pounds)

Products Using Cottonseed oil	Year							
	1931	1932	1933	1934	1935	1936	1937	1938
Compound and Vegetable Cooking Fats	928	854	853	1,059	992	919	1,163	1,040
Oleomargarine	16	15	18	55	99	108	174	143
Other Edible Products	84	100	122	155	139	178	227	198
Soap	2	4	7	3	2	2	3	3
Paint and Varnish	1/	1/	1/	1/	1/	1/	1/	1/
Printing Ink	1/	1/	1/	1/	1/	1/	1/	1/
Miscellaneous	2	2	3	3	4	2	3	3
Foots and Loss	108	129	113	103	104	94	113	142
Total Factory Consumption	1,140	1,084	1,116	1,378	1,340	1,303	1,688	1,529
Total Apparent Disappearance	1,315	1,240	1,295	1,566	1,441	1,340	1,746	1,665
	As Percent of Total Disappearance of Cottonseed Oil							
	(Percent)							
Compound and Vegetable Cooking Fats	71	67	66	68	69	69	67	62
Oleomargarine	1	1	1	3	7	8	10	9
Other Edible Products	6	8	9	10	10	13	13	12
Unaccounted for	14	14	15	12	7	3	4	9
Foots and Loss	8	10	9	7	7	7	6	8

SOURCE: Fats and Oils Situation, No. 26, United States Department of Agriculture, Bureau of Agricultural Economics, April 14, 1939.

1/ Less than 500,000 pounds.

cottonseed oil has its greatest demand. The major domestically produced oils are from peanuts, soybeans, linseed, and corn. Soybean oil is likely to be the chief competitor as it is adapted to production in the north as well as in the south,[15] and it can be grown on many types of soil, especially sandy and acid soils. It has begun to replace other legumes in these types of soils areas.[16] Soybean oil production in the United States was of minor importance until the World War, and resumed a small place in the domestic economy until the advent of the Agricultural Adjustment Administration in 1933. Foreign produced oils that compete directly with cottonseed oil in the manufacture of compounds and vegetable cooking fats are palm, cocoanut, and sesame oils which make up more than 75 percent of all foreign oils used. The largest percentage of cottonseed oil used in compound manufacture was in 1912 when it was 92.1 percent of the total consumption of fats and oils.

As a large percentage of the cottonseed oil produced is consumed in the compound industry, cottonseed oil is in direct competition with lard or lard compounds. The basic materials used in the manufacture of lard and lard compounds are hog fat and vegetable oils. The volume produced tends to fluctuate, but the supply is not so much influenced by price of these by-products as factors largely independent or indirectly connected determine the supply.[17]

15/ Agricultural Statistics, 1940, United States Department of Agriculture, p. 307.

16/ J. W. Zahnley, Soybean Production in Kansas, Kansas Experiment Station Bulletin No. 287, 1939, p. 5.

17/ The supply of lard is determined by the number of hogs slaughtered which is primarily dependent upon the price and supply of corn.

The per capita demand as measured by the per capita disappearance has been very inelastic. (Table 13). Since 1912 per capita consumption of these fats has average approximately 22 pounds. The average approximated the high as total consumption exceeded 23 pounds for only two years. The price of lard has ranged from 28.9 cents in 1919 to 5.0 cents in 1932. Consumption during the peak in prices in 1919 exceeded consumption in 1932 when the price of lard reached the low of 5.0 cents. Domestic production has exceeded domestic disappearance of lard, as contrasted to compounds and vegetable cooking fats wherein domestic production has tended to equal consumption of compounds and vegetable cooking fats. This was especially true after 1920. In 1912 the United States had a net export of vegetable oils of 188 million pounds but has remained on a net import basis since 1914, with the exception of 1921 when 23 million pounds were exported. (Table 14). If measured by the relative changes the demand for compound appears more inelastic than the demand for lard. This can probably be attributed to the fact that during periods of high lard prices the demand for lard was not shifted to vegetable compounds which were cheaper as a change in the relative price of the two products would not cause an immediate shift because of consumer preference. In this case, a smaller amount or a cheaper grade would probably be taken rather than a substitute product. Consequently, the price for vegetable compounds or lard will not be affected so much by the total supply as by the demand for the individual product. Therefore, the price is more closely correlated with the index of industrial activity than the existing demand or supply schedule. 18/

18/ Federal Reserve Bulletin, February 1941, p. 153, and August 1940, pp. 825 and 764.

Table 13. Lard, Compounds, and Vegetable Cooking Fats: Per Capita Production, Disappearance and Price in the United States, 1912-1937

Year	Lard			Compound and Vegetable Cooking Fats			Total Disappearance
	Per Capita Production	Per Capita Disappearance	Average Price Per Pound 1/	Per Capita Production	Per Capita Disappearance	Average Price Per Pound 1/	
	(Pounds)	(Pounds)	(Cents)	(Pounds)	(Pounds)	(Cents)	(Pounds)
1912	17.2	11.4	10.5	9.2	8.4	8.1	19.8
1913	16.9	10.9	11.0	10.4	9.7	8.7	20.6
1914	15.7	10.9	10.4	11.6	11.0	8.1	21.9
1915	16.8	11.8	9.4	10.8	10.2	7.9	22.0
1916	16.7	12.0	13.5	10.2	9.7	12.1	21.7
1917	14.1	10.5	21.9	11.5	11.0	17.3	21.5
1918	18.2	12.3	26.0	11.1	10.6	25.1	22.9
1919	18.1	11.0	28.9	12.9	11.7	25.2	22.7
1920	18.2	12.2	19.9	7.0	6.7	19.4	18.9
1921	19.3	11.1	11.1	7.5	7.1	10.3	18.2
1922	20.8	13.5	11.5	7.1	6.8	12.0	20.3
1923	24.1	14.5	12.3	6.7	6.6	12.9	21.1
1924	23.3	14.5	13.1	7.3	7.1	13.0	21.6
1925	18.6	12.5	16.7	10.0	9.8	13.0	22.3
1926	18.7	12.4	15.0	9.8	9.6	13.8	22.0
1927	19.0	12.8	12.8	10.0	9.8	11.8	22.6
1928	20.3	13.3	12.3	9.5	9.4	12.0	21.7
1929	20.0	12.9	12.0	10.0	9.9	11.5	22.8
1930	17.9	12.7	10.9	9.8	9.8	10.5	22.5
1931	18.4	13.5	8.0	9.4	9.4	8.9	22.9
1932	18.8	14.3	5.0	7.6	7.5	6.2	21.8
1933	19.4	13.9	5.6	7.6	7.6	7.0	21.5
1934	16.3 2/	12.8 2/	7.7 2/	9.5 2/	9.5 2/	8.6 2/	22.3 2/
1935	9.9 2/	9.5 2/	13.8 2/	12.1 2/	12.1 2/	13.1 2/	21.6 2/
1936	13.0 2/	11.2 2/	11.3 2/	12.4 2/	12.4 2/	12.2 2/	23.6 2/
1937	11.1 2/	10.6 2/	11.5 2/	12.3 2/	12.3 2/	12.4 2/	22.9 2/
1938	13.4 3/	11.2 3/	8.0 3/	11.6 3/	11.6 3/	10.2 3/	22.8 3/
1939	15.5 3/	12.7 3/	6.4 3/	10.7 3/	10.7 3/	9.3 3/	23.4 3/

SOURCE: "Production and Disappearance," Fats and Oils Situation, United States Department of Agriculture, Bureau of Agricultural Economics, July 1940, p. 13.

1/ American Vegetable Shortening Industry, pp. 344 and 347, (Years 1912-1933).

2/ Fats and Oils Situation, October 14, 1938, pp. 10-11, (Years 1934-1937).

3/ Prices, Lard, and Compounds, Fats and Oils Situation, July 1940, p.16.

Table 14 . Summary of Production, Net Imports, and Apparent Disappearance of Fats and Oils, Excluding Lard and Butter, United States, 1912, 1914, and 1916-38

(Net exports are indicated by a minus sign)
(Millions of Pounds)

Calendar Year	Domestic Production: From Domestic Materials	Domestic Production: From Imported Materials	Domestic Production: Total	Net Exports or Net Imports of Oil	Apparent Disappearance
1912	1,823	209	2,699	- 188	2,511
1914	2,146	301	3,190	- 3	3,187
1916	1,827	457	3,121	165	3,285
1917	1,711	534	2,976	554	3,495
1918	1,629	529	3,010	748	3,793
1919	1,837	476	3,182	369	3,465
1920	1,363	538	2,884	281	3,062
1921	1,589	428	3,095	- 23	3,192
1922	1,209	336	2,961	357	3,529
1923	1,267	760	3,303	424	3,697
1924	1,552	670	3,520	352	3,835
1925	2,180	472	3,871	520	4,382
1926	2,283	646	4,221	608	4,522
1927	2,254	795	4,333	619	4,682
1928	2,042	694	3,945	710	4,833
1929	2,067	880	4,234	1,052	5,113
1930	2,030	694	4,000	920	4,761
1931	1,949	587	3,784	816	4,482
1932	1,922	457	3,572	601	4,017
1933	1,764	630	3,700	841	4,214
1934	1,534	617	3,673	751	4,757
1935	1,612	748	3,510	1,717	5,314
1936	1,847	729	4,055	1,490	5,625
1937	2,148	931	4,487	1,690	5,832
1938	2,377	667	4,617	1,086	5,592

SOURCE: Fats and Oils Situation, July 1939, Bureau of Agricultural Economics, United States Department of Agriculture.

Factors Affecting Competition of Vegetable Oils

There are many properties or characteristics inherent in fats and oils that limit their uses commercially. These are, the iodine count, odor, color, and aperient properties; the latter applies to tung, castor, and croton oils, which prohibit their use as a food. On the basis of these properties especially iodine-count, the oils and fats are classified into three specific classes of drying, semi-drying and non-drying groups,[19] and are further classified according to use: edible, technical, and special. The edible oils are generally semi-drying and non-drying while technical oils are drying and semi-drying. However, a small number of vegetable oils is confined to one use class.

The discovery of new methods of processing has increased the multiplicity of uses and the substitutability of one vegetable for another. Many of the semi-drying and non-drying oils can be hardened by hydrogenation, thereby extending their uses and increasing changeability. Thus linseed oil by far the most widely used non-drying vegetable oil in paint and varnish manufacture must compete with such oils as soybean, cottonseed, castor, and oiticica which can be hardened by hydrogenation.[20] An analysis of the elasticity or inelasticity of demand or supply of any particular oil would involve many factors because of the substitutability of one oil for another. However, factors relative to production as they may affect supply are to be considered.

19/ Fats and Oils, and Oleaginous Raw Materials-Production, Prices, Trade, Disappearance in the United States, 1912-1935, United States Department of Agriculture, Statistical Bulletin No. 57, pp. 1-5.

20/ Fats and Oils Situation, May 1940, p. 11.

Cottonseed Production Versus Production of Principal Competiting Products

Cottonseed, a joint product of cotton lint, has generally been considered of very little value. This value relationship in the minds of producers can probably be attributed to the relative values of the two products, cotton lint and cottonseed. As a result of the value relationship very little attention has been given to cottonseed production, except in breeding work where the primary objective has been to reduce the relative weight of the seed in proportion to the lint weight per one hundred pounds of seed cotton thereby reducing still further the relative value of cottonseed to lint.

Studies have been made of the composition of the cottonseed in relation to varieties.[21] Other studies have attempted to discover the factors that are responsible for the variation in meal and oil content within a season and from one season to another.[22] As yet no experiments have been conducted to breed cotton for seed production alone. Mr. Henry Dunlavy of the Agronomy Department, Oklahoma Agricultural and Mechanical College, Stillwater reports that there is some interest manifested in this particular phase of cotton breeding, but no scientifically conducted experiments have been inaugurated.

Cottonseed oil has been the most important of the four by-products, oil, cake or meal, linters, and hulls, secured in the manufacture of

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21/ G. S. Fratz, Chemical Composition of the Cotton Plant, Texas Experiment Station Bulletin No. 247.

22/ G. S. Meloy, A Study of the Variable Composition of Cottonseed, Preliminary Report, Bureau of Agricultural Economics, United States Department of Agriculture, 1931.

cottonseed. The value ratio has changed from year to year, but as a general rule oil content per ton has twice the value of meal or cake. (Table 3). Hence, prices for raw cottonseed have been affected more by a change in cottonseed oil prices than by prices of any of the other three by-products. This applies especially in the central market, but in the local markets, which have been classified by Dickson[23/] as "decentralized markets" cottonseed prices may reflect the demand for meal or cake if consumption exceeds supply produced in the market area. (Tables 10,and 11).

The competitive status of domestically produced vegetable oils will be determined to a great degree by their methods of production as compared to cottonseed oil production. Soybeans, peanuts, and to a small degree flax seed have alternative uses. Soybeans and peanuts are used as human food and for livestock feed in the raw state both as hay and as protein supplements. However, as pointed out on page 88 the extent that the producer can shift to these different outlets will be determined at the time of planting.

The cost of producing these products, soybeans and peanuts, will be borne by the raw products if consumed in this State or by the by-products, oil and meal, if processed. Cottonseed on the other hand, will be produced as long as it is profitable to produce cotton lint. Consequently the demand for cottonseed oil will not affect the supply that will be offered. It would appear unlikely that cost of milling, refining, and processing soybean and peanut oil as compared to that

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23/ A. M. Dickson, Cottonseed Prices in the United States, 1934-35, Agricultural Adjustment Administration, United States Department of Agriculture, 1936.

for cottonseed oil would vary to the extent that these factors alone would eliminate cottonseed oil from the market.

When total domestic disappearance of fats and oils is taken as a measure of effective demand the extent of the market can soon be defined. In 1912 total disappearance of the fats and oils approximated five billion pounds[24] as the United States was on an export basis production exceeded domestic consumption by 772 million pounds. Domestic consumption continued to increase at a faster rate than production and in 1929 the United States imported 178 million pounds of fats and oils or their equivalents. In the same year animal fats primarily lard remained on an export basis and continued to do so until 1932 when 204 million pounds were imported. However, after 1936 the United States exported animal fats but was on a net import basis for vegetable fats and oils. The net import basis after 1929 was a result of an increase in consumption from the five billion in 1912 to approximately nine billion pounds in 1929 which continued to increase the following decade and reached 9.6 billion pounds in 1939.

Production of domestic fats and oils has been below or equaled to domestic consumption of these products with the one exception, lard.[25] Production of vegetable oils from domestic materials has not exceeded consumption despite the phenomenal increases in production of these products.[26] However, production of cottonseed oil has not increased. Consequently, soybean oil and peanut oil have found a ready demand as

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24/ Fats and Oils Situation, February 1941, p. 9.

25/ Ibid. July 1940, p. 13.

26/ Ibid. p. 13.

a result of the increase in consumption, and although cottonseed oil production prior to 1930 approximated 40 to 50 percent of total oil produced the amount was reduced to between 25 and 33 1/3 percent in 1939 This one factor alone probably attributed a great deal to the rise in cottonseed prices since 1910.

As has been pointed out the cottonseed oil supply is controlled by the amount of cotton produced primarily for the lint. And as the value of the seed is relatively small compared to the value of the lint, little, if any, consideration will be given to the price of seed when a decision is being made regarding the desirability of increasing or decreasing production of cotton by the individual producer. The supply of cottonseed oil then should be a constant factor if present agricultural programs continue. Cotton oil mills will likely continue processing seed as long as the total returns from the cottonseed by-products returns a net profit on the investment over a period of years. As cottonseed oil, a joint product, would be produced under wide variations in prices, even though low, and thus be absorbed under most market conditions. That is soybean oil, peanut oil, and linseed oil would compete among themselves for the "residual" share of the demand. Therefore, if the price of oil approached cost of production, cottonseed oil could under-sell any of the other products.

When the value of the by-products of cottonseed through competition of soybean, peanut, and linseed by-products reached cost of production (milling cost) which has averaged $7.54 [27/] per ton of raw cottonseed,

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27/ Cottonseed and Its Products, National Cottonseed Products Association, Inc., 1937.

the value of the seed in relation to lint will further decrease. The value of raw seed will approach zero, which will again place the entire burden of production of cotton on the lint as it was prior to the beginning of the cottonseed crushing industry. Therefore, it would seem that the position of cottonseed oil is impregnable from the standpoint of competition. The price will probably decrease as additional amounts of other domestic oils are produced unless consumption per capita increases still further.

The Competitive Status of Cottonseed Meal

The market for cottonseed meal has been unique in that the supply of its principal competitors was scarce in relation to the demand for a protein feed high in digestible nutrients for supplementary protein deficient rations. This position was maintained until the past decade. Its chief competitor has been linseed meal. However, soybean meal and peanut meal comprise a larger percentage of the total than linseed meal at present. Cottonseed meal was not the first protein concentrate feed used, as linseed meal feeding was introduced concurrent with that of cottonseed meal feeding.[28/] As cottonseed meal was more abundant it replaced linseed meal in most feeding practices, except in localities where linseed meal was more advantageiously located.[29/]

28/ Robert S. Curtis. Op. cit. pp. 89-90.

29/ Linseed meal is fed in many instances in preference to cottonseed meal which is more economical because of the higher protein content. This high rank is due to its palatability, conditioning, and slightly laxative effects, which aid in keeping stock thrifty and vigorous. F. B. Morrison, Feeds and Feeding, 20th Edition 1936, p. 531.

Many experiments have been made and are being made to determine the feeding value of the above protein supplement feeds. This feeding value has been and is yet the basis of demand where demand is rational. In the earlier experiments the objective was to discover to what extent these protein feeds could be used as protein supplement in feeding rations and replace carbohydrate concentrates. Henry and Morrison discussed this type of relationship in early editions of their publication, Feeds and Feeding. Later editions are more concerned with the relative value of the four products.

It will be necessary to know the relative feeding value of these products in order to place them on a comparable basis. In a majority of cases these feeds can be substituted directly for each other without any serious consequences, however, there are particular variations.[30/] Cottonseed has been found to be the best in mineral deficient rations, especially phosphorous.[31/] Linseed meal is superior when finish alone is considered.[32/] It also acts as a laxative but an excess in dairy feeds makes the butter soft, while cottonseed meal adds hardness and decreases churnability.[33/] In some cases it was found that a mixture of equal amounts of cottonseed meal and linseed meal gave the same results as linseed meal alone, and because of the relative value of the two feeds this provided a more economical feed.[34/] These protein supplements

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30/ The five major classes of livestock with which these experiments have been conducted are beef cattle, dairy cattle, sheep, horses, and hogs.

31/ Morrison. Op. cit. p. 668.

32/ Ibid. pp. 668 and 884.

33/ Ibid. p. 531.

34/ Ibid. p. 671.

have other substitutes which should be considered: principally, alfalfa, hominy, and gluten feeds. One hundred pounds of cottonseed meal can be substituted for 300 to 400 pounds of alfalfa hay.[35] Gluten feeds were found to be inferior to these concentrates but are widely used in some sections.[36]

Feeds possessing approximately the same feeding value can be readidly substituted for each other. However, other factors may disrupt this practice. These relationships can be changed by feeding carbohydrates and roughage of different compositions in the ration. Location advantages may eliminate or prohibit the substitution of another protein feed. Then again, irrational buying may result in failure to substitute feeds when it becomes economical to do so.

If these differences are not considered, the price of any one protein feed cannot remain out of line with the others for a very long period of time. Hence, there should be a positive correlation between the prices of these by-products. Table 15 gives the price by months for cottonseed, peanut, linseed, and soybean meal from 1930 to 1940. The supply of cottonseed meal was large relative to total demand, and cottonseed meal was relatively the cheapest product until 1937. Peanut meal prices closely approximated cottonseed meal prices after 1937. The significant change in price relationship for this period was narrowing of the spread between cottonseed meal and soybean meal prices.

In January of 1930 the spread was $16.35. (Table 15). Thereafter the absolute spread decreased but not the relative value of the spread.

35/ Morrison. Op. cit. 669.

36/ Ibid. p. 671.

Table 15. Price Per Ton of Cottonseed, Peanut, Linseed, and Soybean Meals at Specified Markets, by Months, 1930-1939

Year and Month	Cottonseed Meal, 41 Percent Protein, Memphis	Peanut Meal: f. o. b. Southeastern Milling Points 1/	Linseed Meal 34-37 Percent Protein, Minneapolis 2/	Soybean Meal, 41 Percent Protein, Chicago	Year and Month	Cottonseed Meal, 41 Percent Protein, Memphis	Peanut Meal: f. o. b. Southeastern Milling Points 1/	Linseed Meal 34-37 Percent Protein, Minneapolis 2/	Soybean Meal, 41 Percent Protein, Chicago
	(Dollars)					(Dollars)			
1930					1935				
Jan.	35.45	36.30	54.10	51.80	Jan.	34.60	32.70	43.25	40.70
Feb.	33.50	35.06	51.75	48.25	Feb.	33.25	31.25	39.65	38.45
Mar.	33.60	33.06	50.30	48.20	Mar.	30.80	29.12	38.40	37.10
Apr.	36.75	33.80	54.75	50.15	Apr.	30.45	28.12	38.80	33.80
May	38.05	34.75	48.70	50.70	May	30.00	27.33	36.00	33.20
June	35.50	33.75	44.75	48.75	June	26.95	26.25	31.00	31.70
July	33.60	31.50	42.75	46.00	July	24.30	24.00	26.50	29.05
Aug.	36.25	34.50	42.20	47.80	Aug.	21.50	20.83	25.30	24.00
Sept.	30.90	37.00	42.10	47.50	Sept.	20.30	19.16	24.88	22.85
Oct.	27.50	40.00	40.25	44.00	Oct.	23.15	20.65	27.40	25.60
Nov.	27.60	33.00	38.90	41.20	Nov.	22.25	19.56	26.63	24.40
Dec.	25.60	27.70	37.90	40.00	Dec.	22.20	19.05	27.00	25.50
1931					1936				
Jan.	25.75	26.19	36.40	39.30	Jan.	21.20	19.83	27.13	25.15
Feb.	24.90	27.00	34.65	36.60	Feb.	20.60	20.00	25.50	23.90
Mar.	26.45	26.50	31.60	33.15	Mar.	20.10	21.00	24.20	22.30
Apr.	26.25	26.80	30.75	31.90	Apr.	21.40	20.83	25.03	23.30
May	24.55	26.62	27.70	28.60	May	21.55	21.50	25.38	24.80
June	22.40	25.06	24.95	25.80	June	22.50	23.55	28.60	26.10
July	21.20	25.00	25.60	24.90	July	32.10	33.00	42.12	38.90
Aug.	17.30	23.00	26.20	23.35	Aug.	33.95	35.00	46.38	44.30
Sept.	13.80	18.80	25.75	21.40	Sept.	30.95	36.00	46.30	39.70
Oct.	13.20	19.00	25.70	18.60	Oct.	29.90	29.25	45.75	36.90
Nov.	16.60	20.00	31.40	23.85	Nov.	32.25	30.17	46.75	39.15
Dec.	14.45	18.81	32.10	23.00	Dec.	34.20	31.95	48.80	43.00
1932					1937				
Jan.	13.80	17.94 3/	30.15	20.45	Jan.	34.65	35.12	48.25	44.10
Feb.	12.80	18.00	28.75	18.75	Feb.	34.30	35.75	44.12	41.50
Mar.	12.45	18.30	28.00	18.90	Mar.	35.30	37.10	39.80	41.10
Apr.	12.85	17.88 4/	27.30	19.90	Apr.	40.15	44.25	40.50	47.60
May	12.60	17.88 4/	24.25	19.95	May	40.30	44.67	40.75	48.35
June	11.50	17.70 4/	21.40	20.20	June	34.55	42.35	38.00	39.20
July	13.15	16.69	20.40	20.05	July	31.55	37.75	34.62	37.30
Aug.	17.35	17.40	21.40	22.60	Aug.	25.90	29.94	31.00	34.90
Sept.	16.75	19.00	22.40	23.70	Sept.	21.30	30.00	31.25	34.20
Oct.	14.40	18.50	21.50	22.75	Oct.	21.95	27.50	33.12	28.80
Nov.	13.35	15.44	19.80	21.70	Nov.	23.00	28.45	35.90	29.50
Dec.	11.80	14.75	19.15	21.70	Dec.	22.05	25.84	39.00	28.80
1933					1938				
Jan.	11.85	14.31	19.70	21.70	Jan.	23.25	26.00	42.00	30.00
Feb.	12.00	13.88	19.30	21.70	Feb.	22.30	26.25	42.60	29.60
Mar.	13.10	14.56	20.00	22.60	Mar.	21.90	26.15	41.40	28.10
Apr.	15.20	15.94	21.65	23.70	Apr.	21.40	23.38	41.75	26.00
May	17.50	19.30	25.20	28.30	May	20.80	21.70	44.00	26.30
June	18.60	20.33	27.50	28.85	June	21.20	22.00	41.10	25.30
July	27.65	29.58	37.40	39.20	July	23.25	24.31	41.40	26.95
Aug.	22.90	27.65	36.10	39.00	Aug	22.05	24.07	38.40	26.15
Sept.	18.40	24.17	31.75	34.85	Sept.	21.00	24.06	35.90	27.00
Oct.	16.70	23.08	31.70	31.70	Oct.	20.90	25.19	37.75	24.60
Nov.	19.25	25.05	31.90	30.15	Nov.	21.75	21.60	38.50	24.40
Dec.	19.25	25.88	31.65	30.50	Dec.	22.80	21.25	39.75	26.20
1934					1939				
Jan.	22.50	27.10	32.00	30.60	Jan.	22.60	21.50	40.50	26.50
Feb.	24.00	28.56	31.90	31.50	Feb.	21.50	20.69	38.75	24.70
Mar.	24.00	29.75	30.15	32.50	Mar.	22.20	20.50	38.50	24.45
Apr.	22.00	28.62	30.90	33.25	Apr.	23.20	20.75	38.00	24.70
May	21.25	27.65	29.20	33.60	May	23.65	21.15	37.80	26.30
June	23.25	27.58	32.25	34.50	June	23.05	21.00	37.40	25.95
July	27.05	27.42	33.40	34.50	July	21.55	21.00	33.10	24.70
Aug.	34.80	30.75	41.75	37.75	Aug.	21.15	21.05	28.20	25.70
Sept.	33.90	33.62	44.00	39.50	Sept.	26.05	29.06	34.50	33.70
Oct.	33.90	33.20	41.40	38.50	Oct.	25.25	-	33.10	28.30
Nov.	37.00	31.25	42.00	38.85	Nov.	28.25	-	33.40	32.70
Dec.	37.75	33.75	44.30	41.20	Dec.	29.50	-	35.50	34.95

Source: Agricultural Statistics 1940, United States Department Of Agriculture

While the spread was less than 50 percent of the cottonseed meal price as of that date it was above 90 percent on December of 1932. However, this soon changed and by 1939 the average spread approximated five dollars. Proportional price changes have not occurred for either peanut or linseed meal. Peanut meal prices were slightly above cottonseed meal in 1930 but by the end of December 1938 they were below cottonseed meal prices. The price for linseed meal has remained near the 1930 level, and in the last two years of the decade studied 1930-1939, was considerably higher than prices of other feeds.

The new price relationships can be partially attributed to the relative position of the different protein feeds in the total amount consumed. (Tables 16 ,and 17). The average consumption of cottonseed meal for the five years, 1928-1932, was 1,823 thousand tons excluding that domestically used for fertilizer. The total consumption of linseed, soybean, and peanut meal was 543.4 thousand tons or less than 25 percent of the total disappearance of the four protein feeds. In 1935 the amount of soybean meal domestically consumed was 619.9 thousand tons which exceeded the combined average consumption of linseed, peanut, and soybean meal for the period 1928-1932. In the meanwhile linseed meal production had actually decreased compared to the five year average, 1928-1932. This increase in the domestic consumption of soybean meal was 600 percent, but compared to total consumption of the four products, the volume was insignificant. Production of cottonseed meal decreased in 1935 to 1,739 thousand tons as compared to the five-year average of 2,235 thousand tons. Domestic disappearance excluding quantity used for fertilizer was 1,726 thousand tons. Seven thousand tons were exported in 1935 as compared to 165 thousand tons for the

Table 16. Cottonseed and Peanut Cake and Meal
United States, Average 1928-32, Annual 1933-40

Year Beginning August 1	Cottonseed Cake and Meal: Production	Net Exports	Used for Fertilizer on Cotton Farms	Domestic Disappearance Excluding Quantity Used for Fertilizer	Peanut Cake and Meal: Production	Imports 1/	Domestic Disappearance
	(1,000 tons)						
Average 1928-32	2,235	165	222	1,823	16.1	4.1	20.2
1933	1,889	70	174	1,679	10.2	1.2	11.4
1934	1,614	-48	85	1,504	45.6	3.5	49.1
1935	1,739	7	139	1,726	47.9	1.9	49.8
1936	2,031	-25	84	1,995	59.4	9.6	69.0
1937	2,850	87	203	2,367	50.0	2.1	52.1
1938	2,023	10	93	2,014	65.4	10.5	75.9
1939	1,880	-22	75	1,865	30.3	9.7	40.0
1940 2/				1,865	125.0	10.0	135.0

SOURCE: The Feed Situation, March 1931, Bureau of Agricultural Economics, United States Department of Agriculture.

1/ Imports from 1934 to date are on an October-September basis. Reports for earlier years are on a calendar-year basis.

2/ Preliminary estimate.

period 1928-32. Since 1932 exports have been very small; in 1934, 1936, and 1939 the United States imported cottonseed meal. (Table 16).

Soybean meal has been imported but imports have decreased and in 1938 and 1939 the United States was on a net export basis. Domestic production of cottonseed meal has decreased but domestic consumption has approached the five-year average for 1928-32. The same trend is characteristic of linseed meal, but soybean meal production has continually increased at a very accelerated rate. Production decreased in 1936 slightly from the high of 1935 but increased in 1937 and 1938 over

Table 17. Linseed and Soybean Cake and Meal: Apparent Domestic Disappearance, Average 1928-32, Annual 1933-40

Year Beginning October 1	Linseed Cake and Meal: Production	Imports	Exports	Domestic Disappearance	Soybean Cake and Meal: Production	Imports	Exports	Domestic Disappearance
	(1,000 tons)							
Average 1928-32	517.0	19.2 1/	227.1	309.1	71.4	42.8		114.2
1933	375.2	8.7	241.7	142.2	73.9	25.0		98.9
1934	397.6	10.2	205.5	202.3	223.0	64.2		287.2
1935	456.9	17.2	210.6	263.5	599.9	20.0		619.9
1936	586.2	15.9	328.7	273.4	492.3	55.7		548.0
1937	412.0	5.3	240.3	177.0	717.2	15.5		732.7
1938	481.4	7.8	286.6	202.6	1,076.4	12.3	27.0 2/	1,061.7
1939	538.8	1.3	146.7	393.4	1,349.4	12.1	62.3	1,299.2
1940				600.0 3/				1,325.0 3/

SOURCE: The Feed Situation, March 1941, Bureau of Agricultural Economics, United States Department of Agriculture.

1/ Imports for 1928-29 estimated.

2/ January-October 1939; not separately reported prior to January 1939.

3/ Preliminary estimate.

the high of 1935. In the succeeding year production of soybean meal exceeded one million tons in the United States for the first time in the history of soybean production. (Table 17).

Factors Affecting Production

Cottonseed meal is a by-product of a subordinate joint-product. The total production is not determined by a conscious cognizance of the price level or profitableness in the cottonseed industry proper. Production is determined by the amount of cotton produced. Production data

for cottonseed are estimated by assuming 65 pounds of seed are produced for each 35 pounds of lint. Meanwhile soybean meal, linseed meal, and peanut meal production are a result of a planned enterprise in the agricultural economy. However, linseed meal is a by-product of flax seed, crushed primarily for the oil. The production of flax in the United States has emphasized the returns from the crushing industry, as very little flax is produced for linen. Soybeans have been and are produced today for the hay but the principal crop is the beans. And unlike cottonseed the total production will be determined by how profitable it is to produce soybeans as such, and not as is in the case of cottonseed which depends upon the profitableness of producing the joint-product.

Soybean production although not confined to any particular region is found mostly in the North Atlantic, North Central, and South Atlantic States.[37] This closely corresponds with areas in which the largest acreage of corn is grown.[38]

Soybean acreage has increased from 1.6 million acres in 1924 to 9 million in 1939. In the meanwhile soybean seed production increased from 4.9 million bushels in 1924 to 87 million bushels in 1939.[39] Compared on a percentage basis acreage increased 575 percent while soybean seed production increased 1,766 percent. Evidently acreage has been shifted from hay production to seed production. This is verified by the increase in average meal production from 71 thousand tons in the period 1928-1932 to 1.3 million tons in 1939.

Some varieties of soybeans are adapted to both hay and seed while others are strictly hay or seed varieties.[40] This is important when

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37/ Agricultural Statistics, 1940, p. 307.

38/ Ibid. p. 47.

39/ Ibid. pp. 306 and 308.

40/ Zahnley. Op. cit. pp. 26-27.

making any estimate of the total supply of soybeans forthcoming into the market as the flexibility of the supply will depend upon the acreage planted to the dual varieties. If the demand for protein feeds results in a relatively advantageous position for soybeans whereby the seed can be sold profitably, more could be harvested for seed to alleviate the immediate situation. To a limited degree these same general limitations apply in the case of peanut meal production.

The cottonseed meal supply, a by-product of a joint-product, is dependent upon the acreage planted to cotton. If it is profitable to produce cotton lint seed will be produced, as cotton will not be grown for the seed alone, unless the value relationship is reversed between cotton lint and seed. If the present agricultural programs are continued and the market for American cotton remains about the same, approximately 12 million bales will be produced. The supply of cottonseed meal should then be about the average for the period 1933 to 1940, which was slightly less than two million tons.

Because of the substitutability of one protein supplement for another there will not be a demand for a particular protein feed, assuming rational purchasing, but a demand for protein feeds in general. Consequently a demand for cottonseed meal will be a demand for protein supplement feeds. However, an analysis of supply and the ramifications affecting supply of cottonseed meal and other protein feeds do not follow the same pattern as demand. As previously pointed out the supply of cottonseed meal is in no way related to demand in that an increase or decrease in demand would not result in a smaller amount being offered, unless the relation of lint value to cottonseed value were reversed or the ratio of seed value to lint value became very narrow.

Thus it would seem that the total supply offered in the market approximately two million tons will be supplied by cottonseed meal regardless of the price established. In this case the demand for protein feeds other than cottonseed meal will be a residual share of the total demand. Competition then will be limited to soybean, peanut, and linseed meal for this residual share of the total demand.

Little is known as to what extent potential supplies of the principal protein feeds might be increased or decreased nor the total demand for these products, but if past trends are indicative of future production the supply will continue to increase fastern than demand. (Tables 16, and 17). In this case, as soybeans have become the second important source of protein supplement feeds, prices of protein feeds should approximate the cost of production of soybeans. This does not mean that the cost of production of soybeans will set the price of the protein supplement feeds, as cost incurred in production cannot directly affect the price for which the meal is sold. Actual production cost will not be reflected exactly in the price-supply relation as soybeans are recognized by the Agricultural Adjustment Administration as either a neutral or soil building crop. 41/

The problem confronting the cottonseed industry is how will these relationships affect present price relationships between the raw product, cottonseed, and the by-products. The producer-consumer of cottonseed in the producing areas will be vitally affected by any change in the raw product and the by-product price relationship. Increased production of protein feeds other than cottonseed meal would in effect be

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41/ This give soybeans an indirect or direct subsidy.

the same as increasing cottonseed meal production. In the past large supplies of raw cottonseed have resulted in low prices for cottonseed, also the spread between raw cottonseed and cottonseed meal prices has increased. However, this last relationship would not necessarily follow when the supply of protein feeds, other than cottonseed meal is increased. If the demand for vegetable oils continues to exceed and increase faster than the domestic supply, prices for oil will likely remain fairly stable. As oil is the principal by-product of cottonseed from the standpoint of value, cottonseed meal prices would decrease in greater proportion than prices for raw cottonseed. It is probable that raw cottonseed and cottonseed meal prices will tend to equate with large supplies of protein supplement feeds thereby increasing the exchange value of the raw product to the producer-consumer. Concurrent with an increase in the exchange value of the raw product for its by-product its actual exchange value will have decreased in the market.

Summary

Many factors contributed to the shifting of centers of production for agricultural products both animal and crops. The opening up of new lands in the Mississippi River Valley and the North Western Territory, the development of railroad transportation, establishing of communications, and the outlets created by the export markets, were the chief factors. To meet the demand for livestock products in the domestic markets and abroad, manufacturers of lard resorted to adulteration of lard with vegetable oils.

Cottonseed oil prices were relatively low as compared to lard and cottonseed oil made a desirable substitute for the more expensive

product, lard. However, processing techniques have been developed whereby the inherent properties of vegetable oils no longer limit so much the use or the field of competition. The principal competing products for the compound market are lard and cottonseed oil. Both products are subordinate joint-products. Hence the supply offered is not influenced much by an increase in demand. The production of domestic vegetable oils has not increased as fast as demand probably because the price level has been very low as a result of a large lard surplus.

The supply of cottonseed meal is determined by the amount of cotton produced. It must compete directly with other protein supplement feeds produced for a specific market. As the demand for protein feeds exceeds supply of cottonseed meal the price will be determined by the relationship of demand and supply of protein feeds other than cottonseed meal.

The position of cottonseed meal in the market appears to be impregnable in that the cost of production will not limit the supply if past lint-seed value ratios are approximated. The component price for the by-products of cottonseed may tend to approach cost of processing if competition from other sources becomes acute.

As the domestic consumption of vegetable oils exceeds domestic production an increase in production would not depress the price of cottonseed oil in proportion to the meal by-product of which there is a surplus. The exchange ratio between raw cottonseed and cottonseed meal will be favorable for the producer-consumer. However, to the South as a whole a decrease in the price of cottonseed will decrease the actual income from seed as a majority of producers market the cottonseed and do not exchange it for the by-product cottonseed meal.

CHAPTER VII. SUMMARY AND CONCLUSIONS

This paper has attempted to discover the factors that affect the price of and the method of marketing cottonseed in the local markets of Southwestern Oklahoma. It was anticipated that the method of marketing would be influenced by the seasonal nature of production, the trend of prices, and the relation of the local market to the gin. Price of cottonseed were studied in relation to volume ginned, seasonal variation of the crop movement, supply and demand relationship, and the effects of competition from competing products.

Cottonseed prices were found to be directly correlated with the composite price of the by-products of cottonseed. However, prices for cottonseed followed more closely changes in the price of cottonseed oil, except in seasons when cottonseed production in Oklahoma was less than consumption. Under this condition, cottonseed prices followed very closely cottonseed meal prices as the two prices tended to equate. Oklahoma is generally classified as a surplus producing area; consequently, the oil price has been the most important factor affecting the price of cottonseed in Oklahoma.

The market for cottonseed since the day of its origin has been directly connected with the ginning industry. It will likely continue to be associated with the gins primarily because the oil mills own and operate most of the gins. Hence, they would not be inclined to let a separate marketing agency handle the seed as they would lose control of the seed in the local market. Consequently the farm price of cottonseed was found to be directly affected by the gins' operating policy.

The gins in the southern counties paid, on the average, two dollars a ton more for seed than gins in the northern counties. Although the southern gins received a slightly higher mill price, this fact alone did not cause all the discrepancy. The southern gins retained less margin in seed purchased. The size of margins were associated with volume ginned as margins were found to decrease as volume increased. When volumes ginned were compared it was found that the southern gins averaged about 300 bales more per plant. At the present there are no official price quotations for cottonseed in Southwestern Oklahoma. It seems that price quotations would improve the present marketing system. The Agricultural Marketing Service should be designated as the agency to furnish the information as this is one of the many functions of this agency. For the information to be of value to the producers the price should be furnished at least twice weekly during the active ginning season.

Because of the failure to allocate to cottonseed the returns it actually produces and because of the fact that it has been forced to shoulder some of the burden of over-expansion in the ginning industry a marketing agency independent of the ginning industry is needed for the local market. However, with the present gin storage facilities, a separate marketing agency would be an additional cost which would have to be borne by the cottonseed industry. But it is unfortunate that cottonseed may be forced to bear a part of the cost of gin operation. If it were not for the returns derived from merchandizing cottonseed many of the present gins would likely have been liquidated and have relieved the cottonseed industry of this burden.

In an analysis of the quality and price variations of cottonseed, it was found that the price trend and grade index were directly correlated, although the price did not equal the basis grade price as was determined by chemical analysis. The cottonseed crushing industry in Oklahoma contended that the formula developed by the Department of Agriculture was not suitable for Oklahoma conditions because of differences in the seed composition. Although a grading system would be desirable for price quotations, it may not be feasible. A quotation system based, however, on the large spot market prices should prove beneficial to producers and ginners.

The market for cottonseed is dependent upon the market for its by-products. The oil and meal are the principal products of raw cottonseed from the standpoint of value and any subsequent change in the price relationship will be reflected in raw cottonseed prices. Consumption of these by-products has been constantly increasing and exceeds the supply of either the oil or the meal produced. As the supply is interdependent of demand it has failed to respond to the increase in consumption. Consequently, other vegetable oils have entered the market and have supplemented the supply of these products produced from cottonseed.

The principal competing vegetable oil and vegetable meal products are derived from soybeans. Production of soybeans for crushing has increased almost 2,000 percent and has displaced cottonseed products in a few industries and localities. Because of the fact that soybeans are recognized as a neutral or soil building crop by the Agricultural Adjustment Administration, production will likely be increased even after the cost of production becomes prohibitive. However, it appears that the

position of cottonseed by-products will be impregnable in the market as they are joint products of comparatively small value while other products must bear all production costs.

The value of cottonseed by-products will likely decrease and tend to approach the cost of production of soybean by-products. But it does not seem that soybean competition can drive cottonseed by-products from the market because of the joint-cost relationship. In localities where the producer of cottonseed is also the consumer (indirectly by feeding livestock) he should benefit by this decrease in price as the exchange value of his raw product for the by-products will increase. To the South as a whole the decrease in value from competition will result in a lower farm income from cottonseed.

APPENDIX

Table 1. Oklahoma Farm Prices for Cottonseed by Months, 1927-1938

Year	January	February	March	April	May	June	July	August	September	October	November	December
1927	14.90	16.40	18.00	19.00	20.50	21.40	21.00	21.40	32.90	36.50	37.20	38.00
1928	36.50	36.00	36.00	38.00	43.00	39.00	38.00	35.00	29.00	33.00	36.00	35.00
1929	35.00	35.00	36.00	35.50	35.00	34.00	33.00	33.00	30.00	31.00	31.00	31.00
1930	31.00	32.00	30.00	31.00	31.00	30.00	27.00	25.00	24.00	23.00	23.00	22.00
1931	22.00	22.00	23.00	22.40	22.00	20.10	18.50	15.00	18.00	6.50	10.90	10.10
1932	9.60	9.10	8.80	8.70	8.50	8.10	8.10	8.10	9.10	8.80	7.80	7.60
1933	7.50	7.60	8.00	9.00	11.00	11.00	16.00	16.00	10.00	10.10	11.50	12.90
1934	13.00	16.00	17.75	18.25	20.00	19.50	20.00	24.00	31.00	35.00	38.00	38.00
1935	38.00	38.00	39.00	38.00	38.00	36.00	32.00	29.00	26.00	29.00	31.00	30.00
1936	28.00	27.00	28.00	28.00	27.00	25.00	28.00	30.00	30.00	30.00	29.00	30.00
1937	32.00	33.00	34.00	36.00	34.00	30.00	32.00	26.00	18.00	17.00	18.00	18.00
1938	18.00	19.00	20.00	19.00	20.00	20.00	20.00	19.00	19.00	20.00	21.20	21.00
						Relatives						
1927	5.01	5.52	6.06	6.39	6.90	7.20	7.06	7.20	11.07	12.28	12.52	12.78
1928	8.40	8.28	8.28	8.75	9.90	8.98	8.75	8.05	6.67	7.59	8.28	8.06
1929	8.76	8.76	9.01	8.89	8.76	8.51	8.26	8.26	7.51	7.76	7.76	7.76
1930	9.42	9.73	9.12	9.42	9.42	9.12	8.21	7.60	7.29	6.99	6.99	6.99
1931	10.97	10.97	11.47	11.17	10.97	10.02	9.23	7.48	3.99	3.24	5.44	5.04
1932	9.39	8.90	8.61	8.51	8.31	7.92	7.92	7.92	8.90	8.61	7.63	7.43
1933	5.74	5.82	6.13	6.89	8.43	8.43	12.25	12.25	7.66	7.74	8.81	9.88
1934	4.47	5.51	6.11	6.28	6.88	6.71	6.88	8.26	10.67	12.05	13.08	13.08
1935	9.40	9.41	9.65	9.41	9.40	8.91	7.92	7.18	6.43	7.18	7.67	7.42
1936	8.24	7.94	8.24	8.24	7.94	7.35	8.24	8.82	8.82	8.82	8.53	8.82
1937	9.76	10.06	10.57	10.98	10.37	9.15	9.76	7.93	5.49	5.18	5.49	5.49
1938	7.66	8.05	8.47	8.05	8.47	8.47	8.47	8.05	8.05	8.47	8.98	8.89
Total	97.22	98.95	101.72	102.98	105.75	100.77	102.95	99.00	92.55	95.91	101.18	101.64
Average	8.10	8.25	8.49	8.58	8.81	8.40	8.58	8.25	7.71	7.99	8.43	8.47
Adjusted Relative	96.6	98.4	101.3	102.3	105.1	100.2	102.3	98.4	92.0	95.3	100.6	101.0

SOURCE: Trimble R. Hedges and K. D. Blood, Oklahoma Farm Price Statistics, 1910-38, Experiment Station Bulletin No. 238, p. 25.

Table 2 . Oklahoma Farm Prices for Cottonseed in Years When Cotton Production Exceeded One Million Bales

Year	January	February	March	April	May	June	July	August	September	October	November	December
1911	21.60	22.00	21.20	22.50	22.70	18.70	19.60	20.10	14.30	15.80	16.50	15.75
1912	15.50	16.10	16.50	17.70	19.50	17.50	18.40	16.50	17.20	16.10	17.20	17.90
1914	19.50	20.00	21.10	22.70	21.80	21.30	21.30	20.00	11.00	12.90	12.00	14.10
1919	60.10	57.30	58.50	60.00	61.70	59.80	57.70	60.00	61.80	61.70	61.00	59.30
1920	56.10	57.50	47.30	52.20	60.00	62.80	61.00	51.00	24.90	25.00	18.50	17.00
1924	42.00	41.30	40.00	41.00	41.50	40.00	40.00	39.75	33.00	32.00	30.90	32.50
1925	33.00	34.00	34.00	35.20	34.50	30.00	36.00	31.60	31.60	32.30	26.40	26.20
1926	26.40	26.50	27.10	28.20	26.20	26.70	26.00	28.10	24.60	17.20	15.60	14.40
1927	14.90	16.40	18.00	19.00	20.50	21.40	21.00	21.40	32.90	36.50	37.20	38.00
1928	36.50	36.00	36.00	38.00	43.00	39.00	38.00	35.00	29.00	33.00	36.00	35.00
1929	35.00	35.00	36.00	35.50	35.00	34.00	33.00	33.00	30.00	31.00	31.00	31.00
1931	22.00	22.00	23.00	22.40	22.00	20.10	18.50	15.00	8.00	6.30	10.90	10.10
1932	9.60	9.10	8.80	8.70	8.50	8.10	8.10	8.10	9.10	8.80	7.80	7.60
1933	7.50	7.60	8.00	9.00	11.00	11.00	16.00	16.00	10.00	10.10	11.50	12.90
						Relatives						
1911	9.36	9.53	9.19	9.75	9.84	8.10	8.49	8.71	6.20	6.85	7.15	6.83
1912	7.52	7.81	8.01	8.59	9.46	8.49	8.93	8.01	8.35	7.81	8.35	8.67
1914	8.96	9.19	9.69	10.43	10.01	9.78	9.78	9.19	5.05	5.93	5.51	6.48
1919	8.36	7.97	8.14	8.35	8.58	8.52	8.03	8.35	8.60	8.58	8.48	8.25
1920	10.52	10.78	8.87	9.79	11.25	11.78	11.44	9.56	4.67	4.69	3.47	3.19
1924	9.25	9.10	8.81	9.03	9.14	8.81	8.81	8.76	7.27	7.05	6.81	7.16
1925	8.57	8.83	8.83	9.15	8.96	7.80	9.35	8.21	8.21	8.39	6.39	6.81
1926	9.20	9.23	9.44	9.82	9.13	9.30	9.06	9.79	8.53	5.99	5.43	5.02
1927	5.01	5.52	6.06	6.39	6.90	7.20	7.06	7.20	11.07	12.28	12.52	12.78
1928	8.40	8.28	8.28	8.75	9.90	8.08	8.75	8.05	6.67	7.59	8.28	8.06
1929	8.76	8.76	9.01	8.89	8.76	8.51	8.26	8.26	7.51	7.76	7.76	7.76
1931	10.97	10.97	11.47	11.17	10.97	10.02	9.23	7.48	3.99	3.24	5.44	5.04
1932	9.39	8.90	8.61	8.51	8.31	7.92	7.92	7.92	8.90	8.61	7.63	7.43
1933	5.74	5.82	6.15	6.89	8.43	8.43	12.25	12.25	7.66	7.74	8.81	9.88
Total	120.01	120.69	120.54	125.51	129.64	123.44	127.36	121.74	102.68	102.51	102.03	103.36
Average	10.00	10.03	10.05	10.46	10.80	10.29	10.61	10.15	8.56	8.54	8.50	8.28
Adjusted Relative	103.2	103.7	103.7	107.9	111.4	106.2	109.5	104.7	88.3	88.1	87.7	85.4

SOURCE: Trimble R. Hedges and K. D. Blood, Oklahoma Farm Prices Statistics, 1910-38, Experiment Station Bulletin No. 258, p. 25.

Table 3 . Oklahoma Farm Prices for Cottonseed in Years When Cotton Production was Less Than a Million Bales

Year	January	February	March	April	May	June	July	August	September	October	November	December
1910	24.20	24.00	25.00	26.00	26.50	27.00	25.00	22.30	19.60	21.70	20.60	20.80
1913	19.60	18.30	19.00	20.20	20.60	20.40	17.40	20.50	19.50	21.40	20.20	20.00
1915	15.60	19.40	18.80	19.20	19.50	19.20	17.50	16.30	18.40	27.10	31.90	33.00
1916	33.50	33.40	32.80	32.80	34.60	29.40	31.43	33.50	37.40	42.60	52.00	51.00
1917	51.90	50.00	48.20	53.40	53.40	49.20	51.60	51.00	57.00	61.20	65.00	62.40
1918	60.40	58.60	60.20	64.40	60.00	60.00	53.75	58.60	63.10	63.90	62.20	61.00
1921	17.00	17.00	15.00	14.00	15.00	13.00	14.00	18.00	22.00	27.00	24.00	21.00
1922	27.00	25.00	26.00	34.00	35.00	33.00	30.00	25.00	20.00	29.00	36.00	38.00
1923	38.60	41.60	43.10	44.00	44.30	42.00	38.00	30.00	37.70	35.20	40.40	42.50
1930	31.00	32.00	30.00	31.00	31.00	30.00	27.00	25.00	24.00	23.00	23.00	22.00
1934	13.00	16.00	17.75	18.25	20.00	19.50	20.00	24.00	31.00	35.00	38.00	38.00
1935	38.00	38.00	39.00	38.00	38.00	36.00	32.00	29.00	26.00	29.00	31.00	30.00
1936	28.00	27.00	28.00	28.00	27.00	25.00	28.00	30.00	30.00	30.00	29.00	30.00
1937	32.00	33.00	34.00	36.00	34.00	30.00	32.00	26.00	18.00	17.00	18.00	18.00
1938	18.00	19.00	20.00	19.00	20.00	20.00	20.00	19.00	19.00	20.00	21.20	21.00
					Relatives							
1910	8.56	8.49	8.84	9.20	9.37	9.55	8.84	7.89	6.93	7.68	7.29	7.36
1913	8.27	7.72	8.01	8.52	8.69	8.61	7.34	8.65	8.22	9.02	8.52	8.43
1915	6.13	7.62	7.38	7.54	7.66	7.08	6.87	6.40	7.23	10.64	12.53	12.96
1916	7.54	7.51	7.38	7.38	7.78	6.61	7.07	7.54	8.41	9.58	11.70	11.47
1917	7.93	7.64	7.37	8.18	8.16	7.52	7.89	7.79	8.71	9.35	9.93	9.54
1918	8.32	8.07	8.29	8.87	8.26	8.26	7.40	8.07	8.69	8.80	8.57	8.40
1921	7.84	7.84	6.91	6.45	6.91	5.99	6.45	8.30	10.14	12.44	11.06	9.68
1922	7.54	6.98	7.26	9.50	9.78	9.22	8.38	6.98	5.59	8.10	10.06	10.62
1923	8.09	8.71	9.03	9.22	9.28	8.80	7.96	6.28	7.90	7.37	8.46	8.90
1930	9.42	9.73	9.12	9.42	9.42	9.12	8.21	7.60	7.29	6.99	6.99	6.69
1934	4.47	5.51	6.11	6.28	6.88	6.71	6.88	8.26	10.67	12.05	13.08	13.08
1935	9.40	9.41	9.65	9.41	9.40	8.91	7.92	7.18	6.43	7.18	7.67	7.42
1936	8.24	7.94	8.24	8.24	7.94	7.35	8.24	8.82	8.82	8.82	8.53	8.82
1937	9.76	10.06	10.37	10.98	10.37	9.15	9.76	7.93	5.49	5.18	5.49	5.49
1938	7.62	8.05	8.47	8.05	8.47	8.47	8.47	8.05	8.05	8.47	8.98	8.89
Total	119.13	121.28	122.43	127.24	128.37	121.30	117.68	115.74	118.57	131.67	138.86	137.75
Relative	7.92	8.08	8.16	8.48	8.56	8.09	7.84	7.72	7.90	8.78	9.26	9.18
Adjusted Index	95.1	97.0	98.0	101.8	102.7	97.1	94.2	92.6	94.9	105.4	111.1	110.2

SOURCE: Trimble R. Hedges and K. D. Blood, Oklahoma Farm Price Statistics, 1910-38, Experiment Station Bulletin No. 238, p. 25.

Table 4. Straight Line Trend of Weighted Weekly Average Farm Prices for Cottonseed, August 2, 1937 to March 4, 1938 by Least Squares Method

	Number	x	y 1/	xy	x^2	Normal Trend	Actual as Percent of Normal y ÷ n
Aug. 2-8	1	-15	24.27	-364	225	20.04	121.11
Aug. 10-16	2	-14	21.70	-304	196	19.96	108.71
Aug. 18-22	3	-13	21.12	-275	169	19.88	106.24
Aug. 24-29	4	-12	19.59	-235	144	19.80	98.94
Aug. 31-Sept. 4	5	-11	18.68	-205	121	19.72	94.72
Sept. 6-11	6	-10	17.87	-179	100	19.65	90.94
Sept. 13-18	7	- 9	17.17	-155	81	19.57	87.74
Sept. 20-25	8	- 8	16.79	-134	64	19.49	86.15
Sept. 27-Oct. 2	9	- 7	17.25	-121	49	19.42	88.82
Oct. 4-9	10	- 6	18.45	-111	36	19.34	95.40
Oct. 11-16	11	- 5	19.01	- 95	25	19.26	98.70
Oct. 18-23	12	- 4	18.83	- 75	16	19.18	98.18
Oct. 25-30	13	- 3	18.99	- 57	9	19.10	99.42
Nov. 1-6	14	- 2	19.71	- 39	4	19.03	103.57
Nov. 8-13	15	- 1	19.74	- 20	1	18.95	104.17
Nov. 15-20	16	0	19.77	0	0	18.87	104.77
Nov. 22-27	17	+ 1	19.45	+ 19	1	18.79	103.51
Nov. 29-Dec. 4	18	+ 2	19.43	+ 39	4	18.72	103.79
Dec. 6-11	19	+ 3	19.40	+ 58	9	18.64	104.08
Dec. 13-18	20	+ 4	19.44	+ 78	16	18.56	104.74
Dec. 20-25	21	+ 5	18.36	+ 92	25	18.48	99.35
Dec. 27-Jan. 1	22	+ 6	18.19	+109	36	18.40	98.86
Jan. 3-8	23	+ 7	17.71	+124	49	18.33	96.69
Jan. 10-15	24	+ 8	17.92	+143	64	18.25	98.19
Jan. 17-22	25	+ 9	17.94	+161	81	18.17	98.73
Jan. 24-29	26	+10	17.93	+179	100	18.09	99.11
Jan. 31-Feb. 4	27	+11	17.92	+197	121	18.02	99.44
Feb. 6-11	28	+12	18.01	+216	144	17.94	100.39
Feb. 13-18	29	+13	18.16	+236	169	17.86	101.68
Feb. 20-25	30	+14	18.35	+257	196	17.78	103.20
Feb. 27-Mar. 4	31	+15	17.89	+268	225	17.70	101.07
			585	-1,932	2,480		

$a = 18.872$ $b = -.0778$

1/ Cottonseed prices, weighted weekly average from schedules.

Table 5. Straight Line Trend of Weekly Average Cottonseed Oil Prices, August 2, 1937 to March 4, 1938 by Least Squares Method

	Number	x	y 1/	xy	x^2	Normal Trend	Actual as Per-cent of Normal y ÷ n
Aug. 2-8	1	-15	8.44	-127	225	7.702	111.32
Aug. 10-16	2	-14	8.21	-115	196	7.696	108.34
Aug. 18-22	3	-13	8.16	-106	169	7.691	107.78
Aug. 24-29	4	-12	7.96	- 95	144	7.685	105.18
Aug. 31-Sept. 4	5	-11	7.84	- 86	121	7.680	103.69
Sept. 6-11	6	-10	7.62	- 76	100	7.664	100.87
Sept. 13-18	7	- 9	7.43	- 67	81	7.668	98.40
Sept. 20-25	8	- 8	7.26	- 58	64	7.663	96.20
Sept. 27-Oct. 2	9	- 7	7.16	- 50	49	7.657	94.97
Oct. 4-9	10	- 6	7.34	- 44	36	7.652	97.42
Oct. 11-16	11	- 5	7.19	- 36	25	7.646	95.49
Oct. 18-23	12	- 4	7.42	- 30	16	7.640	98.60
Oct. 25-30	13	- 3	7.26	- 22	9	7.634	96.54
Nov. 1-6	14	- 2	7.19	- 14	4	7.629	95.66
Nov. 8-13	15	- 1	7.10	- 7	1	7.624	94.53
Nov. 15-20	16	0	7.11	0	0	7.618	94.71
Nov. 22-27	17	+ 1	6.90	+ 6	1	7.612	92.00
Nov. 29-Dec. 4	18	+ 2	7.10	+ 14	4	7.607	94.73
Dec. 6-11	19	+ 3	7.18	+ 21	9	7.601	95.85
Dec. 13-18	20	+ 4	7.09	+ 28	16	7.596	94.72
Dec. 20-25	21	+ 5	7.16	+ 36	25	7.590	95.74
Dec. 27-Jan. 1	22	+ 6	7.12	+ 43	36	7.584	95.28
Jan. 3-8	23	+ 7	7.09	+ 50	49	7.579	94.93
Jan. 10-15	24	+ 8	7.43	+ 59	64	7.573	99.54
Jan. 17-22	25	+ 9	7.54	+ 68	81	7.567	101.09
Jan. 24-29	26	+10	7.57	+ 76	100	7.562	101.55
Jan. 31-Feb. 4	27	+11	7.56	+ 83	121	7.556	101.48
Feb. 6-11	28	+12	7.71	+ 92	144	7.551	103.61
Feb. 13-18	29	+13	7.94	+103	169	7.545	106.76
Feb. 20-25	30	+14	8.27	+116	196	7.539	111.30
Feb. 27-Mar. 4	31	+15	8.29	+124	225	7.534	111.62
		-	233	- 14	2,480		

a = 7.618 b = -.0056

1/ Cottonseed prices, weighted weekly average from schedules

Table 6. Straight Line Trend of Weekly Average Cottonseed Meal Prices, August 2, 1937 to March 4, 1938 by Least Squares Method

	Number	x	y 1/	xy	x^2	Normal Trend	Actual as Percent of Normal y ÷ n
Aug. 2-8	1	-15	12.98	195	225	10.902	119.08
Aug. 10-16	2	-14	12.47	176	196	10.844	115.04
Aug. 18-22	3	-13	11.92	155	169	10.786	110.47
Aug. 24-29	4	-12	11.92	143	144	10.728	111.09
Aug. 31-Sept. 4	5	-11	11.02	121	121	10.670	103.28
Sept. 6-11	6	-10	10.15	102	100	10.612	95.66
Sept. 13-18	7	- 9	9.24	83	81	10.544	87.58
Sept. 20-26	8	- 8	9.19	74	64	10.496	87.62
Sept. 27-Oct. 2	9	- 7	9.10	64	49	10.438	87.16
Oct. 4-9	10	- 6	9.04	54	36	10.380	87.09
Oct. 11-16	11	- 5	9.24	46	25	10.322	89.53
Oct. 18-23	12	- 4	9.65	39	16	10.264	94.05
Oct. 25-30	13	- 3	9.84	29	9	10.206	96.38
Nov. 1-6	14	- 2	9.91	20	4	10.148	97.64
Nov. 8-13	15	- 1	9.84	10	1	10.090	98.10
Nov. 15-20	16	0	9.84	0	0	10.032	98.10
Nov. 22-27	17	+ 1	9.91	10	1	9.974	99.40
Nov. 29-Dec. 4	18	+ 2	9.41	19	4	9.916	94.86
Dec. 6-11	19	+ 3	9.17	28	9	9.858	93.00
Dec. 13-18	20	+ 4	9.31	37	16	9.80	95.00
Dec. 20-25	21	+ 5	9.76	49	25	9.74	100.20
Dec. 27-Jan. 1	22	+ 6	9.82	59	36	9.68	101.45
Jan. 3-8	23	+ 7	9.79	69	49	9.63	101.66
Jan. 10-15	24	+ 8	10.26	82	64	9.57	107.21
Jan. 17-22	25	+ 9	10.28	93	81	9.51	108.10
Jan. 24-29	26	+10	9.93	99	100	9.45	105.08
Jan. 31-Feb. 4	27	+11	9.67	106	121	9.39	102.98
Feb. 6-11	28	+12	9.59	115	144	9.34	102.68
Feb. 13-19	29	+13	9.60	125	169	9.28	103.45
Feb. 20-25	30	+14	9.67	135	196	9.22	104.34
Feb. 27-Mar. 4	31	+15	9.41	141	225	9.16	102.73
			311	-144	2,480		

a = 9.74 b = 05806

1/ Cottonseed prices, weighted weekly average from schedules.

Table 7. Straight Line Trend of Composite Value of Cottonseed Meal and Oil, August 2, 1937 to March 4, 1938, by Least Squares Method

	Number	x	y 1/	xy	x^2	Normal Trend	Actual as Percent of Normal y ÷ n
Aug. 2-8	1	-15	45.05	-675	225	39.71	113.44
Aug. 10-16	2	-14	43.66	-611	196	39.64	110.14
Aug. 18-22	3	-13	42.93	-558	169	39.56	108.52
Aug. 24-29	4	-12	42.16	-506	144	39.48	106.79
Aug. 31-Sept. 4	5	-11	40.81	-449	121	39.40	103.58
Sept. 6-11	6	-10	39.11	-391	100	39.32	99.46
Sept. 13-18	7	- 9	37.47	-337	81	39.25	95.46
Sept. 20-25	8	- 8	36.77	-294	64	39.17	93.87
Sept. 27-Oct. 2	9	- 7	36.31	-254	49	39.09	92.89
Oct. 4-9	10	- 6	36.93	-222	36	39.02	94.64
Oct. 11-16	11	- 5	36.56	-183	25	38.94	93.89
Oct. 12-23	12	- 4	37.85	-151	16	38.86	97.40
Oct. 25-30	13	- 3	37.43	-112	9	38.78	96.52
Nov. 1-6	14	- 2	37.23	- 74	4	38.70	96.20
Nov. 8-13	15	- 1	36.82	- 37	1	38.62	95.34
Nov. 15-20	16	0	36.85	0	0	38.55	95.51
Nov. 22-27	17	+ 1	36.13	+ 36	1	38.47	93.92
Nov. 29-Dec. 4	18	+ 2	36.39	+ 73	4	38.39	94.79
Dec. 6-11	19	+ 3	36.45	+109	9	38.32	95.12
Dec. 13-18	20	+ 4	36.85	+147	16	38.24	96.36
Dec. 20-25	21	+ 5	36.97	+185	25	38.16	96.88
Dec. 27-Jan. 1	22	+ 6	36.88	+221	36	38.08	96.85
Jan. 3-8	23	+ 7	36.73	+251	49	38.00	96.66
Jan. 10-15	24	+ 8	38.49	+308	64	37.92	101.50
Jan. 17-22	25	+ 9	38.93	+350	81	37.84	102.88
Jan. 24-29	26	+10	38.69	+387	100	37.77	102.43
Jan. 31-Feb. 4	27	+11	38.39	+422	121	37.69	101.86
Feb. 6-11	28	+12	38.89	+467	144	37.62	103.38
Feb. 13-18	29	+13	39.77	+517	169	37.53	105.97
Feb. 20-25	30	+14	41.05	+575	196	37.46	109.58
Feb. 27-Mar. 4	31	+15	40.90	+613	225	37.38	109.42
			1,195.45	-193	2,480		

a = 38.55 b = -.0778

1/ Cottonseed prices, weighted weekly average from schedules.

OIL MILLING IN MEMPHIS IN 1881

Henry J. Parrish, Manager of the Gayoso Oil Mill and a Past President of the Interstate Association Tells of Conditions When He Entered the Business Forty-Six Years Ago

Memphis, April 11, 1927

Editor Cotton Oil Press:

Dear Mr. Geldert: As requested by you, I give you some information regarding crushing cottonseed when I first started in the business in 1881.

In 1880 there were five oil mills in Memphis. In the latter part of that year the old Southern Cotton Oil Company, right north of the county jail, was burned, leaving four mills: the City Oil Works, the Hope Oil Mill, the Panola Oil Works, and the Memphis Oil Company. In the early part of 1881, there were three mills built here in Memphis--the Gayoso, the DeSoto and the Valley, making seven mills in all. In the season of 1881 and 1882, there were 48,000 tons of seed crushed in Memphis, about one-third by wagon, about one-third by railroad and one-third by river, costing a fraction over $12.00 per ton delivered.

There was no standard of railroads, some having wider roads than others, and of course there was no transfer between the railroads. The maximum loading on the old Mississippi & Tennessee road was 16,000 pounds for carload; on the balance 24,000 pounds. All seed had to be hauled from the freight depots to the mills. There were no track scales and no tank cars. All oil had to be barreled. The principal broker at that time was S. Katzenberger Sons who bought oil on commission for John V. Lewis & Son, Cincinnati, Ohio, and sold the meal to the eastern states. There was practically no sale for hulls and all the hulls were burned for fuel and if any surplus, they were thrown away.

Everything was very crude. There was only one reel to separate the bolls and sand from the seed and one reel to separate the hulls from the meats. There was generally left from 4 per cent to 5 per cent meat in the hulls and the mill that left 8½ to 9 per cent of oil in the cake was doing food word at that time. Yet with all this, the mills managed to get about 39 gallons per ton of seed. The meal was ground on an old burr corn mill which was dressed every Sunday and ground about 500 sacks daily which was coarse and there was no such thing as selling meal on ammonia basis in those days. If it was bright and partially free from hulls, it was a good delivery.

Instead of having a cake breaker like the present day, we had cylinder knives on top of the old burr mill which cut the cake up in large pieces before it was ground. The linters with long condensers were about five times longer than the present condenser. The lint was rolled over the reel and fell on the floor. I believe our mill was the first one to roll up the lint on the condenser. Our engineer took two cotton ties and a broom handle and attached it to one of the condensers and it rolled up the lint. Mr. Mann of the Carver Cotton Gin Company happened to see it and made quite an impression and adopted it and from that time on the lint was rolled up in large rolls on the condensing reel.

Yet with all these crude methods, as everything was so much cheaper than at the present time, including barrels, we could manage to manufacture a ton of seed a great deal cheaper than can be done at the present time.

About 1884 N. K. Fairbanks Company shipped out the first tanks for crude oil. The railroads had changed their rails so they could switch

to each road's track scales. Conveyors were put in the mill to convey the seed, costing a good deal less to manufacture. Speaking of Fairbanks sending the tanks, they did not want anyone to know that they were using cottonseed in their lard and therefore the tanks were branded—"Garden City Dairy Company of Chicago." Soon after this, they began to make oleomargarine and the business prospered until the Government put ten cents a pound on colored oleomargarine. This caused a curtailment in the use of oil and lowered the price when there was a great loss in the business for several years.

Different mills used different press room machinery. In our mill we used the Callahan equipment. The press was composed of six large boxes, weighing about 1,000 pounds each, made of cast iron—six boxes to a press. They had a capacity of about five tons a press a day. The heaters were about 48 inches in diameter, cast iron, emptying into a long trough after the meal was cooked. A stand with 6 holes revolving with hooks attached to the bottom to which six sacks were attached made out of press cloth, and the meal from the trough was scooped in these sacks. They were taken off and put into large hair mats and put into the presses. The pressure on these presses was about 2,500 pounds to the square inch, yet at that time a good many boxes were broken.

The cake made from the presses weighed about 8 pounds. The average yield of oil was from 38 to 39 gallons. The average meal per ton was about 760 pounds and the lint from ton of seed was anywhere from 15 to 25 pounds. This lint was a very fair staple and brought anywhere from 6½ to 8 cents per pound, in fact, nearly as much as hill staple cotton. The ashes from the hulls were sold at approximately $20.00 per ton but there was seldom a mill ever made over a carload a season, and at that

time a mill that received 7,000 or 8,000 tons seed a season, had a very nice crush. Seed that were received from the river, the mills furnished the sacks and they were under their own brand, and no mill would take each other's sacks.

There was a great loss in these sacks as the mills in those days bought a double selvage gunny bag that cost about 27 cents each and as the sacks were furnished free, the loss was about 35 per cent a season. The farmers used them for whatever needs they might require, making back bands, saddle blankets, chicken coops and some of the darkies used them for coats.

I think this is about a fair representation of what the mills were doing in the early 80's.

Yours very truly,

H. J. PARRISH

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