

THE PEANUT INDUSTRY IN OKLAHOMA

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PREFACE

From early boyhood the author has watched the Oklahoma peanut industry grow from a half acre garden crop to its present status as a major agricultural crop of the state.

During the early twenties, a neighbor in Creek County, Oklahoma, was the ideal farmer of every young boy in the community. Mr. Rogers, as we knew him, grew two acres of peanuts and usually carried a pocketful of these tasty roasted nuts with him when visiting the neighbors. These he passed out freely to the youngsters in the community who thought he was an outstanding farmer because he produced more peanuts than anyone else in the neighborhood. A part of this two acres of peanuts was hand picked for roasting purposes and the rest of the nuts and vines was fed to the farm livestock. Peanut production increased very little in that area during the twenties and early thirties.

While checking and classifying field crops for the United States Agricultural Adjustment Administration in Creek County, during the late thirties, the author had the privilege of checking several acres of peanuts grown for the commercial market in that area. This work gave the writer an increasing interest in peanuts as an agricultural industry for Oklahoma.

Creek County lies near the northern limits of the commercially grown peanut area, but by the summer of 1942 the

author had classified more than a thousand acres of peanuts in that county for the Agricultural Adjustment Administration and had talked to many farmers concerning the growing and harvesting of peanuts.

By further study of the peanut, in relation to the soils and climate of Oklahoma, the writer is convinced that this crop has great possibilities for further development in this state, only if it is handled correctly.

The writer wishes to express his gratitude to Dr. Edward E. Keso, Professor of Geography, Oklahoma A. & M. College, under whose direction this study was made, for valuable suggestions in preparing this study; to George S. Corfield, Assistant Professor of Geography, Oklahoma A. & M. College, for suggestion of the subject and for valuable suggestions in preparing this study.

The author is greatly indebted to several individuals and corporations for furnishing information which was necessary for writing this thesis. Gratitude is expressed to the Southwestern Peanut Growers Association, Gorman, Texas, as well as the National Peanut Council, Inc., Birmingham, Alabama, for information furnished concerning the entire peanut industry.

For information concerning the peanut industry in Oklahoma gratitude is expressed to Wesley Chaffin, Acting Extension Agronomist of Oklahoma A. & M. College Extension Service; Ralph McMillen, Manager of the Bristow Peanut Company, Bristow, Oklahoma; John Haskins, Vice-President of

the Durant Peanut Company, Durant, Oklahoma; and the entire library staff of the Document Department at the Oklahoma A. & M. College Library. Numerous other persons have furnished valuable information, and have given constructive advice for which it is a pleasure to acknowledge.

Huber Self

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CHAPTER I

INTRODUCTION

Almost overnight, peanuts have become a flourishing industry of Oklahoma. Before 1940 the state grew only a relatively small acreage of peanuts. Most of this acreage was grown in a few counties in the southeast. Production jumped from less than 22 million pounds in 1939 to more than 54 million pounds of peanuts in 1940 and this increased to an all time high of more than 151 million pounds in 1942. Peanut acreage has declined little since 1942. At the same time production has become widespread over the state, until most of the counties, except those in the northern and northwestern area, now produce peanuts commercially.

The value of peanuts increased from less than 800,000 dollars in 1939 to more than 9 million dollars in 1942, and by 1946 peanuts gave Oklahoma farmers an industry estimated¹ at more than 10 million dollars annually.

This relatively new industry, born during recent war years, caused considerable speculation by many people concerning its endurance. The question is continually being raised concerning future prospects for peanuts in Oklahoma,

1.

Agriculture Statistics, U. S. Department of Agriculture, Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 1939-1946.

when scarce food and industrial items, for which peanuts have been substituted, return to the market in an amount large enough to supply the consumer demand.

It is not the purpose of the author to answer these questions here, although several predictions by various authors concerning the future of the industry have been cited.

The purpose of this study has been to show the development of the peanut industry and the changes which it has brought about in Oklahoma. It is also the purpose to show how this crop has benefited the farmer as well as industry in Oklahoma. At the same time it is intended to show the disadvantages which this crop presents and ways in which these disadvantages are to be overcome.

Written information concerning the peanut industry in Oklahoma is very limited. Only a part of the industry of this state has been written in detailed form. Other information desired, was scattered through many government bulletins and agriculture statistics. It was necessary to make personal interviews with people who were familiar with the peanut industry of the state and to write letters to various peanut agencies and corporations who were able to furnish valuable information relating to the peanut industry.

During the past several months, Bruce T. Robb, Research Agent for the United States Federal Reserve Bank at Kansas City, made many personal interviews with various bankers, soil conservation men, peanut buyers and shellers, county agents, and peanut farmers over the state. The results of

these personal interviews, together with valuable statistical data from the U. S. Department of Agriculture, were published in the fall of 1946, in a pamphlet entitled "The Future of the Peanut Industry in Oklahoma." Information in this pamphlet has been extremely valuable in preparing this study.

Chapter II, "History and Development of the Peanut Industry," attempts to give the origin and background of the peanut industry and necessarily includes the entire peanut producing area of the United States. This chapter also includes information concerning world production. Other chapters refer more to the peanut industry as it affects Oklahoma.

CHAPTER II

HISTORY AND DEVELOPMENT OF THE PEANUT INDUSTRY

I. Origin of the Peanut

The peanut (*Arachis hypogaea*), grown extensively in the tropical and more temperate regions of the world, is a native of tropical America. The fact that this familiar ground nut is not mentioned by the ancient Greek, Latin and Arab authors, caused various plant scientists to suspect its tropical American origin. Further research fails to show any record of the species among early Egyptian records. Early Chinese and Japanese literature does not mention the plant, although it has been grown extensively in these countries in recent years. Early records in the small islands of the Pacific do not mention the plant.¹

The peanut plant is mentioned in some of the earliest writings on Peru and Brazil and the seeds of *Arachis* have been found in the Peruvian tombs of Ancon. Although *Arachis hypogaea* was the only species of this singular genus known, six other species, all Brazilian were discovered before 1890. Plant scientists no longer doubt the fact that the peanut is indigenous to tropical America.²

In 1936 William Archer, a plant explorer of the United States Department of Agriculture, engaged in a search for wild types of peanuts, found wild forms growing extensively in the

¹. Alphonse De Condolle, Origin of Cultivated Plants
New York: D. Appleton and Company, 1890, pp. 411-415.

². Ibid., p. 415.

southern part of Paraguay, throughout Uruguay, in the northeast part of Argentina, and in southern Brazil. Dr. Archer found several strains closely related to our cultivated peanuts grown by the Indians of southern Brazil and Paraguay, including about fifteen species of wild peanuts aside from our cultivated species, *Arachis hypogaea*.³

It is believed that the first slaveships carried the peanut from Brazil to Guinea, and the Portuguese from Brazil into the islands to the south of Asia, at the end of the fifteenth century.⁴ Slave traders brought peanuts from Africa to North America in Colonial days. These slave traders noticed that the slaves were in better physical condition upon arrival when a plentiful supply of raw peanuts was used on the trip.⁵ They were a food that could be stored in the holds of the vessel without loss through spoilage.

II. Growth and Development of the Peanut Industry in the United States

The English settlers in Virginia planted peanuts in the territory around the James River during the seventeenth century.⁶ Prior to the Civil War, the only commercial use made of peanuts was that of feeding hogs. It is said that Smithfield hams, for which Virginia is famous, were made from peanut-fed

³. Harold J. Clay, Marketing Peanuts and Peanut Products. Miscellaneous Publications No. 416, Agriculture Marketing Service, U.S. Department of Agriculture, Washington, D.C., Sept., 1941, p. 2.

⁴. Condolle, Op. Cit., pp. 411-415.

⁵. Paul W. Chapman, (Dean, Georgia College of Agriculture), "Will The Boom In Peanuts Last?" Southwestern Peanut Growers News, Volume V, No. 4, May, 1945, p. 1.

⁶. F. R. Edwards and Z. A. Massey, Peanut Meal in Live-stock Production, Georgia Experiment Station of the University System of Georgia, Bulletin No. 216, June, 1941.

7
pork. During the Civil War almost every army in the field occupied at one time or another, that portion of Virginia in which peanuts were grown. When armies disbanded the soldiers carried a knowledge and an appreciation of peanuts to all parts of the country.⁸

Upon returning home these soldiers asked for peanuts at their local stores. The demand led to the establishment of the old and important commercial peanut industry in the Virginia-Carolina district.⁹ Between 1865 and 1870, the production of peanuts increased annually from 200 to 300 percent.¹⁰ By 1868, 300,000 bushels were produced in Virginia¹¹ and eleven years later, in 1879, commercial estimates placed the yield of the country at 1,725,000 bushels.¹²

Some authorities believe that only the large podded peanuts were brought to this country by early slaves. The Virginia type and the African, or Wilmington type, probably came from different sections of Africa. The Spanish peanut, it is quite possible, may have been introduced into Vir-

7. Chapman, Op. Cit., p. 1.

8. "Peanuts." Bureau of Census, 1902, In the 12th Census of the U. S., 1900. Volume 6, Part II: Washington,

9. Chapman, Op. Cit., p. 1.

10. "Peanuts," Op. Cit., pp. 514-515.

11. "Cultivation of the Peanut." U. S. Department of Agriculture, 1869. Report of the Commissioner of Agriculture, 1868. pp. 220-224.

12. "Peanuts (*Arachis Hypogoea*)." U. S. Department of Agriculture, 1880, Report of the Commissioner of Agriculture, 1879, p. 143.

ginia from Malaga, Spain in 1871.¹³

Public acceptance of peanuts increased considerably when P. T. Barnum, the great circus pioneer, introduced peanuts to audiences at the circus throughout the country,¹⁴ toward the end of the last century. This increased demand for the large podded peanut greatly stimulated their production, but hand work in cleaning and preparing them for market proved impractical on a large scale.

The commercial development of the peanut began with the erection of modern cleaning plants. A factory for cleaning peanuts was installed in 1876 in New York City, the leading market for peanuts at that time. Eastern Virginia was found to be the most logical place for a peanut plant to be located, and one that had a capacity of 1,800 bushels of peanuts a day was established in Norfolk in the same year. A second factory was established in Norfolk in 1878, and a much larger one in Smithfield, Virginia in 1880. Other plants followed in Virginia, North Carolina and other states, until by 1890 plants were operating in Cincinnati, Nashville, and St. Louis. Before 1905 the large-podded peanut area possessed many factories which had improved machinery for cleaning and shelling peanuts.

13.

Clay, Op. Cit., p. 2.

14.

John F. Marsh, "The Increasing Importance of the Peanut." Bureau of Agriculture Economics, The Agriculture Situation, Volume 29, No. 7, Washington, D. C., July, 1945, pp. 18-22.

The most rapid growth came in the cotton belt, notably in Alabama, Georgia, Florida, and Texas. The swift advance of the boll weevil from Texas eastward, with its ruinous effect on the cotton yield in many large areas, caused farmers to turn to other crops.¹⁵ These early peanuts were of the runner variety and were used mainly for hogging-off.)

Stimulated by the demand for edible vegetable oils during World War I peanut growing, as a commercial enterprise, started about 1916 in the southern area. For oil production the Spanish variety was found more profitable and culture of this variety increased rapidly. Due to the lack of shelling plants within the area the crop was crushed in the shell, producing a low yield of poor quality oil, or else the peanuts were shipped to shelling plants in the old peanut belt in Virginia and North Carolina. With the establishment of the shelling plants and increasing demand for Spanish peanuts in the confectionery trade, the industry developed rapidly.¹⁶ The peanut promised a market either directly at shelling or crushing mills or indirectly at pork-packing plants. A wave of peanut growing, therefore, swept over the southern states.

15.

Clay, Op. Cit., pp. 2-3.

16.

B. B. Higgins, K. T. Halley, T. A. Pickett, and C. D. Wheeler, Peanut Breeding and Characteristics of Some New Strains, Bulletin No. 213, Georgia Experiment Station, University System of Georgia, June, 1941, p. 3.

Men familiar with the shelling and cleaning operations in the Virginia plants erected the first modern peanut plant in the Southwest at Terrell, Texas in 1907, although the year previous a crude plant had been erected at Paris, Texas. Numerous other plants were rapidly established in the Texas area for shelling or crushing peanuts. In 1910 a peanut factory was established at Shreveport, Louisiana. Carlots of peanuts were crushed at Charleston, South Carolina, in 1914, following experimental crushing in 1912. By 1917 peanuts were shelled or crushed at Edison, Fitzgerald, Fort Gains, Quitman, and Bainbridge, Georgia; Enterprise, and Bundige, Alabama; and perhaps at other southern points. Scores of new shelling and crushing plants sprang up. Many of the older cottonseed-oil mills added the equipment necessary for shelling or crushing peanuts.¹⁷

During the late thirties Georgia produced about one-third of the harvested crop of the country and more than half the unharvested, or hogged-off crop. Most of the harvested crop is of the Spanish variety, which appears to be well adapted to the comparatively heavy soils of the Southwestern Coastal Plain Counties and the bulk of the crop is produced in this region at the present time.¹⁸

For a few years, during the war, the peanut boom made money for the farmer. After the Armistice in November, 1918, however, the combination of decreased demand for

17. Clay, Op. Cit., p. 3.

18. Higgins, Op. Cit., p. 3.

vegetable oils and heavy importations of oriental peanuts lessened, for a time, the interest of southern farmers in this crop. Yet, the acreage in the cotton belt, after fluctuating over a period of years, has increased sharply since 1929. The menace of the boll weevil to the prosperity of cotton growers has caused southern farmers to expand their acreage of peanuts as a money crop in the program of crop diversification in the southern states. Moreover, mills crushing cottonseed welcome the peanut to their communities, as it furnishes employment for their plants after¹⁹ the cottonseed crushing is over.

The outstanding gain of the peanut is shown by the fact that peanut sales increased during the depression and crop reduction years between 1920 and 1940. Peanuts and soybeans were the only two crops which had increased in value while the total farm income was decreasing.²⁰

Between 1909 and 1916 the production of peanuts in the United States nearly doubled. The crop of the war years, 1917 and 1918, reached almost a billion pounds. In the decade of the twenties production averaged nearly three-fourths of a billion pounds, while in the decade of the thirties it exceeded a billion even though prices averaged nearly 40 percent below those of the preceding decade. A

19.

Clay, Op. Cit., p. 3.

20.

Chapman, Op. Cit., p. 1.

steady to rapid growth of production continued in this
²¹country and by 1940 the peanut ranked second to cotton
²²as a southern cash crop.

The present status of the peanut results from World War II. Prior to 1941 the United States imported large quantities of vegetable oils annually. These shipments were stopped with the beginning of the war, and supplies from foreign sources could no longer be obtained, in spite of the fact that the demand for such oils at this time greatly increased. World War II curtailed the imports of coconut oil from the Philippines, palm oil from the Dutch East Indies, tung oil from China, and olive oil from the Mediterranean area. In response to the urgent war needs, American farmers nearly doubled the production of peanuts. The largest relative gain came in Oklahoma, which now stands next to Virginia in the production of this farm crop, (See Figure 1).

In the four years, 1942-1945 inclusive, Oklahoma's production of peanuts averaged about six times the usual prewar crop. For the whole country, production during the war increased only 90 percent. In large peanut producing states like Georgia and Alabama the increase reached little more than 50 percent, while in North Carolina and Virginia

21.

Bruce T. Robb, The Outlook for Peanut Production in Oklahoma, Federal Reserve Bank of Kansas City, Research Department, November, 1946, p. 12.

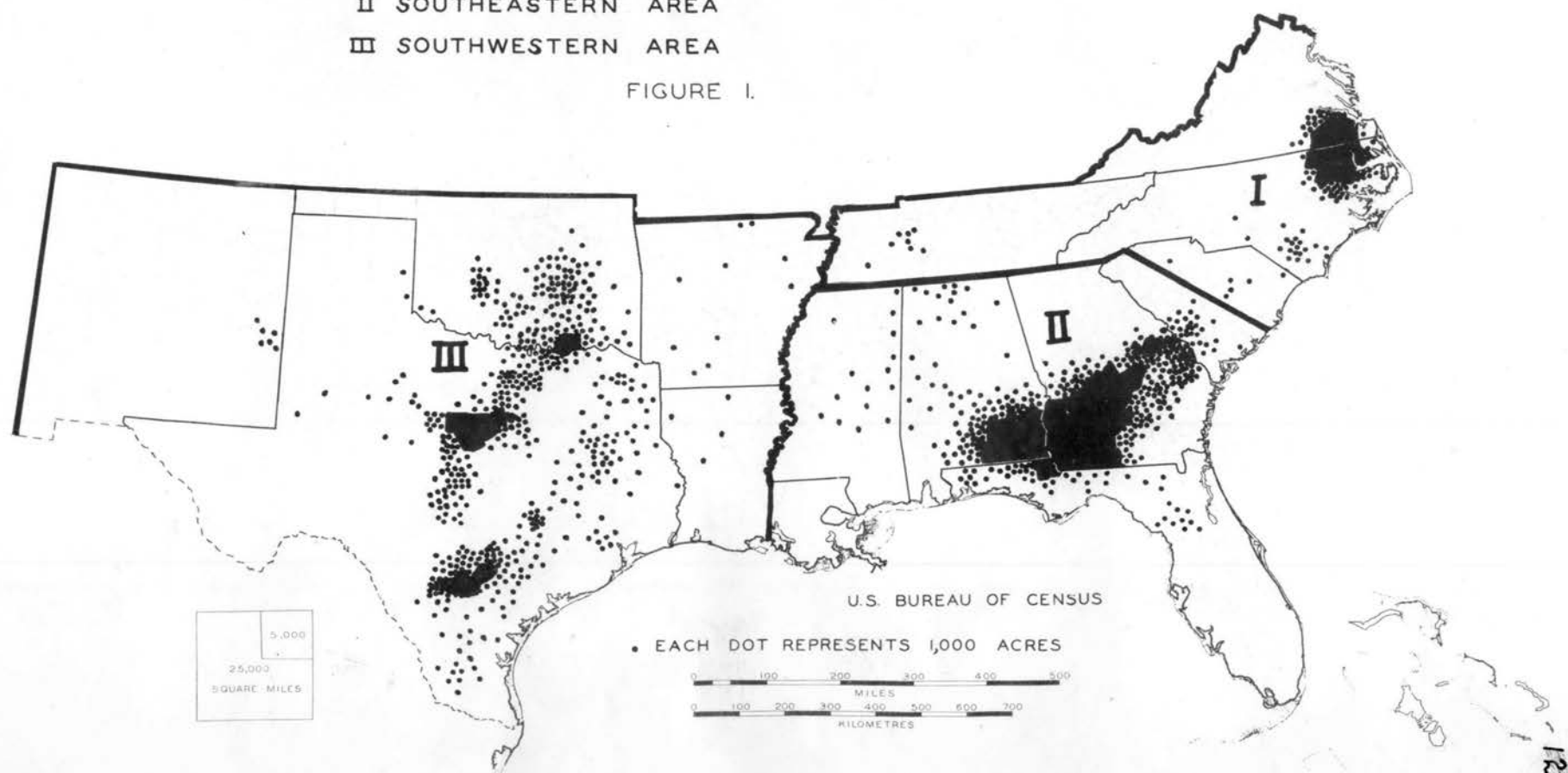
22.

Rackham Holt, George Washington Carver An American Biography, Doubleday, Doran and Company, Garden City, N. Y., 1943, p. 318.

PEANUTS HARVESTED FOR NUTS
BY STATES
1945

- I VIRGINIA-CAROLINA AREA
II SOUTHEASTERN AREA
III SOUTHWESTERN AREA

FIGURE I.



the increase was only normal. Only in Texas did production increase anything like that of Oklahoma; the Texas war crops about trebled those of prewar.²³ This increase is illustrated by the table on page 14 and 15.

In 1945, for the first time, peanuts became the number one cash crop of Georgia. This fact highlights the phenomenal expansion of an industry that has undergone a five-fold increase in cash value during the war, and now brings²⁴ an estimated \$200,000,000 annually to southern farmers.

The increase in peanut production was stimulated to produce peanuts for oil, but the fact remains that during the war years consumer demand for edible peanuts and peanut products increased to such an extent that the amount of peanuts crushed for oil did not increase after 1941, although the production of peanuts has increased substantially. In 1940-41, under the stimulus of the government-sponsored diversion program, 35 percent of the crop was crushed as compared to about eight percent of the 1939 crop. In 1941 the peanut crop produced about 171,000,000 pounds of peanut oil and 260,000,000 pounds of peanut meal. Of this production 75 to 90 percent of the oil was consumed in the manufacture of shortening and oleomargarine and all

23.

Robb, Op. Cit., p. 1.

24.

C. L. Wrenshall, Industrial Uses For Peanuts and Peanut Products, Southern Research Institute, Birmingham, Alabama, Chemurgie Reprint Series No. 45, May 15, 1946, p. 1.

TABLE I

The following table shows the production of peanuts picked and threshed and the price of peanuts since 1909, as reported by the United States Department of Agriculture Statistics, 1905-1946. In addition to those picked and threshed, the amount raised for other purposes -- mostly to be "hogged off" -- averaged about half as much in this period.

	PRODUCTION							Season Average Price U. S. (Cents per pound)
	U. S.	Georgia	Texas	Alabama	N. C.	Virginia	Oklahoma	
	Thousand Pounds							
1909	354,605	31,500	26,400	39,000	121,500	98,600	450	4.1
1910	383,875	26,000	26,000	35,000	136,400	124,300	550	4.0
1911	365,800	32,000	31,500	37,500	119,350	107,900	575	4.2
1912	361,625	33,750	36,000	40,700	122,250	91,000	675	4.4
1913	383,000	40,000	32,625	39,000	126,000	110,400	525	4.5
1914	421,075	53,625	34,875	52,500	129,425	112,700	1,350	4.2
1915	480,680	56,000	44,000	77,000	140,180	115,600	2,250	4.1
1916	665,950	79,750	87,000	129,375	177,450	139,500	4,725	4.8
1917	988,705	195,000	156,000	271,875	145,350	135,000	7,000	7.0
1918	945,975	244,125	94,500	240,000	139,400	147,000	5,700	6.5
1919	688,270	115,575	51,750	165,000	141,624	140,714	5,520	9.4
1920	695,842	162,720	48,600	174,900	127,386	110,390	5,250	4.7
1921	678,200	145,860	49,755	144,650	142,410	122,400	6,875	3.8
1922	523,345	109,800	37,520	95,000	130,500	85,800	5,775	5.4

	U. S.	Georgia	Texas	Alabama	N. C.	Virginia	Oklahoma	Price
1923	568,150	107,100	32,760	70,030	176,000	122,760	4,950	6.5
1924	712,815	240,000	24,705	111,100	180,500	86,400	3,250	5.8
1925	721,660	184,620	26,235	85,250	218,500	144,900	3,900	4.3
1926	662,190	140,875	36,875	68,370	200,850	152,640	6,400	5.0
1927	844,220	227,200	63,600	108,750	220,500	145,800	13,300	5.2
1928	843,505	194,500	81,270	105,600	210,000	165,240	24,050	4.9
1929	898,197	243,750	59,640	117,150	224,400	157,590	25,000	3.7
1930	697,350	209,475	49,900	92,575	178,350	99,360	10,200	3.5
1931	1,055,815	311,850	66,500	140,560	275,000	172,840	13,600	1.6
1932	941,195	262,150	76,650	124,550	229,500	146,590	15,950	1.5
1933	819,620	253,700	81,000	92,950	180,500	111,150	20,625	2.8
1934	1,014,385	292,125	57,950	165,750	252,280	143,500	16,500	3.3
1935	1,152,795	338,575	98,000	203,000	252,000	149,100	27,000	3.1
1936	1,260,020	431,250	90,300	237,000	258,000	148,320	10,260	3.7
1937	1,232,755	381,790	92,400	186,300	307,400	177,660	11,875	3.3
1938	1,288,740	454,740	118,350	220,875	244,110	136,300	20,140	3.3
1939	1,211,710	368,500	133,630	142,500	291,550	179,080	21,995	3.4
1940	1,749,705	581,625	184,800	227,850	366,800	215,670	54,000	3.3
1941	1,476,845	487,500	156,040	252,000	265,640	169,510	46,200	4.7
1942	2,211,535	627,690	430,080	335,400	332,100	175,950	151,050	6.0
1943	2,184,760	765,380	298,980	416,150	301,920	174,720	61,875	7.1
1944	2,110,775	683,620	325,600	327,600	343,910	191,180	111,180	8.0
1945	2,061,570	709,920	330,960	340,900	296,400	151,340	108,000	8.0
1946*	2,061,050	714,150	382,000	229,950	310,800	193,200	133,920	8.6

*November 1 estimate.

of the meal was used in livestock feeds.²⁵ So great was the demand for peanuts for food for the armed services and for confections, that most of the farmers' stock peanuts sold under the government sponsored program for oil crushing in 1944, were converted to food production. Continued demand for peanuts used as food has resulted in keeping the amount of oil produced below that of 1941.²⁶ Without government subsidy, peanuts for food bring a greater price than peanuts sold for oil.

Of the edible peanut products, about 40 percent is consumed as peanut butter. About 30 percent is used as salted peanuts and 21 percent goes into confections. The rest are consumed in bakery goods and by miscellaneous users.²⁷

III. World Production

Peanuts are a world commodity, but we are about the only people in the world who have learned to eat peanuts as a delicious food item. Foreign peanuts have long been produced for oil. Located in these peanut producing countries are tremendous oil mills for the extraction and refining of

25.

K. S. Markley, "Research on Peanuts and Peanut Products at the Southern Regional Research Laboratory." National Peanut Council Annual Report, 1943-44, pp. 51-61.

26.

Walter A. Richards, (President, National Peanut Council). "The Outlook of the Peanut Industry." Southwestern Peanut Growers News, Volume V, No. 4, May, 1945, pp.1-2.

27.

Marsh, Op. Cit., pp. 18-22.

peanut oil for shipment all over the world in normal times.

India is today the world's greatest producer of peanuts. For years India has suffered great famines in spite of the fact that its potential ability to produce food is tremendous. India has not learned the value of peanuts. The India crop for 1946 was somewhat larger than the 1935-39 average. The yield for that year is estimated at 3,360,000 short tons.

China is the world's second largest peanut producer. China's 1946 peanut production is estimated at 3.1 million tons, the largest crop recorded since the early 1930's.

French West Africa is the world's third producer of peanuts and the greatest exporter of peanut oils. The latest information available indicates that country produced only 358,000 tons of peanuts in 1936, or a drop of 40 percent below last year's crop and almost 60 percent below the 1935-39 average. A labor shortage caused by lack of incentive goods, in turn resulted in a small planted acreage. The large carry-over and late marketing of the 1945 crop, as well as unfavorable weather conditions, were additional factors influencing the 1946 output.

The United States ranks fourth in the production of peanuts in normal years, and a poor fourth at that, but we have done one thing with peanuts that the balance of the

28.

"World Peanut Production Nearly Average." Foreign Crops and Markets, Vol. 53, No. 24, Issued by the Office of Foreign Agriculture Relations. U. S. Department of Agriculture, Washington, D. C., December 9, 1946. pp. 1-5.

world has never been able to do. We have learned to utilize them as food to such a remarkable degree that they have ranked as one of the number one agricultural food crops in the war effort, and today almost every man, woman and child in this nation eats peanut products in some form or in some combination with other food. A unique selling job has been done in this country. We have lifted the peanut from the status of a "cheap labor" oil seed to a high priced food item which will pay American farmers a good return for their labor.²⁹ Peanut butter is almost unknown in Europe and most countries of the world, though small lend-lease shipments may have whetted the appetite of many abroad. Its popularity here, however, indicates probable revolutionary developments for the industry in the years ahead if its uses become as well known in foreign countries.³⁰

The United States reports a peanut crop for picking and threshing of 1,030,500 tons in 1946. This is only 300 tons less than the 1945 crop. This is the fifth consecutive year in which production has exceeded a million tons.³¹

The world peanut production for 1946 is tentatively estimated at approximately 9.5 million tons, a decrease of only

29.

Roy E. Parrish, "Peanuts After the War." Annual Report National Peanut Council Inc., 1943-1944, p. 22.

30.

Marsh, Op. Cit., XXIX, pp. 18-22.

31.

Foreign Crops and Markets, Op. Cit., Volume 53, No. 24, p. 3.

3 percent from 9.8 million tons output of 1945, and a slight decline from the 1935-39 average. In view of the present short supply of fats and oils, it is not likely that a further decline in world production will occur in the immediate future.³²

To help relieve the world shortage of fats and oils, lessen the nation's food bill, and raise the standard of living of its subjects in African colonies, the British Government has devised a plan whereby they will establish mechanized farm units for the raising of peanuts on barren and largely empty land in Kenya, Northern Rhodesia and Tanganyika. The maximum cash requirement for the development and operation of the scheme is to be between 25 and 26 million pounds, to be fully amortized within the next 25 years.

Preparation of the land was begun in the fall of 1946. Over three and one-fourth million acres are to be developed. There will be 107 mechanized units of 3,000 acres, each unit having the necessary living amenities. A development program extending over five years has been worked out. Labor demands are relatively small, due to the high degree of mechanization proposed. When cultivation is in full swing there will be permanent employment for more than 700 Europeans and 32,000 Africans.³³

32.

Ibid., p. 5.

33.

Beverley Owen, "Britain's Bid For New Empire" Liberty, June 12, 1947, pp. 26-27.

IV. George Washington Carver

< No one person has done so much toward the advancement of the peanut as the great negro scientist, Dr. George Washington Carver, often spoken of as the "plant wizard" of Tuskegee Institute.>

Carver was born of slave parents near Diamond Grove, Missouri, about 1864. In infancy he lost his father and was stolen and carried into Arkansas with his mother who was never heard of again. Carver was bought from his captors for a race horse valued at three hundred dollars and returned to his former home in Missouri. Carver worked his way through high school. Later he won a B. S. and M. S. Degree and a post as laboratory botanist, at Iowa State College. In 1896 Carver went to work for Booker T. Washington, Founder of Tuskegee Institute, Alabama. < In over forty years of productive work at Tuskegee, Dr. Carver has produced more than 300 by-products of the peanut.

Many of Carver's experiments have not proven of commercial value and are therefore impractical. Many, on the other hand, are products of major importance. They range from butter, cheese, pickles, and candies to pharmaceutical preparations such as face powder, printers ink, shaving lotion, shampoo, dyes, cooking fats, and confections.

Dr. Carver has endeavored to find a substitute which would raise the living standards of the tenant cotton farmer of the south. To many southern farmers he has proven that the peanut has raised the living standards of southern

people above the standards which they endured by growing
 34
 cotton.

V. The National Peanut Council Inc.

The National Peanut Council was formed in 1940 by a group of representatives of the peanut industry, including growers, warehousemen, shellers, crushers, confectioners, peanut butter manufacturers, salters, brokers, and related industries who felt there was a vital need for a unified organization to advance the peanut industry. Through this organization peanuts are a well sponsored industry. This organization is spending some 200,000 dollars annually on their program consisting of research, education, publicity, advertising, and conference. The main purpose of the council is to hold the wartime gains made by the peanut industry. 35 Wars have always increased peanut sales permanently. The chief purpose for the council, therefore, is to create a demand for peanuts and peanut products that will dispose of twice the 1935 output and do it at a profit. Both edible 36 and industrial channels are being completely explored.

The National Peanut Council does not undertake a comprehensive program of research. Rather, the role of the

34.

Holt, Op. Cit., pp. 1-235.

35.

Paul W. Chapman, (Dean, Georgia College of Agriculture). "Will The Boom in Peanuts Last." Country Gentleman, March, 1945, p. 22.

36.

James E. Wood, Annual Report National Peanut Council, Inc., Atlanta, Georgia, 1945-1946, p. 3.

council is conceived to be that of a planning and coordinating agency, giving voice to research needs of the industry, pointing out instances of duplication or problems that are receiving insufficient attention, and striving to achieve equitable distribution of effort in the interests of all segments of the industry. The council cooperates fully with the United States Department of Agriculture and several of the State Experiment Stations, concerning various research problems. The council continues to bring before the research specialists, problems of the peanut industry that need to be solved.³⁷

The National Peanut Council has pointed out the fact that less research is devoted to peanuts than any other principal American crop, that the average yield per acre of peanuts has not increased in many years while other crops have made steady gains; the methods of cultivating and harvesting peanuts are primitive as compared with the mechanization used in handling other crops; that, because so much of the equipment used all along the line from grower to end user has been adapted from other industries it is inadequate and inefficient in processing peanuts.³⁸

37.

Lewis C. Wrenshell, A Survey of the Research Status of the Peanut Industry, A report to the National Peanut Council, Inc., Southern Research Institute, Birmingham, Alabama, February 1, 1946, pp. 4-5.

38.

Walter A. Richards, The Peanut Industry at the Crossroads, The National Peanut Council, Inc., Atlanta, Georgia, 1946, p. 2.

The peanut industry has come a long way from its early beginning. Many astonishing improvements will no doubt be developed in the future history of the industry. As has been pointed out, there is room for much improvement within the industry and many of these improvements are now being perfected in various research laboratories over the nation.

CHAPTER III

GROWING AND HARVESTING PEANUTS IN OKLAHOMA

Instead of being a nut, the peanut is really a legume like a pea or bean. Its fruit pod, however, matures beneath the surface of the soil. The stem of the peanut grows to a length of one to three feet and has pinnate leaves similar to the clover but with four leaflets. Before the leaves develop, yellow sterile flowers appear on the stem and soon die. Later the plant bears smaller flowers which are nearly hidden by the foliage. After fertilization, the true peduncle develops and grows to reach the soil and push the "peg" three or four inches below the surface where the pods are formed. The pods are about one-half to three inches in length and are roughly cylindrical. The shell of the pod comprises from 20 to 30 percent of the whole nut and may be easily separated from the kernels. The kernels themselves are enveloped by a thin red-brown, purple, or white skin¹ called the testa.

1. John D. Guthrie, Carroll L. Hoffpauir, and others, Survey of the Chemical Composition of Cotton Fibers, Cottonseed, Peanuts, and Sweet Potatoes, A Literature Review, Southern Regional Research Laboratory, New Orleans, Louisiana, U. S. Department of Agriculture, Agriculture Research Administration, Bureau of Agriculture and Industrial Chemistry, 1944, p. 39.

I. Varieties of Peanuts

(The White Spanish and Improved Spanish varieties are used for marketing purposes in Oklahoma. These varieties produce the highest yield, have an excellent flavor, and high oil content. The Improved Spanish has a larger pod than the White Spanish of which it is a strain, and has been planted in this area only recently. Commercially it is rarely sold separate from the small Spanish variety.² The Tennessee Red variety is recommended for livestock feed and other home uses.³)

II. Seasonal Requirements

Peanuts require a season of 100 to 140 days without frost; moderate rainfall during the growing period; an abundance of sunshine, and a relatively high temperature.⁴ If planted in the early part of the season it is possible to mature a crop of peanuts in almost any section of Oklahoma.⁵)

2.

Harold J. Clay, Marketing Peanuts and Peanut Products. Miscellaneous Publication No. 416, U. S. Department of Agriculture, Washington, D. C., September, 1941, pp. 5-6.

3.

Wesley Chaffin, Peanuts In Oklahoma, Circular No. 410, Oklahoma A. & M. College Cooperating with U. S. Department of Agriculture, Extension Service, 1945, p. 6.

4.

W. R. Beattie and J. H. Beattie, Peanut Growing. Farmers' Bulletin No. 1656, U. S. Department of Agriculture Washington, D. C., Issued February, 1931, Revised March, 1943, p. 4.

5.

M. A. Beeson, Spanish Peanuts, Circular No. 17, Oklahoma A. & M. College, In Cooperation with the U. S. Department of Agriculture, Extension Division, Stillwater, Oklahoma, February, 1918.

III. Soils

(Sandy loam soils are best adapted for commercial peanut production.) The soil should be loose and friable and should be well drained. Fine-textured soil and poorly drained soils are not suitable for growing peanuts.⁶ Soils which form a hard crust are not suitable because the fruit stems⁷ or "pegs" are prevented from entering the soil.

IV. Fertilizers and Lime for Peanuts

Failure of peanuts to respond to the use of fertilizers as commonly practiced is undoubtedly a limiting factor in raising the average peanut yield. Not only does the peanut fail to respond markedly to direct applications of commercial fertilizers and amendments, but such responses as are observed are not consistent, varying widely from field to field even on the same soil type. This behavior is in marked contrast to that of other crops such as corn and cotton for which the yield increase to be obtained for a given application of fertilizer can be predicted with almost

6. Chaffin, Op. Cit., p. 3.

7. E. R. Collins, Producing Peanuts For Oil. War Series Bulletin No. 17, North Carolina State College of Agriculture and Engineering of the University of North Carolina. U. S. Department of Agriculture cooperating, North Carolina Extension Service, State College Station, Raleigh, North Carolina February, 1943, p. 3.

8

mathematical certainty. Yields depend, to a great extent, on the amount and distribution of rainfall during July, August, and September. When there is an abundance of moisture in the soil, peanuts will make good growth on soils which are relatively low in available plant nutrients. If moisture is the first limiting factor in plant development, yields may not be increased by fertilizer treatments. Peanuts following well fertilized crops may be expected to give good yields without fertilizer. The plan for such a system is the application of heavier fertilizer applied to the more responsive crops of the rotation, allowing peanuts to take advantage of the plant food which was not used by the preceding crops.

When peanuts are grown as a cash crop and the vines are removed from the soil, 200 pounds per acre of a 2-12-6 fertilizer is recommended by the Oklahoma Agricultural Experiment Station. An application of 150 to 200 pounds per acre of rock or superphosphate will increase the yield of peanuts on soils which are low in available phosphorus but which are not deficient in potassium.⁹ Unless the fertilizer is well mixed with the soil, it should be placed in such a way that it does not come in direct contact with the seed.

8.

C. Lewis Wrenshall. A Survey of the Research Status of the Peanut Industry. A Report to National Peanut Council Inc., Southern Research Institute, Birmingham, Alabama, February 1, 1946, p. 14.

9.

Chaffin, Op. Cit., pp. 3-4.

Results obtained from the use of lime on peanuts by various investigators indicate that the quality of the peanut is affected much more than the quantity. Peanuts grown on soil having sufficient lime are usually better filled and have greater weight per bushel, and the shells are whiter.¹⁰ It has been found that for proper development, the young peanuts require immediate contact with soil well supplied with calcium. If calcium is supplied only to the roots, and soil surrounding the pegs are deficient in calcium, the kernels fail to develop and most of the pegs produce hollow shells. On soils which lack calcium the best production will be obtained by applying 400 pounds of dolomitic limestone in the row and sidedress by adding 50 to 100 pounds of muriate of potash on the top of the row as peanuts come through the ground. Larger applications of potash may decrease yields and quality of nuts. Potash should not be applied when plants are wet.¹¹

V. Soil Management

Peanuts are a legume and store nitrogen in nodules attached to the root as shown in (Figure 2). In common with

10.

Beattie, Op. Cit., p. 8.

11.

E. R. Collins and H. D. Morris, Soil Fertility Studies with Peanuts, Bulletin No. 330, The Agriculture Experiment Station of the North Carolina State College of Agriculture and Engineering and North Carolina Department of Agriculture, Cooperating, State College Station, Raleigh, North Carolina, June, 1941, p. 4.

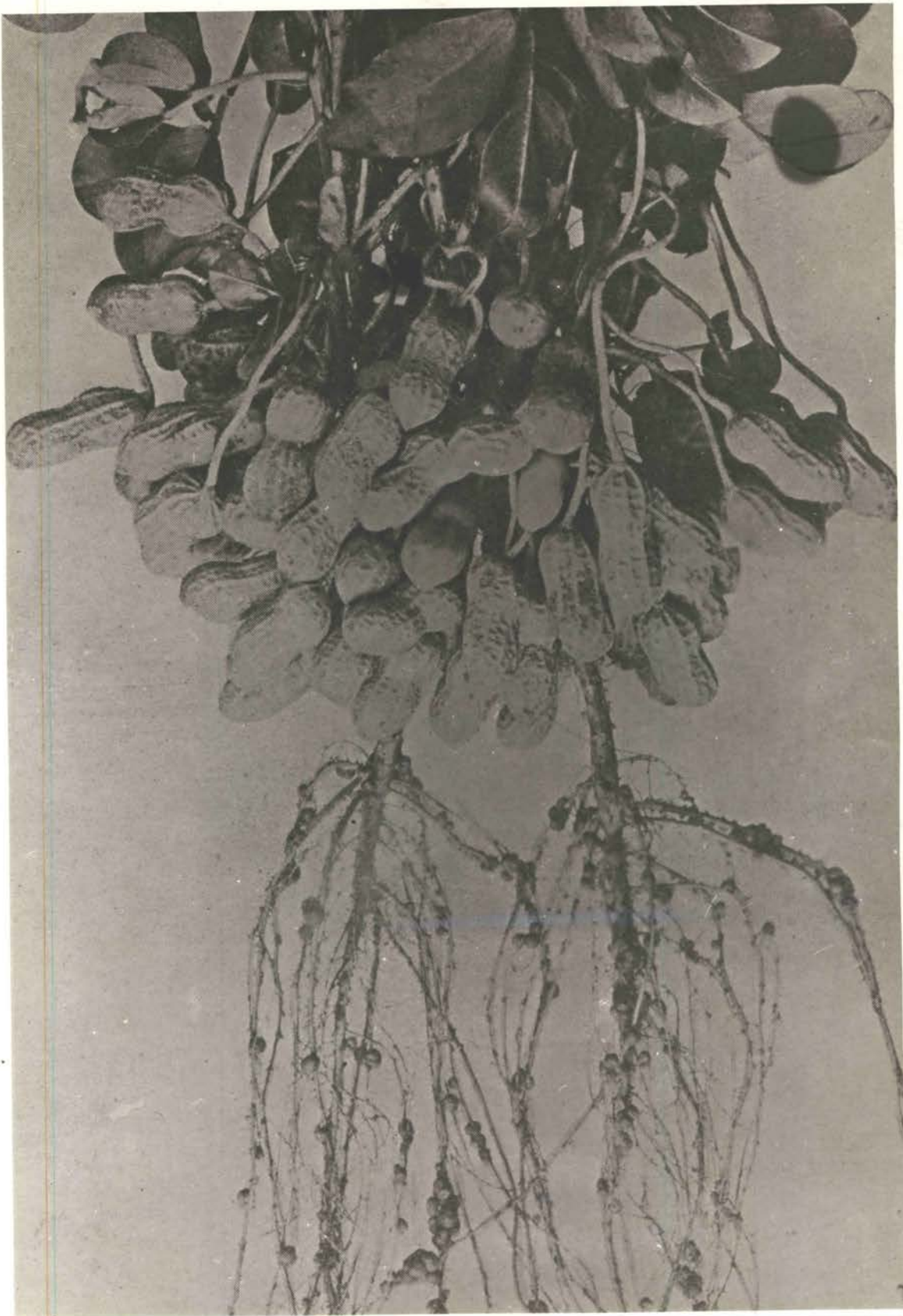


Figure 2 - Peanut plant, showing vines, nuts, and roots with nodules. (U. S. Department of Agriculture Photograph.)

other legumes, they are in this respect soil builders. However, the present method of harvesting removes the vine with the peanut attached and usually the entire root. When this happens the stored nitrogen is lost to the soil. Some farmers use an implement that cuts the taproot just under the peanut, leaving much of the root in the ground. Peanut harvesting machinery is not well advanced and improvements that are being made are increasingly designed to leave as much of the root in the ground as possible.

The peanut crop also removes large quantities of plant nutrients from the soil. The depleting effect of peanuts on the land was clearly shown in experiments conducted at the Oklahoma Experiment Station. On land where a legume was harvested, the yield of spring oats in 1944 averaged 36.6 bushels following hairy vetch; 33.4 bushels following cowpeas¹², and only 20.9 bushels following peanuts. Experiments in Alabama show that harvesting peanuts for several successive years from a field ruined the land to such an extent that a good cotton fertilizer 6-8-4 or 6-8-8 used at the rate of 600 pounds per acre did not produce a satisfactory cotton crop. In this experiment it was found that peanuts "hogged off" actually increased the yield of the

12.

Chaffin, Op. Cit., p. 4.

13
 following crop. When peanuts are harvested this way, the root is left in the ground and the vine remains to protect the soil from flowing.

Peanuts should not be planted on the same land more than once in three or four years and should be grown in a rotation which includes soil improvement crops for replenishing the organic matter in the soil. There are several satisfactory rotations which may be used. A good rotation for eastern Oklahoma is as follows:

1. Peanuts (rye seeded in the fall).
2. Rye (pastured or harvested for seed), and cowpeas
 crotalaria, or mung beans planted.
3. Cotton (vetch seeded between cotton rows after first
 picking). 14
4. Vetch pastured or plowed under and peanuts planted.

Another recommended rotation for Oklahoma is as follows:

1. Peanuts (rye and vetch seeded in the fall, sweet
 clover broadcast the following February).
2. Vetch seed saved as a cash crop. (Clover grazed the
 following fall and until first of next April).
3. Clover combined for seed.
4. Peanuts. 15

This program gives a legume crop two years out of three, and a cash crop every year. Rye and vetch are shallow crops, but sweet clover goes farther down and brings the lime and

13.

I. P. Wilson, The Effect of "Digging" and "Hogging" Peanuts on Cotton Yields, Leaflet No. 18, Agriculture Experiment Station of the Polytechnic Institute, Alabama, 1939.

14.

Chaffin, Op. Cit., p. 5.

15.

Bruce T. Robb, The Outlook For Peanut Production In Oklahoma. Federal Reserve Bank of Kansas City, Research Department, November, 1946, pp. 19-20.

phosphorus from the sub-soil. Soil authorities insist that
 such a rotation program will build soil, not deplete it.¹⁶

There is universal agreement that it is not the depletion of soil fertility by the peanut, but rather soil erosion by wind and water after the peanuts are harvested that causes the principal damage to the soil. Like all legumes, the peanut leaves the soil loose. Peanuts are usually kept free of weeds and grass, and when the plant is dug and the nuts and hay removed, the land is left completely bare. This condition is illustrated in (Figure 4). This loose soil is left to the mercy of heavy rains and every wind that blows. Eastern Oklahoma by nature is somewhat rough and fall and spring rains usually are heavy. Under such conditions water erosion is very serious. But the damage to the soil from blowing is even greater. The state has its share of high winds, and February and March are usually windy months. Land that has been in peanuts literally blows away after the crop has been harvested unless given proper care.¹⁷

The two methods most commonly employed to control wind erosion are a cover crop and strip farming. Both methods are often used. The most satisfactory crops for winter cover are rye, hairy vetch, rye grass, and winter peas. Rye is especially adapted to sandy soils and can be grown throughout the state. It can also be planted later than either vetch or winter peas. An application of 150 to 200 pounds of super-

¹⁶. Ibid., p. 20.

¹⁷. Ibid., p. 18.

phosphate per acre should be applied on phosphorus-deficient soils where vetch or winter peas are planted. The superphosphate should be distributed with a fertilizer drill, or broadcast and disced into the soil before planting the legume.

As soon as peanuts are harvested, the cover crop is planted and with favorable conditions, sufficient growth will take place before freezing weather to protect the soil.

If peanuts are harvested too late for planting a winter cover crop, or if the fall is too dry to grow a cover crop, the land should be listed on the contour immediately after the nuts are removed and may necessitate stirring periodically during the winter and early spring.

The winter cover crops may be plowed under as green manure, utilized for pasture, or a seed crop may be harvested, and the residues used for soil improvement.

In order to further reduce the menace of both wind and water erosion, it is advisable to plant peanuts in alternate strips with some erosion-resisting crop such as grain sorghum, Sudan grass, rye, vetch, Austrian winter peas, or a summer legume. A suggested width of strips is eight rows of peanuts and four rows, or a strip equivalent to the width of four rows, of the erosion-resisting crop. In areas where wind erosion is a serious problem, sorghum or Sudan should be used and the stalks left on the land during the winter. In these areas, the strip cropping system may run on the
18
contour or east and west. The Government is now requiring

18. Chaffin, Op. Cit., p. 5.

in all new contracts with tenants renting Indian land in Caddo County that strip farming on a 50-50 basis be practiced when raising peanuts; that is, an equal number of rows of peanuts and sorghum or kaffir as the case may be. At the end of the growing season the heads of the strip crop are harvested but much of the stalk must be left for a wind-¹⁹ break.

Where peanuts are grown on sloping soils, all tillage operations including plowing, planting, and cultivating should be on the contour. The small furrows and ridges resulting from these operations retain more of the water where it falls and facilitates its entrance into the soil. This gives a more even distribution of rainfall and increases the amount of moisture available for crop use. Contour tillage²⁰ also aids in the prevention of soil loss due to erosion.

VI. Seedbed Preparation

Land for peanuts is prepared in the same manner as for cotton, corn, or other row crops. The land should be plowed early enough to allow sufficient time for the decay of crop residues and the release of plant nutrients in the soil before the peanuts are planted. A cover crop when grown should be turned under at least two weeks before planting. Listing

19.

Robb, Op. Cit., p. 19.

20.

Chaffin, Op. Cit., p. 19.

or re-listing is a common practice in sections where soil blowing is likely to occur, and in these sections, it is not advisable to prepare the land early. The seedbed should be completely free of grass and other vegetable growth at the time of planting. Careful seedbed preparation insures a²¹ more uniform stand and reduces production costs.

VII. Quality of Seed and Seed Treatment

No. 1 shelled seed types yield more nuts than peg or unshelled seed. In three tests in which the number of plants per row were equivalent, No. 1 machine shelled Spanish seed produced 216 pounds per acre more nuts than small peg seed and 99 pounds more than medium peg seed. It is advisable to select clean, well matured, carefully cured, unshelled seed and have them shelled and treated by a reliable specialized²² seed sheller.

Peanut seed, when planted may be attacked by plant diseases which cause rotting of the seed and injury of the young seedling plants. The majority of these diseases are caused by fungi which live in the soil; however, some of them may be carried on the seed. The planting of infected seed, or the planting of clean seed in infected soils, often result in poor germination, thin stands, and weak plants.

21.

Ibid., p. 4.

22.

Recommendation For Preparing and Planting Seed Peanuts, Mimeographed Paper No. 30, Georgia, Coastal Plain Agriculture Experiment Station, Tifton, Georgia, March 13, 1945, p. 1.

Treating the seed with chemical dusts gives the peanut seed some protection against these soil and see-borne diseases. Seed treatment may sometimes mean the difference between a satisfactory stand and replanting, particularly when poor growing conditions follow planting, such as a cold, wet period. Experiments indicate that by using seed treatment, it is possible to safeguard the seed against disease, improve germination, and thus increase yields.

Increases in yields of treated seed over untreated seed have ranged from 7 percent for hand-shelled seed to 29 percent for machine-shelled seed at the Georgia Experiment Station. Reports indicate, that in 1943, the average yield was increased 150 pounds of peanuts per acre on 40,000 acres²³ planted with treated seed in North Carolina. Machine shelled seeds treated by the Florida Experiment Station in 1943-1944 produced from 25 percent to 32 percent more peanuts²⁴ than non-treated seed.

The chemical dusts for treating peanut seed, listed in the order of the effectiveness, are: (1) arasan, (2) 2% ceresan, (3) yellow cuproside, and (4) spergon. The directions given on the package containing the chemicals should be carefully followed. One and one-half ounces of dust is enough to treat a bushel of seed. The dust may be mixed in a

23.

Chaffin, Op. Cit. p. 6.

24.

W. B. Tisdale, Treat Peanut Seed For Better Stands, Press Bulletin No. 610, University of Florida, Agriculture Experiment Station, Gainesville, Florida, January, 1945, p. 2.

barrel, box, or in any kind of closed container which will²⁵
 permit a thorough mixing of the chemical with the seed.

Cost of treatment is very low. It is more economical to
 machine shell the seed and treat it than to hand shell and
 not treat.

If planted immediately after treatment, arasan and 2%
 ceresan treated seed give the best yield, but if stored 60
 days after treatment the 2% ceresan and spergon give lower²⁶
 yields than arason treated seed.

Treatment should be done out-of-doors or in a well ven-
 tilated building to avoid inhaling the dust or fumes. A
 dust mask or handkerchief should be worn over the nose while
 treating seed. Ceresan and yellow cuproside dusts are very
 poisonous and should be handled with great care. Ceresan will
 cause burns if left on the skin. Arasan and spergon are re-
 latively non-poisonous and are less dangerous to use than
 ceresan or yellow cuproside. Treated seed should not be used²⁷
 for livestock feed.

The protection of seed from rodents, can be accomplished
 by sprinkling a mixture of equal parts of pine tar and kero-²⁸
 sene over the seed before planting.

25. Chaffin, Op. Cit., p. 6.

26. Tisdale, Op. Cit., pp. 1-2.

27. Chaffin, Op. Cit., p. 6.

28. George W. Carver and Austin W. Curtis Jr. The Pea-
 nut, Bulletin No. 44, Research and Experiment Station,
 Tuskegee Institute, Alabama, February, 1943, p. 4.

VIII. Date of Planting

Seed should not be planted until the soil has become warm. Cotton planting time (May 1 to June 1) is the proper time for planting peanuts. The Spanish variety matures rapidly, and can be planted somewhat later than the larger varieties.²⁹

IX. Rate and Method of Planting

Close uniform stands are necessary for maximum yields of Spanish peanuts. Plants spaced three inches apart in the row yield more nuts than wider spacings. An average increase of 131 pounds per acre was obtained in tests in which three inch spacing was compared with six inch spacing.³⁰ Spacing three inches in the drill requires a heavier rate of seeding than is commonly used. Rows from 24 to 30 inches wide will require approximately 55 to 65 pounds of shelled Spanish peanuts per acre.

The planting of shelled seed is rapidly becoming a general practice in Oklahoma. Shelled seed, which has been carefully graded to eliminate small kernels, plants more easily, germinates quicker, and gives a more even stand of plants than unshelled seed.

Peanuts may be planted by hand or by machinery, in rows

29. Chaffin, Op. Cit. p. 7.

30. Recommendations For Preparing and Planting Seed Peanuts, Mimeographed Paper No. 39, Georgia Coastal Plains Agriculture Experiment Station, Tifton, Georgia, March 13, 1945, p. 1.

from 24 to 30 inches wide. A peanut plate may be secured for almost any standard type planter. The seed should be covered to a depth of one and one-half to two inches in light, sandy soils, and somewhat less in heavier soils. If the soil contains plenty of moisture, the depth should be less than if dry.³¹

X. Cultivation

Cultivation should begin as soon as the plants are up and should continue as often as necessary to control grass and weeds. As soon as the soil is reasonably dry after a rain the surface should be stirred. The first cultivation can often be done with a harrow; subsequent operations may be done with a 5-tooth cultivator, sweeps, and ordinary row implements. After the vines have begun to bloom and "peg down," they should not be disturbed and only the middles should be cultivated. By working the soil toward the rows during cultivation a broad flat bed of loose soil will be formed along the row providing a suitable bed in which pods can readily be formed. This will leave a water furrow between the rows. At least one hand hoeing will be necessary. The best time to do this is usually about the time the plants begin to spread or after the third cultivation.³²

31. Chaffin, Op. Cit., p. 7.

32. Ibid., pp. 7-8.

Shoveling soil over the center of the peanut plants injures the quality of the hay, and it is doubtful whether a greater number of pods are formed.³³

XI. Harvesting and Curing

Peanuts must be dug at the proper time to obtain the maximum yield. If dug too early, the kernels shrivel; if digging is delayed, some will be sprouted. Harvesting should be done before the vines are killed by frost. When the leaves begin to turn yellow, the peas are full-grown, and the inside of the shells has begun to color and show darkened veins the peanuts are mature and ready for harvest.

Peanut vines should be loosened from the soil by means of a sharp implement that will cut the tap root just below the cluster of peanuts and leave a portion of the root system in the soil. There are several peanut diggers of the plow type on the market. Special peanut points that can be adapted to a turning plow from which the moldboard has been removed are also available. Local blacksmiths can use a piece of steel, such as a car spring, to make a blade cutter that can be fastened to the cultivator shanks and used for digging. The sharp blade cuts the tap root below the peanuts and leaves the vines erect. This method does not disturb the soil as much as when a turning plow or sweep is used.

33.

Beattie, Op. Cit., P. 15.

After the peanut vines are loosened, they should be lifted out and the soil shaken off. They should then be spread out on the ground or left in small bunches until the leaves are slightly wilted, after which they may be stacked around poles for curing. Digging should not begin in the morning until the vines are dry, and no more should be dug than can be placed in stacks during the day. It is not advisable to undertake to cure peanuts in wind rows.³⁴

A large part of the direct cost of peanut production is incurred in harvesting, curing, and picking. Methods now used in such operations are primitive as compared with the mechanization used in handling other crops. Great economic gains can be made through research and development on mechanization. Much has already been accomplished in this direction. As a single example, a two-row tractor operated machine developed by the U. S. Department of Agriculture Soil Tillage Laboratory at Auburn, Alabama, can dig, shake, and windrow 25-30 acres of peanuts a day, thus requiring³⁵ about one-half man-hour per acre for the operation.

Other machines designed to perform the same operations are also in advanced stages of development, although, so

34. Chaffin, Op. Cit., pp. 9-10.

35. J. F. Reed and O. A. Brown. "Developments In Peanut Harvesting Equipment." Agricultural Engineering, Volume 25, U. S. Department of Agriculture, Soil Tillage Laboratory, Auburn, Alabama, 1944, pp. 125-126.



Figure 3 - Stacking peanuts around a pole. The stack is built by piling the vines around the pole by hand, keeping the peanuts close to the pole. The center of the stack is kept higher than the edges. (Oklahoma Agricultural experiment Station Photograph.)

far as is known, none of these machines is yet available
³⁶
 commercially.

Poles for stacking are usually three to four inches in diameter and seven to nine feet long. From 15 to 25 poles are required per acre, depending upon production. The poles are set about two feet in the ground. Two crosspieces, about three feet long, are nailed to the poles about 12 to 14 inches above the ground to support the vines and provide ventilation. In starting the stack a few vines are hung over each of the crosspieces to form a foundation. The stack is built by piling the vines around the pole by hand, keeping the peanuts close to the pole, as shown in (Figure 3) page 42. The center of the stack should be kept higher than the edges so that the stack may shed water. In order to provide free circulation of air and to prevent the possibility of the nuts heating and souring in the stacks, they should not be more than three or four feet in diameter and six to seven feet in height. As the stack nears completion it should be gradually drawn to a point and a few vines crowded down over the sharpened top of the stack. Dry grass or weeds may be placed on top of the stack to turn the water. From three to six weeks are required for peanuts to cure in the stack.
³⁷ Typical stacks of peanuts are shown (Figure 4) page 44.

³⁶.

Wrenshall, Op. Cit. A Survey of the Research Status of the Peanut Industry. p. 16.

³⁷.

Beattie, Op. Cit., pp. 17-21.



Figure 4 - Stacks of peanuts standing in field from which nuts have been harvested. Note the loose condition of the soil. (Oklahoma Agriculture Extension Service Photograph.)

XII. Picking and Storage

Picking the commercial peanut crop is done mainly during October, November, and December. Peanuts can be picked satisfactorily only when the vines are brittle, as damp weather causes them to be tough and the pods difficult to detach.

The most successful method of separating the nuts from the vines on a commercial scale is by the use of a regular peanut picking machine. The capacity of peanut-picking machines depends upon the make of machine and the condition of the peanuts; about 250 bushels per day is the average.

Peanuts are sometime removed from the vines by grain-thrashing machines, having a special cylinder adapted to handling peanuts. However, the percentage of splits, cracked pods, and trash is greater than with specially designed pickers.³⁸ In addition to removing the pods from the vines, the machines have special facilities for cleaning the pods and taking off the small stems. These pickers operate on the same basis as thrashing machines. They move from farm to farm, and the picking is done at a set price per bushel. The picker is usually set at a convenient point near the center of the field. Stacks of peanuts are loaded on low-wheeled wagons and hauled to the picker. During the unloading the poles are drawn out and thrown to one side.

³⁸.

Clay, Op. Cit., pp. 9-10.

Slow uniform operation of the picking machine will give best results as to both quality and quantity of peanuts, and if the vines are either damp or extremely dry the machine will need to be adjusted to suit their condition.³⁹

Small crops can be picked by the use of an easily constructed homemade picker. Such a picker has been made in Arkansas for picking peanuts. By this method two men can pick as much as 1,500 pounds of peanuts in a day. This peanut picking machine is constructed from a few pieces of board, four feet of 30-inch wide one inch mesh poultry wire and six feet of 30-inch wide one-fourth inch hardware cloth. These pieces are put together with nails, staples, screws, or bolts. Blueprints for such pickers may be obtained from the U. S. Agricultural Engineering Department.⁴⁰

As the peanuts come from the picker they usually contain considerable moisture and should be sacked immediately to prevent loss from heating. Unless marketed immediately, peanuts should be stored in a well-ventilated building. The bags should be stacked so as to permit free circulation of air. They should not be piled directly on the floor, but should be placed on poles or other suitable supports to provide ventilation. The peanuts should be protected from the ravages of rats, mice and other rodents.⁴¹

39.

Beattie, Op. Cit. p. 24.

40.

Earl K. Rambo, Homemade Peanut Picker, Extension Plan Series No. 2, University of Arkansas, College of Agriculture, U. S. Department of Agriculture Cooperating, August, 1942.

41.

Chaffin, Op. Cit., pp. 10-11.

XIII. Peanut Hay

As a rule, a baling machine is employed either in conjunction with the picker or following behind and packing the peanut hay into bales. Peanut hay should be baled when dry and the bales stored where they will not be exposed to the weather.

Peanut hay possesses high feeding value and compares favorably with alfalfa, cow-pea vines, crimson and bur clover.⁴² Experiments carried out at the Oklahoma Agriculture Experiment Station show that peanut hay is equal to alfalfa for dairy cows. In these experiments, good quality peanut hay was compared with alfalfa of a similar quality and the results showed that the peanut hay was equal to the alfalfa in maintenance of body weight, milk yield, and amount⁴³ needed to produce 100 pounds of milk.

A similar experiment at the South Carolina Agricultural Experiment Station shows that peanut hay is equal to, or better than, soybean hay for feeding dairy cows. In this experiment good, bright peanut hay was compared against a similar high quality soy bean hay. Cows gained more weight.

42.

George W. Carver, How to Grow the Peanut and 105 Ways of Preparing It for Human Consumption. Bulletin No. 31 Experiment Station, Tuskegee Institute, Alabama, June, 1925, Eighth Edition, January, 1942, p. 7.

43.

A. H. Kuhlman and H. W. Cave, Thrashed Peanut Hay as a Roughage for Dairy Cows, Mimeographed Circular No. M-128, Oklahoma Agriculture Experiment Station, Oklahoma A. & M. College, Stillwater, Oklahoma, August, 1944, pp. 1-4.

on the peanut hay and produced slightly more milk. The price of peanut hay usually runs about one-third less than soybean⁴⁴ hay.

Hay of excellent color with little or no loss of leaves can be obtained if the crop is harvested before frost and plants with attached nuts are placed in tall cylindrical piles about the stakes as recommended for curing. Hay from peanuts cured by the use of a side delivery rake is usually very badly damaged by weather unless great care is used and the weather is very favorable. Most of the thrashed hay obtained by this method is badly discolored, very stemmy, dirty, and dusty, and rather unpalatable. Low grade peanut hay probably is similar to straw in palatability and feeding⁴⁵ value.

In Oklahoma, peanuts produce, on the average, about three-fourths of a ton of hay to the acre and the common opinion is that hay covers all expenses of producing peanuts. In 1936, peanut hay was worth from \$20 to \$25 a⁴⁶ ton.

44.

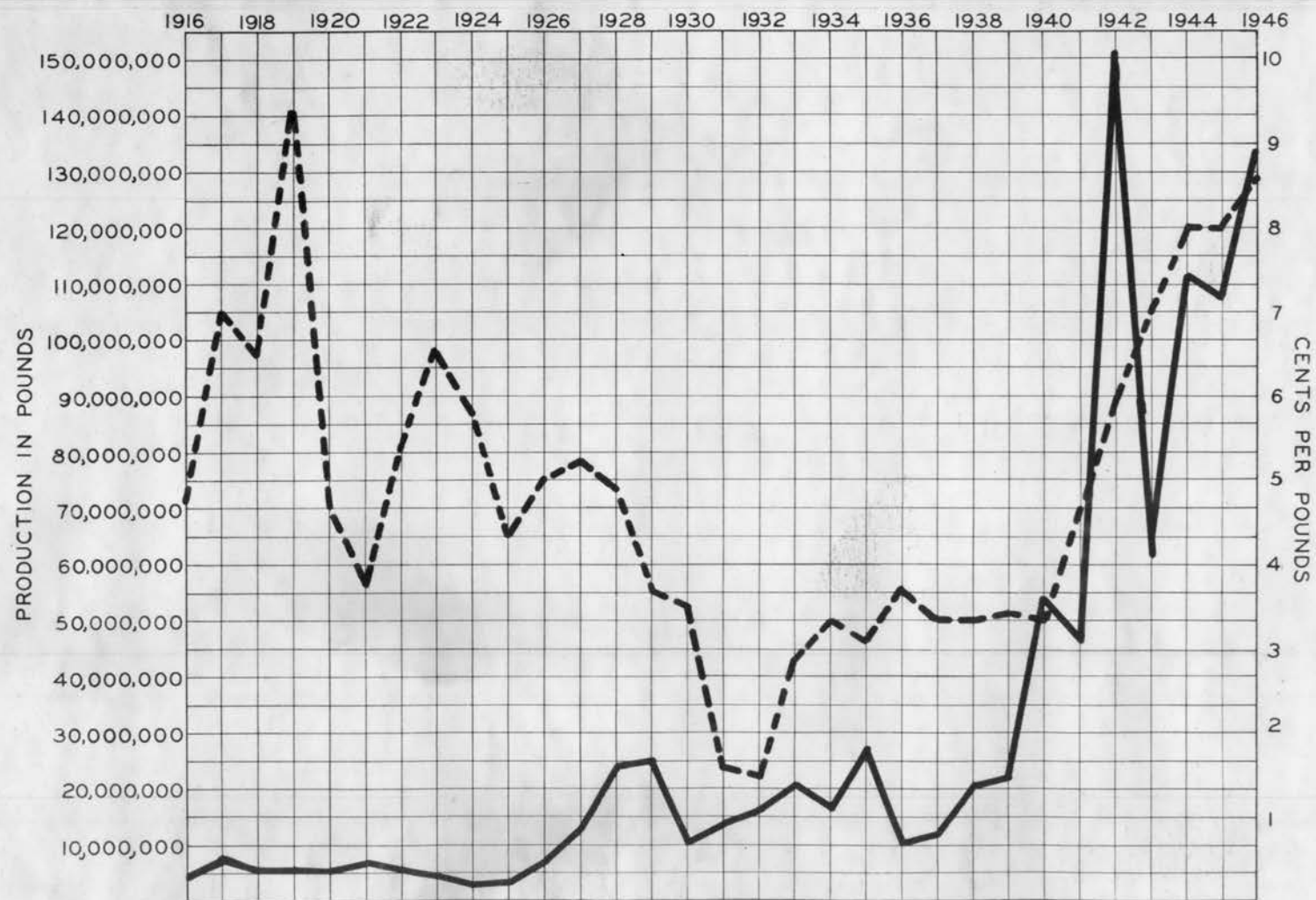
C. D. Grinnells, and J. L. Moore, The Comparative Values of Peanut and Soybean Hay for Milk Production, Bulletin No. 312, The Agricultural Experiment Station of the North Carolina College of Agriculture and Engineering, and North Carolina Department of Agriculture, Cooperating, August, 1937.

45.

Kuhlman, Op. Cit., pp. 1-5.

46.

Robb, Op. Cit., p. 13.



PEANUTS - PRODUCTION - PRICE

— PRODUCTION
 - - - PRICE

IN POUNDS
 1916 - 1946

CHAPTER IV

PEANUT PRODUCTION

While limited amounts of peanuts have been grown in Oklahoma for many years, for the most part in the southeastern section, the crop is a comparatively new one for much of the state. Prior to 1940, the importance of peanuts as a farm crop was relatively small.

Oklahoma produced an average of only 555,000 pounds of peanuts annually in the pre-war years from 1909 to 1913. Most of these were peanuts produced for home consumption and for livestock feed. An increase in production during and after World War I, gave a yearly average of 7,831,000 pounds for the 16 year period from 1914 through 1929, which sold at an average price of 5.3 cents per pound. This was less than one percent of the national production for the same time.

The average annual acreage of peanuts for the 10-year period, 1930-39 was 56,000 acres which produced an average of 16,814,000 pounds. This was a sharp increase in production even though the average price was only three cents per pound, or 44 percent below the previous 16 year average. No other crop in the state made such a gain in production¹ during the depression years.

1. Agricultural Statistics. U. S. Department of Agriculture, Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 1930-1939.

The graph (Figure 5) shows that peanut production in the state has experienced a slow but steady increase from the early days of state hood through 1939.

Although this country was not yet at war, production increased sharply in 1940 and 1941. War in the Pacific cut off large supplies of vegetable oils at a time when the demand for fats and oils was increasing. The drive to increase peanut production got underway in 1942, the nation's crop for that year being nearly $2\frac{1}{2}$ billion pounds. Oklahoma production jumped from 46 million pounds in 1941 to 151 million in 1942. This 1942 figure for Oklahoma was nearly seven times that of 1939. A patriotic appeal to farmers to raise peanuts, together with a guaranteed farm price of about eight cents a pound in recent years accounted for the increased production.² Oklahoma farmers planted 330,000 acres to peanuts in 1942, and 617,000 acres in 1943. Because of the extremely unfavorable growing conditions in 1943, Oklahoma produced less than 62 million pounds of peanuts. Only 337,000 acres were planted in 1944. This 1944 crop produced more than 111 million pounds of peanuts. Oklahoma farmers produced 108 million pounds of peanuts from 268,000 acres in 1945 and about 133 million pounds in 1946 from 290,000 acres. The table on page 52 gives yearly data for peanuts in Oklahoma since 1919.

². Bruce T. Robb, The Outlook For Peanut Production In Oklahoma, Federal Reserve Bank of Kansas City, Research Department, November, 1946, p. 12.

TABLE II

Acreage, Yield, Production, Price and Value of Peanuts
in Oklahoma, 1919-1946.

Year	Total Equiv. Solid Acreage	Picked and Thrashed Acres	Yield Har- vest- ed Pounds	Production Pounds	Season Average Price (Cents @ Pound)	Yearly Cash Income (Dollars)
1919	11,000	8,000	690	5,520,000	9.4	518,880
1920	10,000	7,000	750	5,250,000	4.7	246,750
1921	18,000	11,000	625	6,875,000	3.8	261,250
1922	18,000	11,000	525	5,775,000	5.4	311,850
1923	15,000	9,000	550	4,950,000	6.5	321,750
1924	10,000	5,000	650	3,250,000	5.8	188,500
1925	8,000	6,000	650	3,900,000	4.3	167,700
1926	12,000	8,000	800	6,400,000	5.0	320,000
1927	32,000	19,000	700	13,300,000	5.2	391,600
1928	75,000	37,000	650	24,050,000	4.9	1,178,450
1929	102,000	50,000	500	25,000,000	3.7	925,000
1930	41,000	24,000	425	10,200,000	3.5	357,000
1931	56,000	32,000	425	13,600,000	1.6	217,600
1932	61,000	29,000	550	15,950,000	1.5	239,250
1933	46,000	33,000	625	20,625,000	2.8	377,500
1934	82,000	55,000	300	16,500,000	3.3	544,500
1935	66,000	45,000	600	27,000,000	3.1	837,000
1936	53,000	38,000	270	10,260,000	3.7	379,620
1937	35,000	25,000	475	11,875,000	3.3	391,875
1938	51,000	38,000	530	20,140,000	3.3	664,620
1939	71,000	53,000	415	21,995,000	3.4	767,830
1940	106,000	90,000	600	54,000,000	3.3	1,782,000
1941	110,000	88,000	525	46,200,000	4.7	2,171,400
1942	330,000	265,000	570	151,050,000	6.0	9,063,000
1943	617,000	275,000	225	61,875,000	7.1	4,391,847
1944	273,000	218,000	510	111,180,000	8.0	8,894,400
1945	268,000	225,000	480	108,000,000	8.0	8,640,000
1946*	290,000	221,000	540	119,340,000	8.6	10,163,240
Average			- 541			

* December, 1946 estimate.

Agriculture Statistics, U. S. Department of Agriculture,
Superintendent of Documents, U. S. Government Printing
Office, Washington, D. C., 1919-1946.

Peanut production by counties, for the year of 1944 are given in the table on pages 54 and 55 and the outstanding producing counties are illustrated by the map (Figure 6) page 56.

Although southeastern Oklahoma is still the heaviest producing area, peanut production has spread over much of the state since 1940. Many farmers have had the experience of growing the crop for the first time in recent years. This increased production and widespread growth is demonstrated by the map comparisons (Figures 7 and 8).

A very large amount of land in Oklahoma is naturally adapted to peanuts. The crop requires a sandy soil which is plentiful in Oklahoma, especially in large areas on both sides of the South Canadian River. This fact helps to explain Oklahoma's increased growth in peanut production.⁴

The 1945 peanut crop brought a total of \$8,856,000 to Oklahoma farmers,⁵ and a crop of hay valued at \$1,028,702. These figures do not include the 20,000 acres of peanuts used on the farms.⁶ The 1946 peanut crop brought more than 10 million dollars to Oklahoma producers. The yearly cash income from peanuts for the state are shown by the table on page 52.

4. Robb, Op. Cit., p. 1.

5. Agricultural Statistics, United States Department of Agriculture, Superintendent of Documents, United States Government Printing Office, Washington, D. C., 1946.

6. U. S. Census of Agriculture, Volume I, Part 25, Oklahoma. Bureau of Census, U. S. Department of Commerce, Washington, D. C., 1945.

TABLE III
OKLAHOMA PEANUTS
Acreage, Yield, Production -- 1944 by Counties

County	Acreage/ ³ Grown For All Purposes	PICKED AND THRESHED FOR NUTS		
		Acreage	Yield	Production
	<u>Acres</u>	<u>Acres</u>	<u>Pounds</u>	<u>Pounds</u>
Adair	-	-	-	-
Alfalfa	-	-	-	-
Atoka	12,200	9,600	399	3,834,000
Beaver	-	-	-	-
Beckham	300	230	600	138,000
Blaine	1,100	900	710	639,000
Bryan	30,000	27,700	423	11,713,000
Caddo	16,000	11,900	796	9,473,000
Canadian	1,200	1,000	816	816,000
Carter	6,500	4,400	338	1,486,000
Cherokee	100	70	571	40,000
Choctaw	9,500	6,700	329	2,201,000
Cimarron	-	-	-	-
Cleveland	1,900	1,600	450	720,000
Coal	6,000	5,300	347	1,838,000
Comanche	1,700	1,500	515	772,000
Cotton	1,200	900	422	380,000
Craig	-	-	-	-
Creek	7,400	4,900	523	2,565,000
Custer	600	400	688	275,000
Delaware	-	-	-	-
Dewey	-	-	-	-
Ellis	-	-	-	-
Garfield	-	-	-	-
Garvin	9,900	6,600	577	3,807,000
Grady	10,300	6,600	585	3,861,000
Grant	-	-	-	-
Greer	1,000	700	520	364,000
Harmon	1,400	1,000	568	568,000
Harper	-	-	-	-
Haskell	3,500	3,100	493	1,527,000
Hughes	14,200	11,800	609	7,191,000
Jackson	1,800	1,300	635	825,000
Jefferson	2,000	1,100	405	445,000
Johnston	6,900	5,800	364	2,110,000
Key	-	-	-	-
Kingfisher	700	500	700	350,000
Kiowa	800	500	692	346,000
Latimer	1,200	1,100	426	469,000

OKLAHOMA PEANUTS (cont'd.)
Acreage, Yield, Production -- 1944 by Counties

County	Acreage/ ³ Grown For All Purposes	PICKED AND THRESHED FOR NUTS		
		Acreage	Yield	Production
	<u>Acres</u>	<u>Acres</u>	<u>Pounds</u>	<u>Pounds</u>
LeFlore	2,200	1,900	462	877,000
Lincoln	7,500	5,600	630	3,527,000
Logan	1,100	1,000	665	665,000
Love	4,100	3,500	426	1,491,000
McClain	5,100	4,500	617	2,775,000
McCurtain	4,900	3,800	426	1,619,000
McIntosh	5,400	5,200	688	3,576,000
Major	400	230	735	169,000
Marshall	1,500	1,500	435	652,000
Mayes	-	-	-	-
Murray	2,300	1,800	355	639,000
Muskogee	3,600	2,800	577	1,615,000
Noble	-	-	-	-
Nowata	-	-	-	-
Okfuskee	10,000	7,500	477	3,574,000
Oklahoma	1,500	1,300	541	703,000
Okmulgee	7,200	6,100	454	2,771,000
Osage	800	500	844	422,000
Ottawa	-	-	-	-
Pawnee	800	600	798	479,000
Payne	1,800	1,500	754	1,131,000
Pittsburg	11,000	8,800	585	5,149,000
Pontotoc	5,000	4,300	399	1,717,000
Pottawa- tomie	9,800	7,200	461	3,322,000
Pushmataha	5,800	5,200	333	1,730,000
Roger Mills	100	70	614	43,000
Rogers	600	300	647	194,000
Seminole	13,800	13,100	497	6,510,000
Sequoyah	1,300	1,200	532	639,000
Stephens	10,000	7,600	549	4,170,000
Texas	-	-	-	-
Tillman	1,300	1,100	559	615,000
Tulsa	2,300	1,300	582	756,000
Wagoner	800	500	628	314,000
Washington	-	-	-	-
Washita	1,100	700	739	517,000
Woods	-	-	-	-
Woodward	-	-	-	-

³ Total Equivalent Solid Acreage (Alone plus one-half interplanted) Source: U. S. Department of Agriculture, 1944.

I. Peanut Shelling Plants and Oil Mills

To parallel the expanding growth in peanut production in Oklahoma, a number of peanut shelling plants and oil mills for crushing peanuts have been established in various places in the state. These establishments furnish a market for farmers' stock peanuts in the local area and collect peanuts from the various warehouses throughout the peanut producing area, see (Page 69).

Oklahoma supports seven peanut shelling plants at the present time. The oldest of these is the Durant Peanut Company, established at Durant, Oklahoma, in the fall of 1928. This has been the heaviest peanut producing area in the state for many years and has furnished a large supply of Spanish peanuts for shelling purposes.⁷ In 1940 the Bristow Peanut Company established a large shelling plant at Bristow, Oklahoma. This plant was moved to Bristow from the Texas-Oklahoma line. Before this time the area surrounding Bristow⁸ produced few peanuts for commercial use. The Woldert Peanut Producers Company established a peanut shelling plant⁹ at Hugo, Oklahoma during recent years.

7. John Haskins, (Vice-President) Durant Peanut Company, Durant, Oklahoma, Personal Letter to the Author, April 7, 1947.

8. Ralph McMillen, (Manager) Bristow Peanut Company, Bristow, Oklahoma, Personal Letter to the Author, April 26, 1947.

9. Haskins, Op. Cit., Personal Letter to the Author.

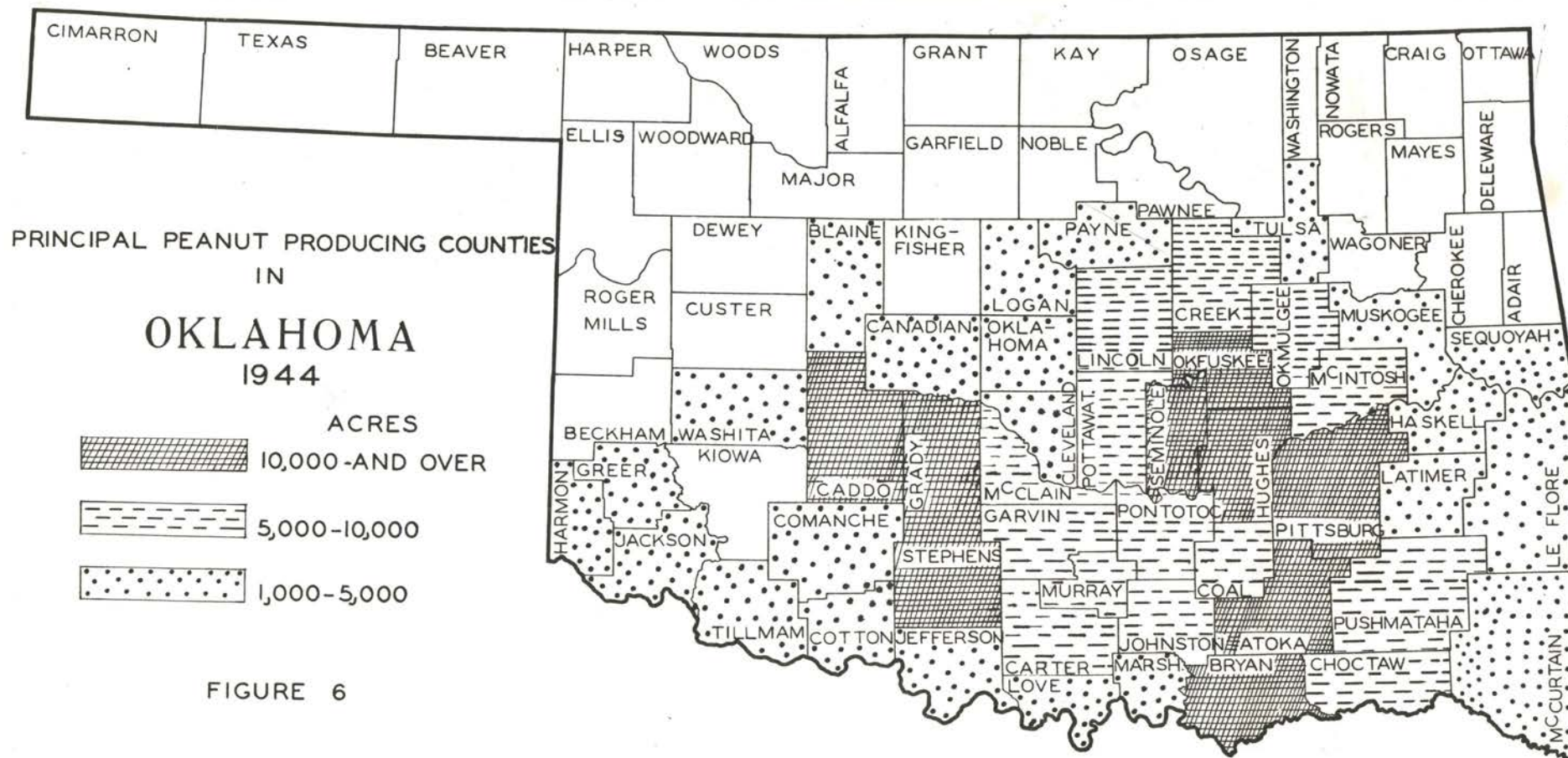


FIGURE 6

OKLAHOMA PLANNING AND RESOURCES BOARD
AND
U.S. DEPTMENT OF AGRICULTURE

The other four peanut shelling plants in Oklahoma are as follows:

1. Konawa Peanut Company, Konawa, Oklahoma, established July 1, 1945.¹⁰
2. Swift and Company Peanut Shelling Plant, purchased from Bain Peanut Company in Durant, Oklahoma, 1935.
3. Okmulgee Nut Company, established at Okmulgee, Oklahoma, 1946.
4. Shawnee Shelling Plant, established in 1946, at Shawnee, Oklahoma.¹¹

There are at least four oil mills crushing peanuts in Oklahoma. They are located as follows:

1. The oil mill in connection with Konawa Peanut Company, began crushing peanuts for oil in February, 1946.
2. The Shawnee Oil Mill, in connection with the Shawnee Shelling Plant, started operating in 1946.¹²
3. Choctaw Cotton Oil Company, McAlester, Oklahoma.
4. Durant Cotton Oil Mill, Division of the Lone Star Cotton Oil Company, Durant, Oklahoma.¹³

II. Peanut Production Compared With Cotton Production In Oklahoma

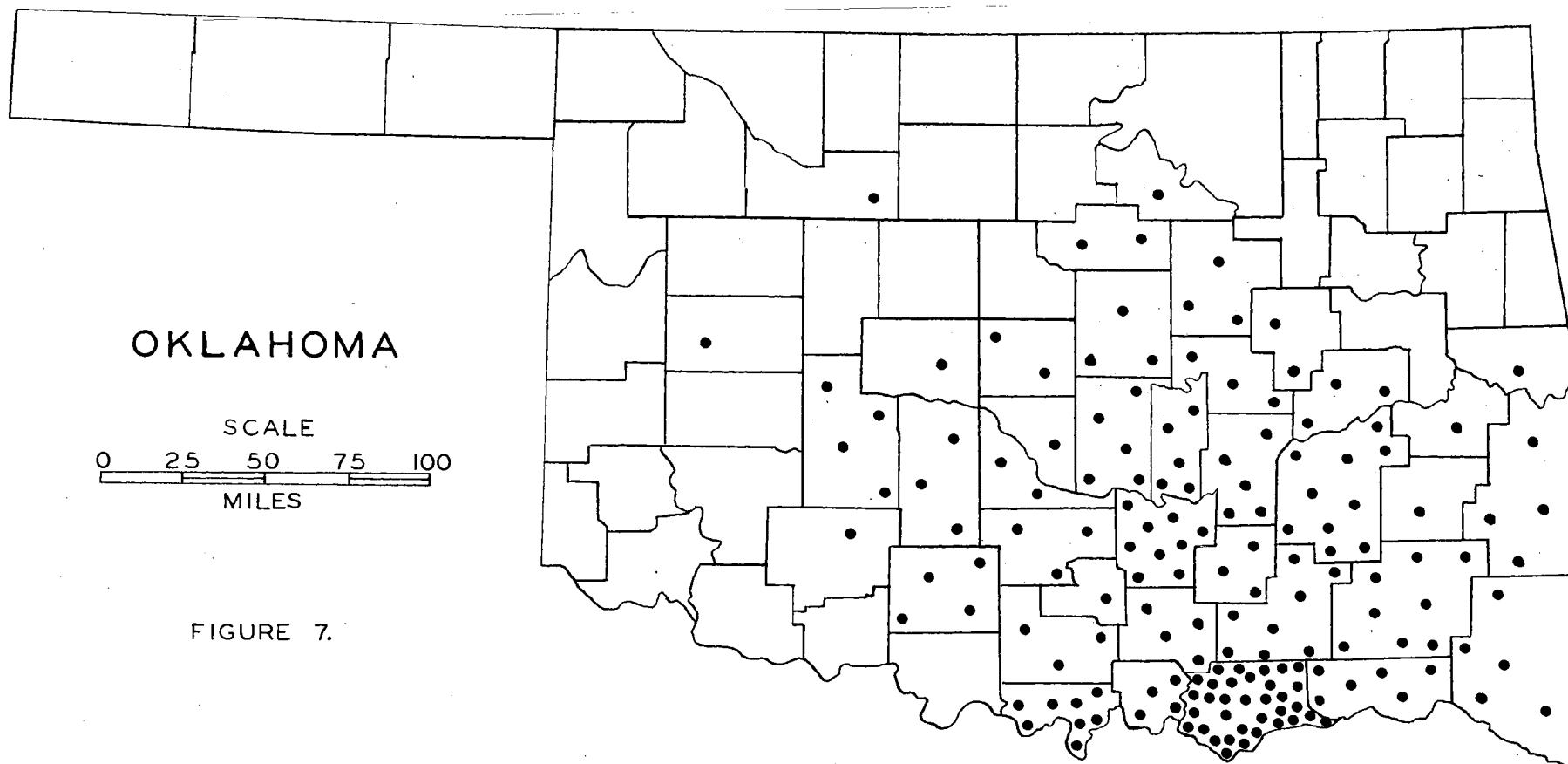
Cotton has been the great cash crop of Oklahoma. In the 23 years from 1911 to 1935, Oklahoma produced 14 cotton

10. J. R. Wehrung, (Office Manager) Konawa Peanut Company, Inc., Konawa, Oklahoma, Personal Letter to the Author, May 10, 1947.

11. E. D. David, (Manager). Southwestern Peanut Growers Association, Gorman, Texas, Personal Letter to the Author, May 5, 1947.

12. Ibid. Personal Letter to Author.

13. Haskins, Op. Cit., Personal Letter to Author.



OKLAHOMA

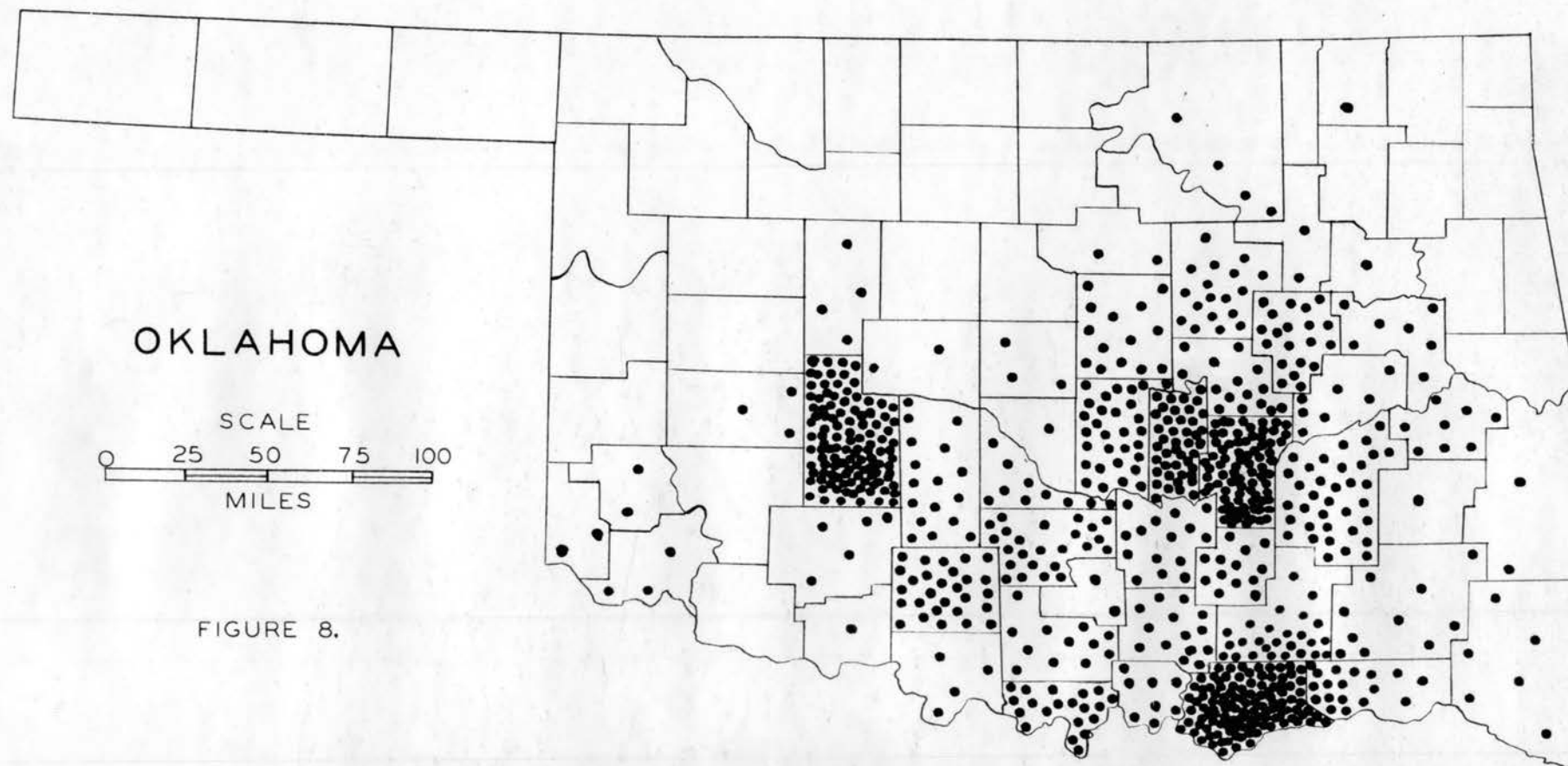
SCALE
0 25 50 75 100
MILES

FIGURE 7.

• EACH DOT REPRESENTS 100,000 POUNDS OF HARVESTED PEANUTS

PEANUT PRODUCTION IN OKLAHOMA
PRODUCTION BY COUNTIES
1934

FROM U.S. BUREAU OF CENSUS
1934



• EACH DOT REPRESENTS 100,000 POUNDS OF HARVESTED PEANUTS

PEANUT PRODUCTION IN OKLAHOMA
PRODUCTION BY COUNTIES
1945

FROM U. S. BUREAU OF CENSUS
1945

crops that exceeded a million bales. The average value of the cotton crop for those 23 years was \$1 million dollars, an amount greater than the value of any other crop in the state. In addition, the cottonseed cake is an extremely valuable protein feed for livestock; and cotton seed oil was the country's most important vegetable oil until 1944 when soybean oil took first place.

But a great change has taken place in cotton production in Oklahoma since 1933. In the last 12 years the cotton crop of the state has averaged only 548,000 bales, and the 1945 crop was only 285,000 bales. In the last year or two weather conditions at planting time have not been favorable, and in the eastern part of the state, especially, the boll weevil ate most of the cotton that did start growing. The boll weevil hibernates in thickets and woods and in recent years has done great damage in eastern Oklahoma. Cotton requires a great deal of labor. Manpower difficulties, also, have been an important factor contributing to the decline in cotton production. A few samples of the decline in cotton production supplied by bankers and others will show what has happened to cotton. One county at one time raised 66,000 bales, while in 1945 the crop was only 2,000. In a small town 14,000 bales had been ginned, but in 1945 only 300 were ginned. In another place 11,000 bales had been ginned, but only 400 in 1945. In still another small town five cotton gins had ginned as high as 20,000 bales, but in 1945 only 800 bales were ginned.

Many people in eastern Oklahoma feel that cotton is on the way out in that area. Cotton in eastern Oklahoma is raised mostly in small patches and these farmers do not have the money or equipment to poison the boll weevil. It is believed that the production of cotton will, more and more, be mechanized and the five acre cotton patches of that area do not lend themselves to this kind of farming.

In many ways peanuts and cotton are competitive crops and a very large number of farmers in sections where the land is adapted to peanut culture are turning from cotton to peanuts. In a livestock program there is a place for a cash crop, and peanuts qualify well in this respect. As already indicated, an acre of peanuts produces nearly three quarters of a ton of hay that has few superiors for livestock feed. As a producer of hay, peanuts excel cotton in a livestock economy and the nuts themselves are excellent feed for livestock and poultry. When peanuts are crushed for oil, the peanut cake makes a protein feed practically the equal of cotton seed cake. A protein feed is necessary to get cattle through the winter. But the quantity of peanut cake has not been large, for not many peanuts have been crushed for oil in Oklahoma.

Many farmers raise peanuts in preference to cotton. While the digging and thrashing of peanuts is dirty work and

14.

Robb, Op. Cit., pp. 22-23.

may require as much labor as raising cotton, if threshers are available, the peanut crop can be disposed of during a shorter period of time than cotton. Reports gathered from eastern Oklahoma farmers in 1942 show that peanuts, sold at edible nut prices, made a profit greater than that obtained from cotton. This same report shows that farmers using tractors in southwestern Oklahoma, produced peanuts with less labor than was required for growing cotton. Few peanuts in Southwestern Oklahoma were stacked around poles. This report also shows that peanuts produced and sold at oil prices in 1942 were not profitable to farmers in eastern or southwestern Oklahoma.

15

Present prices are the same for peanuts sold for oil and for those which are sold to the edible market, due to government-supported prices.

Peanuts are a surer crop than cotton. So far, no serious insect or disease damage to the plant has developed in Oklahoma and this is an important point with farmers after their experience with the boll weevil. However, leaf damage is common in some of the states in the Old South where peanuts have been raised for many years. Hail does little damage to peanuts but great damage to cotton. When cotton is ready to pick heavy rainstorms may be very destructive. When peanuts are ready to harvest they must have

15.

Desmond L. W. Anker and Melvin S. Slusher, Peanut Production Costs and Income in Oklahoma in 1942, Experiment Station Bulletin No. E-267, Oklahoma Agricultural Experiment Station, Oklahoma A. & M. College, Stillwater, Oklahoma, May, 1943, pp. 1-12.

attention or they will start to grow, but if the weather is too bad much of the crop can be salvaged by "hogging-off". The picking of cotton extends over a considerable period of time. Cotton growing is a family job and often the children do not get into school until after Christmas. The modern farmer prefers peanuts, for, while the work may be hard and dirty for a short period, he gets the work done and can keep his family in school.¹⁶

III. Increasing the Yield of Peanuts

There is room for much improvement in increasing the yield of peanuts in Oklahoma. The most obvious way of expanding the farmer's profit is to increase the yield per acre. In one stroke this decreases his unit cost of production and increases his gross income. The average yield of peanuts in Oklahoma since 1919 is only 550 pounds per acre, (see Table page 52). The average yield per acre in the Georgia-Alabama-Florida producing section is between 600 and 700 pounds, while in the Virginia-North Carolina region it is about 1000 pounds per acre. These averages are far below what is possible. Many individual fields are known to yield well over a ton per acre, indicating a possibility for improvement. It is felt that the production of peanuts in

16.

Robb, Op. Cit., p. 25.

Oklahoma can be greatly increased by improvement in soil
fertility and further research in plant breeding.

17

17.

C. Lewis Wrenshall, A Survey of the Research Status of the Peanut Industry, A Report to National Peanut Council Inc., Southern Research Institute, Birmingham, Alabama, p.13.

CHAPTER V

MARKETING OKLAHOMA PEANUTS

Peanuts are sometimes run through the picker the second time before going to market. This second cleaning removes more of the broken stems, light pods, roots, sand, and small stones. The extra cleaning will afford the producer a better grade for his peanuts. However, most of the Oklahoma crop goes to the market after the first picking as farmers' "stock peanuts." The bulk of the crop is sold by growers within a few months after the crop is harvested and picked. Little is left in the grower's hands after January. The usual result, before the war, was that more peanuts than the market could readily absorb were offered just after the opening of the new season, and the price declined.¹

I. Warehousing and Loans

Many growers prefer to store their peanuts in commercial warehouses, so they can obtain loans on them from the warehouse man or from a banker. In September, 1923, peanuts were named as a storable product within the meaning of the U. S. Warehouse Act, which is administered by the United

1.

Harold J. Clay, Marketing Peanuts and Peanut Products, Miscellaneous Publication No. 416, U. S. Department of Agriculture, Agricultural Marketing Service, Washington, D. C. , September, 1941. pp. 15-16.

States Department of Agriculture. The primary purpose of this act was to establish a form of warehouse receipt that would be acceptable generally as collateral for loans. Growers, merchants, cleaners, or shellers who store peanuts in warehouses under this act, are afforded security from loss, as the warehousemen are licensed by and bonded by the Government.

Under this storage practice, farmers usually receive loans of from 60 percent to 75 percent of the current price of peanuts from warehousemen or bankers and are charged an interest rate of three percent. Warehouses usually charge a small monthly storage fee plus a small fee for grading and weighing and for loading in and taking out the peanuts. By storing his peanuts the grower is able to hold them until he feels the price is sufficient for selling. Usually warehousemen sell peanuts when directed to do so by the grower and he then deducts the amount of the loan plus interest and other charges.²

During the war all of the peanut crop was purchased by agents of the Commodity Credit Corporation for disposal or use according to government directives. Prices were supported at 90 percent of parity.³

2. Clay, Op. Cit., pp. 18-19.

3. Bruce T. Robb, The Outlook For Peanut Production In Oklahoma, Federal Reserve Bank of Kansas City, Research Department, November, 1946, p. 24.

Agents of the Commodity Credit Corporation in Oklahoma are:

- (A) Southwestern Peanut Growers' Association, Gorman, Texas, sub-office, Wewoka, Oklahoma.
- (B) Crushers (oil mills) signing contracts to crush for themselves and assemble stockpile peanuts for Commodity Credit Corporation.
- (C) Shellers who sign contracts to sell and assemble stockpile peanuts for Commodity Credit Corporation.

From purchases made, the Commodity Credit Corporation made allocations between the (a) cleaners and shellers for the edible trade, and (b) crushers for oil and meal.

Warehousemen for the Southwestern Peanut Growers' Association were to be located in each community where 500 tons or more of peanuts were produced if an oil mill or sheller did not come into the area and buy for immediate crushing or shelling.

Local warehousemen receive stipulating payments for their services. These rates set by the CCC for SWPGA are:

- (a) 25 cents per ton for grading and weighing.
- (b) 75 cents per ton for labor required for loading into warehouse.
- (c) 35 cents per ton per month for storage.
- (d) 75 cents per ton for labor required in taking out of warehouse.⁴

4.

A. W. Jacobs and C. W. Van Hyning, Marketing Oklahoma Peanuts, Form No. 39-855, Cooperating Extension Work in Agriculture, Oklahoma A. & M. College and United States Department of Agriculture Cooperating, 1943.

Since 1946 the Commodity Credit Corporation made no purchases except to support prices or to provide markets. There are no longer sheller, crusher, or seed dealer's allotments or contracts, unless it becomes necessary to divert No. 2 shelled peanuts, and then a contract for crushers will be essential.⁵

Since 1946, producers may market peanuts in any given place or manner in which they choose and prices are expected to be supported at 90 percent of parity which will assure peanut growers at least \$150 per ton or \$2.25 per bushel, based on present parity, with adjustment up or down depending on type and grade.

Producers may store peanuts in any of the approved peanut warehouses and may receive loans on them according to government regulations. The following warehouses in Oklahoma were approved for storage of loan peanuts, as of September 18, 1946:

Durant Peanut Company	Durant, Oklahoma
Hudson Supply Store	Holdenville, Oklahoma
Eufaula Peanut Warehouse	Eufaula, Oklahoma
Wetumka Peanut Warehouse	Wetumka, Oklahoma
Grady Miller Peanut Warehouse	Allen, Oklahoma
George Morse Peanut Warehouse	Calvin, Oklahoma

5.

Fred E. Percy, 1946 Peanut Program, Production and Marketing Memorandum No. 46, U. S. Department of Agriculture Production and Marketing Administration, Field Branch Service, Stillwater, Oklahoma, August 20, 1946.

Byars Peanut Warehouse	Byars, Oklahoma
Stuart Peanut Warehouse	Stuart, Oklahoma
Stratford Peanut Warehouse	Stratford, Oklahoma
Shawnee Peanut Company	Shawnee, Oklahoma
Union Cotton Oil Company	Prague, Oklahoma
Binger Peanut Warehouse	Binger, Oklahoma
Southern Oklahoma Peanut Growers' Assn.	Wilson, Oklahoma
Ft. Cobb Peanut Warehouse	Ft. Cobb, Oklahoma
Konawa Peanut Company	Konawa, Oklahoma
Farmers' Cooperative Warehouse	Durant, Oklahoma
Yale Peanut Warehouse	Yale, Oklahoma
East Central Peanut Marketing and Storage Assn.	McAlester, Oklahoma
Lula Peanut Warehouse	Lula, Oklahoma
Okemah Peanut Warehouse	Okemah, Oklahoma
Mason Hatchery	Okmulgee, Oklahoma
Henryetta Peanut Warehouse	Henryetta, Oklahoma

These warehouses also serve as a local market for
⁶
 farmers' stock peanuts.

Other local markets, in connection with peanut shelling
 or crushing plants, in Oklahoma, are as follows:

Bristow Peanut Company	Bristow, Oklahoma
Swift and Company Peanut Shelling Plant	Durant, Oklahoma

⁶.

Fred E. Percy, Production and Marketing Memorandum
No. 51, U. S. Department of Agriculture Production and Mar-
 keting Administration, Field Service Branch, Stillwater,
 Oklahoma, September 25, 1946.

Woldert Peanut Producers Co.	Hugo, Oklahoma
Okmulgee Nut Company	Okmulgee, Oklahoma
Choctaw Cotton Oil Co.	McAlester, Oklahoma ⁷
Lone Star Peanut Co.	Durant, Oklahoma

Local peanut markets are likely located in other places over the state since new markets are being established continually.

II. Grading Peanuts

Peanuts are sold by weight and are graded according to damage, shrivel, and foreign material. The method of grading Spanish peanuts is determined by the U. S. Department of Agriculture and has been revised several times since they were first issued in 1924.⁸ The method for grading farmers' stock peanuts for 1946 and the price paid per ton for each grade are given on the following pages.

METHOD OF SAMPLING AND INSPECTING FARMERS' STOCK PEANUTS WHITE SPANISH TYPE UNDER THE 1946 PEANUT PROGRAM

1. Sampling Bulk Peanuts Use peanut sampling tube. The tube has a round wooden filler. Put the filler in the tube, then push the tube down through the peanuts to the bottom of the load, or as far as possible into the bulk of peanuts if stored in a bin. The tube is held in a slanting position with slots on the under side and after being pushed down as far as possible, it is given a half turn to bring the slots on the upper side. This avoids unnecessary cutting and breaking of peanuts.

7.

John Haskins (Vice President, Durant Peanut Co.).
Personal Letter to the Author, April 7, 1947.

8.

Clay, Op. Cit., p. 23.

Leave the tube in the peanuts, but pull out the wooden filler slowly, working the tube slightly back and forth so that the peanuts will run into the slots in the tube as the filler is removed. Remove the filled tube, empty into convenient receptacle, and repeat operation. Be sure to take samples from different places in the load to insure a representative sample of the lot inspected. If sampling tube is not available, dig down into the load and sample by hand.

2. Sampling Sacked Peanuts: Samples may be taken by hand or scoop. In cases of lots of fifty sacks or more, samples should be taken from approximately 10 percent of the sacks to be inspected. In cases of lots less than fifty sacks, samples should be taken from enough sacks to insure a representative sample of the lots inspected. In any event, care should be used to be sure a representative sample is drawn. Vary the portion of the sack from which the sample is drawn alternating top, bottom, middle or side of different sacks. Be sure to take an equal amount from each sack sampled.

3. Mix the sample thoroughly, spread out in thin layer and divide into equal quarters being careful to see that any loose shelled kernels, dirt and foreign material present are fairly evenly distributed.

4. Discard two opposite quarters. Mix the two remaining quarters. Repeat the quartering, discarding, and remixing operation until only about one pound is left.

5. Weigh eight ounces or one pound, (depending on size of lot) on the percentage scale. The eight ounces or one pound, including foreign material and loose shelled kernels, will be the full sample or 100 percent. Do not lose any peanuts or add any to this sample.

6. Screen and sort the sample to remove the dirt and other foreign material: stems, sticks, stones, sand, loose hulls, etc. Weigh, showing percentage in sample.

7. Weigh out exactly four ounces of the cleaned peanuts, being careful that a proportionate number of loose shelled kernels are included. This portion of the sample will be used to determine the "sound mature kernel content."

8. Shell the four-ounce sample by hand. Place all of the kernels, including any loose shelled kernels present in the sample, on a screen having round openings 16/64 inches in diameter.

9. Shake the screen vigorously from side to side until the small peanuts have had an opportunity to drop through. (All peanuts passing through are weighed and the percentage recorded as small shriveled kernels.) The small peanuts passing through the screen are automatically excluded from the "sound mature kernels" classification for White Spanish type peanuts under this program by the definition in the 1946 CCC Peanut Program contracts.

10. From the kernels riding the screen, pick out, weigh and record percentage of damaged peanuts.

"Damaged kernels" are:

- (a) Kernels which are rancid or decayed.
- (b) Moldy kernels.
- (c) Kernels showing sprouts over 1/8 inch long. However, all sprouted kernels, the separated halves of which show decay, shall be classed as damaged.
- (d) Dirty kernels where the surface is distinctly dirty and the dirt ground in.
- (e) Wormy or worm-injured kernels.
- (f) Kernels which show a yellow discoloration when the skin is removed.
- (g) Kernels having skins which show dark brown discoloration, usually netted and irregular and affecting more than 25 percent of the skin. Kernels having skins which are paler or darker in color than is usually characteristic of the variety, but which are not actually discolored shall not be classed as damaged.

11. Weigh the "sound mature kernels" which are those riding the screen with the damaged kernels removed. Record the percentage.

12. The remainder of the unused sample shall be retained by the purchaser for a period of 30 days, or for a shorter period as may be designated by the CCC's field representative. It should be marked with the grower's name and address, date and place of inspection, together with a copy of the original certificate.⁹

9.

W. T. Parker, Method of Sampling and Inspecting Farmers' Stock Peanuts White Spanish Type Under the 1946 Peanut Program, CCC Peanut Form-413, U. S. Department of Agriculture Production and Marketing Administration, Fats and Oils Branch, Peanut Division, 1946.

Note: The term "loose shelled kernels" used herein shall mean whole, split, and broken shelled kernels in the samples.

TABLE IV
PRICE LIST OF PEANUTS
SPANISH AND VALENCIA WEST OF MISSISSIPPI
1946 CROP

Per Cent Sound Mature Kernels	Peanuts Containing Less Than 3% Damage	Peanuts Contain- ing 3% Damage	Peanuts Contain- ing 4% Damage	Peanuts Contain- ing 5% Damage	Peanuts Contain- ing 6% Damage
80	\$197.00	\$194.60	\$192.20	\$189.80	\$187.40
79	194.50	192.10	189.70	187.30	184.90
78	192.00	189.60	187.20	184.80	182.40
77	189.50	187.10	184.70	182.30	179.90
76	187.00	184.60	182.20	179.80	177.40
75	184.50	182.10	179.70	177.30	174.90
74	182.00	179.60	177.20	174.80	172.40
73	179.50	177.10	174.70	172.30	169.90
72	177.00	174.60	172.20	169.80	167.40
71	174.50	172.10	169.70	167.30	164.90
70	172.00	169.60	167.20	164.80	162.40
69	169.50	167.10	164.70	162.30	159.90
68	167.00	164.60	162.20	159.80	157.40
67	164.50	162.10	159.70	157.30	154.90
66	162.00	159.60	157.20	154.80	152.40
65	159.50	157.10	154.70	152.30	149.90
64	157.00	154.60	152.20	149.80	147.40
63	154.50	152.10	149.70	147.30	144.90
62	152.00	149.60	147.20	144.80	142.40
61	149.50	147.10	144.70	142.30	139.90
60	147.00	144.60	142.20	139.80	137.40
59	144.50	142.10	139.70	137.30	134.90
58	142.00	139.60	137.20	134.80	132.40
57	139.50	137.10	134.70	132.30	129.90
56	137.00	134.60	132.20	129.80	127.40
55	134.50	132.10	129.70	127.30	124.90
54	132.00	129.60	127.20	124.80	122.40
53	129.50	127.10	124.70	122.30	119.90
52	127.00	124.60	122.20	119.80	117.40
51	124.50	122.10	119.70	117.30	114.90
50	122.00	119.60	117.20	114.80	112.40
49	119.50	117.10	114.70	112.30	109.90
48	117.00	114.60	112.20	109.80	107.40

Deduct from the above prices 10¢ per ton for each full 1% foreign material in excess of 5%.

IMPORTANT:

All types of peanuts containing 7% or more damage will be purchased on the basis of total kernel content at \$1.70 per ton for each full 1% total kernel content.

EXAMPLE:

Peanuts grading as follows: (Taken from Inspection Memorandum, CCC Peanut Form 416)

Sound Mature Kernels	70%
Small Shriveled Kernels	2%
Total Damage	8%
<hr/>	
Total Kernel Content	80%

In other words, total kernel content is the total percentages of sound mature kernels, small shriveled kernels, and total damage as taken from Inspection Memorandums.

The total kernels content is then multiplied by \$1.70 as stated above.

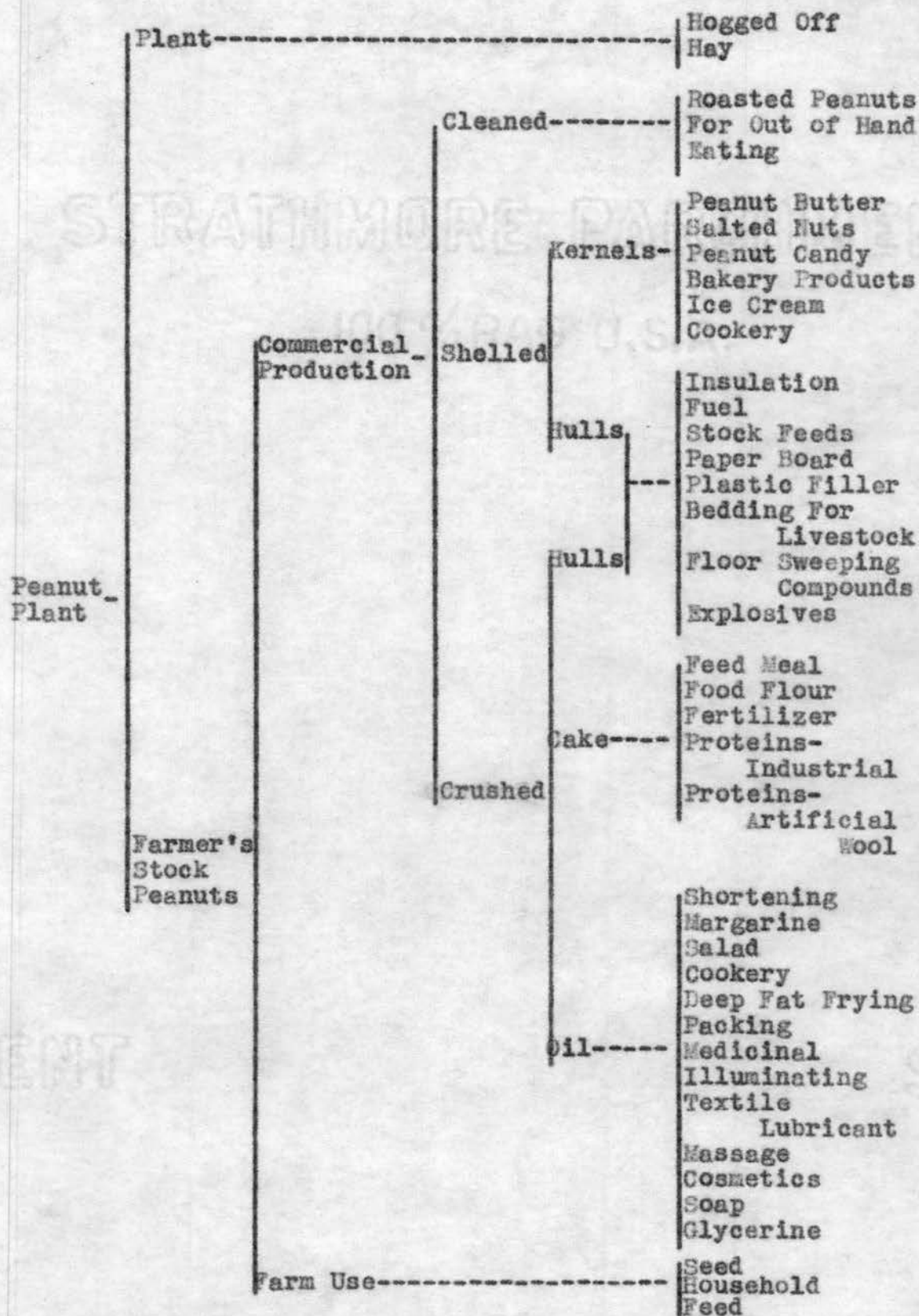
80% total kernel content X \$1.70 equals to \$136.00 per ton, price to seller.

Should the peanuts have excess foreign material, the deductions will be made as in figuring prices for peanuts with damage less than 7%.¹⁰

10.

This is an exact copy of the form furnished by Ralph McMillen, manager of the Bristow Peanut Company, Bristow, Oklahoma. This is the method used by the Bristow Company for grading and buying farmers' stock peanuts, and is in conformity with specifications for grading and buying, as set by the United States Department of Agriculture Production and Marketing Administration.

TABLE V
USES OF PEANUTS AND PEANUT PRODUCTS



Peanuts -- Their Food Values and Interesting Recipes, The National Peanut Council, Inc. Atlanta, Georgia, 1941, p. 2.

CHAPTER VI

PROCESSING AND USES OF PEANUTS

The American peanut industry is primarily a food industry concerned with the production, processing, and marketing of peanuts as human food. Other uses for peanuts are less important to the industry,¹ although, many of them are discussed in this chapter. The table on page 76 illustrates the many uses for peanuts.

Since only the Spanish type peanut is grown for the commercial market in Oklahoma, this will be the only type discussed here.

I. Primary Processing

On leaving possession of the grower, farmer's stock peanuts enter the warehouse, and silos of the shelling, crushing, storing, and distributing agencies. They are bought according to grade, although usually without benefit of accurate moisture determination, and the grade largely determines the processing to which they will be subjected. If they yield, or can be blended to yield, a sufficiently

1.

Lewis C. Wrenshall, A Survey of the Research Status of the Peanut Industry, A Report to National Peanut Council, Inc., Southern Research Institute, Birmingham, Alabama, February 1, 1946, p. 33.

high proportion of sound kernels they may be cleaned, shelled, and sorted to produce shelled stock for the food trade. If the proportion of kernels unacceptable for food use is so high as to make it uneconomical to produce shelled nuts, the stock is simply shelled and crushed for oil and² meal.

After the peanuts for food purposes have been well cleaned and shelled, the kernels are carried on belts to a separator consisting of a series of perforated screens so adjusted in size that peanuts of No. 2 grade and broken pieces of nuts fall through the screen as the nuts of No. 1 grade tail over them. The occasional uncracked pods are carried on a belt back to the sheller; and No. 3 peanuts (small kernels or pieces of peanuts unsuited for the No. 2 grade) fall into a bag for crushing later. No. 1 and No. 2 peanuts get additional cleaning by the use of oscillating screens and air currents, which blow away the trash as the peanuts move along.

From the screens separate belt conveyors carry the No. 1 and No. 2 size kernels to the picking tables, where undesirable nuts are removed by workers and placed with the oil stock. Then the nuts tail over the end of the belt into chutes that carry them to the floor below where they are bagged.

2.

Ibid., pp. 19-20.

Oil stock in Oklahoma consists mostly of screenings and pick-outs, and is often called "mill stock." During recent years much farmers' stock has been crushed straight, including No. 1 grade nuts.³

II. Peanuts Used on the Farm

Many acres of peanuts are used on Oklahoma farms each year. These peanuts are harvested in the usual manner and part of the nuts and vines are fed to the farm livestock. The rest of the nuts are hand picked from the vines and are stored for roasting and cookery purposes. Most farm families save a few sacks of the commercially picked peanuts for use in the home. Peanut vines for hay is discussed in a previous chapter. Most peanuts remaining on the farm are for "hogging" purposes.

Hogging Peanuts

Peanuts harvested by hogging down methods are a soil improving crop providing the physical condition of the soil is not injured by letting the hogs root when the soil is too wet. Labor problems at harvest time can be solved by hogging the extra acres of peanuts. Hogs should be turned on peanuts when they are ready to harvest to get the most

3.

Harold J. Clay, Marketing Peanuts and Peanut Products Miscellaneous Publication No. 416, U. S. Department of Agriculture, Agriculture Marketing Service, Washington, D. C., September, 1941, p. 37.

benefit for the hogs, but if harvest for market is delayed until peanuts have sprouted the crop can be salvaged by "hogging off" at a later date.

Two acres yielding 1,000 pounds of peanuts will produce about 350 pounds of pork when "hogged" in the fall and about 275 to 325 pounds if "hogged" in December and January.⁴ About 1,000,000 acres of peanuts are "hogged off" each year in the United States.⁵

III. Peanut Foods

George Washington Carver has often stated,

that if all vegetable foodstuffs were destroyed except these two strictly Southern products, the peanut and the sweet potato, we could live on them alone and be perfectly hearty, and we would still have a perfectly balanced ration for man and his animals--starch and sugar from the sweet potato and protein from the peanut -- and both could be prepared in so many different ways that 'the palate will not tire nor the digestion suffer from a monotonous sameness.'⁶

The demand of war for more and more food of a highly concentrated nature has brought peanuts to the fore as a compact source of energy-producing nutriment. Peanuts are

4.

E. R. Collins, L. L. McLendon and others. Producing Peanuts For Oil, War Series Bulletin No. 17, North Carolina State College of Agriculture and Engineering of the University of North Carolina and U. S. Department of Agriculture, Cooperating, North Carolina Agriculture Extension Service, State College Station, Raleigh, North Carolina, February, 1943, p. 13.

5.

John F. Marsh, "The Increasing Importance of the Peanut." The Agriculture Situation, Volume 29, No. 7, Washington, D. C., July, 1945, pp. 18-22.

6.

Rackam Holt, George Washington Carver, An American Biography, Doubleday Doran and Co., Inc., Garden City, N.Y., 1943, pp. 240-241.

7
 recognized by the armed forces as a first class army ration
 and during the war the armed services absorbed approximately
 8
 50 percent of our entire peanut crop.

In recent years about 72 percent of the peanut crop has
 gone into the so-called "edible" trade, leaving only 28 per-
 9
 cent to be crushed for oil. Of the amount of oil produced
 10
 approximately 90 percent goes into edible products.

Nutritional Composition of Peanuts

The edible portion of the peanut contains major propor-
 tions of the three primary dietary necessities: Protein 26
 to 27 percent, carbohydrates 17 to 25 percent, and fat 45 to
 50 percent. Raw peanuts contain from four to five percent
 of moisture, which is reduced during roasting to about half
 11
 this amount. Because of its relatively low moisture con-
 tent and high fat content it is one of the most concentrated
 food products, one gram supply 5.8 calories. (Compare with

7.

Roy E. Parrish, "Peanuts -- After the War." Annual Report of National Peanut Council, Inc., Atlanta, Georgia, 1944, p. 24.

8.

Walter A. Richards, (President, National Peanut Council) "Peanut Industry Needs United Effort to Preserve Wartime Gains." Annual Report of National Peanut Council, Inc., Atlanta, Georgia, 1945, p. 3.

9.

Walter A. Richards, (President, National Peanut Council) "The Outlook of the Peanut Industry." Southwestern Peanut Growers News, Vol. 5, No. 4, Gorman, Texas, May, 1945, p. 3.

10.

C. Lewis Wrenshall, A Survey of the Research Status of the Peanut Industry, A Report to the National Peanut Council, Inc., Southern Research Institute, Birmingham, Alabama, February 1, 1946. p. 33.

11.

Lela E. Booher (Chief Nutritionist, General Mills, Inc., Minneapolis, Minn.) "The Nutritive Value of Peanuts." Peanuts Their Food Values and Interesting Recipes, National Peanut Council, Inc., Atlanta, Georgia, 1941, p. 6.

beefsteak 2.3 calories, whole wheat 3.6 calories, white bread 2.6 calories, pure cane sugar 4 calories.) In addition, it contains significant amounts of other substances of dietary importance including vitamins and minerals.

(The fat contained in peanuts is nutritionally of high value. It contains an ample proportion (20 to 25 percent) of linoleic acid, which is regarded as a dietary essential. It is almost completely digestible and, excluding vitamin values, has been shown repeatedly to be nutritionally the equal of butter-fat.

The biological value of total peanut protein has been shown to be among the highest of the vegetable proteins, and almost equivalent to that of casein from cows milk. Moreover, the amino acid composition of peanut protein is such as to make it particularly well suited to supplement the deficiencies of cereal proteins. Peanut protein is highly digestible, either raw or cooked. The quality of peanut protein thus places peanuts far above most other vegetable foods in nutritive value.¹² It should be noted, however, that they are not considered to be so easily digestible as meat, nor is their protein of as high biologic value as that of meat and eggs. Although peanuts cannot replace meat, they can serve well as a meat extender.¹³

12.

Wrenshall, Op. Cit., A Survey of the Research Status of the Peanut Industry, pp. 23-24.

13.

"Peanuts They Are Legumes." Consumers Research Bulletin, Vol. 11, March, 1943, pp. 5-7.

The carbohydrate content of peanuts is relatively low, averaging about 20 percent. This is made up of a number of substances including starch and sucrose (cane sugar), which are digestible. Pectin and cellulose, which are probably of no value nutritionally, are also present. Peanut foods are sometimes prescribed for diabetic patients, because of their low content of digestible carbohydrates.

Peanuts are an excellent natural source of some of the vitamins required in human nutrition. In particular, thiamin, riboflavin and nicotinic acid are present in important amounts. The skin is especially rich in thiamin. Other members of the B complex, including pyridoxin and pantothenic acid, are known to be present in peanuts. Peanuts are almost devoid of vitamins A, C, and D. They are, however, an excellent source of vitamin E, since peanut oil contains appreciable quantities of substances (tocophorals) that exhibit vitamin E activity.

As to minerals, peanuts contain phosphorus, calcium, and iron in amounts that are nutritionally significant. From a quantitative standpoint they appear to be a rich source of phosphorus. However, a large part of the phosphorus is in the form of phytin, the nutritive value of which is questionable. The nutritional availability of the calcium and iron present does not appear to have been established. The presence of traces of a number of mineral elements, including copper, baron, manganese, and zinc, has been detected spectroscopically.

Other substances of nutritional importance which have been shown to be present to an important degree in peanuts are choline and the phosphatides, lecithin and cephalin. It is evident that a considerable amount of research work has been done to determine the nutritive value of peanuts. It is true that the high nutritive level of peanut foods is well established.¹⁴

Peanut Butter

Peanut butter is the most important single food product manufactured from peanuts at present, accounting for approximately half of the peanuts consumed as food.¹⁵ The nuts are first roasted then blanched to remove the skins. The hearts, which have a slightly bitter taste, are also removed by most manufacturers. The nut kernels are then ground, salt added and the resulting mass packed directly into containers. Peanut butter is usually made by blending two portions of Spanish or runner peanuts with one portion of Virginia peanuts to secure the most desireable consistency.¹⁶

14. Wrenshall, Op. Cit., A Survey of the Research Status of the Peanut Industry, pp. 24-25.

15. Ibid., p. 29.

16. J. G. Woodroof, Helen H. Thompson, and S. R. Cecil, Improving the Quality of Peanut Butter, Bulletin 243, Georgia Experiment Station of the University of Georgia, October, 1945, p. 1.

The average use of peanut butter is about three pounds per person per year. This is very small in comparison with similar quality foods. Greater consumption is anticipated through additional uses, low cost, and availability of more
17
and better grade peanuts.

Much research has been carried on with a view to improving peanut butter. The principal objectives have been to prevent oil separation, to overcome the characteristic "clogging" in the mouth, and to retard staleness or rancidity. The patents issued show a number of ways in which improvements have been made; however, in spite of the considerable amount of activity thus evidenced, most of the peanut butter on the market exhibits in some degree the faults that these inventions are intended to overcome. It is therefore, doubtful if any wholly satisfactory solutions have been found, and current research programs are known to be still working toward overcoming these faults of peanut butter. Nevertheless, great improvement has been made in this valuable food product and further research will no doubt enable manufacturers to serve a still better product to the consumer.
18

17.

Modine Muchbanks, (Home Economist, National Peanut Council.) "Let's Be Practical With Peanut Products." Peanuts Their Food Values and Interesting Recipes, National Peanut Council, Inc., Atlanta, Georgia, 1941, pp. 29-31.

18.

Wrenshall, Op. Cit., A Survey of the Research Status of the Peanut Industry, pp. 29-30.

Salted and Confection Peanut Uses

Approximately one-third of the shell peanut production appears on the market as salted peanuts. Preparation involves cooking in peanut oil and salting. Coconut or bassu oil were used in this process before the war. Spanish peanuts are usually salted without removal of the skins, others are blanched.

Some 20 percent of the shelled peanut production is shipped to Chicago and the Northeast where it is used by candy and other confectionery manufacturers.¹⁹ Great improvements are continually being made in confection products through moisture control and improved blending of ingredients.²⁰

Peanut Oil

Before 1940, less than 10 percent of the peanut crop was crushed for oil. In 1940-41, under the stimulus of the government-sponsored diversion program, 35 percent of the crop was crushed and that amount has not been exceeded in recent crop years.²¹ Approximately 90 percent of American peanut oil production goes into edible products, vegetable shortening and oleomargarine accounting for most of it.

19.

Marsh, Op. Cit., pp. 18-22.

20.

J. G. Woodroof, S. R. Cecil and Helen H. Thompson, The Effect of Moisture on Peanuts and Peanut Products, Bulletin No. 241, Georgia Experiment Station of the University System of Georgia, May, 1945, pp. 1-23.

21.

C. L. Wrenshall, Industrial Uses For Peanuts and Peanut Products, Chemurgic Reprint Series No. 45, Southern Research Institute, Birmingham, Alabama, May 15, 1946, p.1.

Perhaps the least developed of all existing peanut food products is peanut oil. In addition to its valuable nutritive characteristics, already mentioned, it has the virtue of being an excellent cooking and salad oil for general use. It is readily refined and has excellent keeping qualities. It has the highest smoke point, the least tendency to absorb or impart flavors, and the lowest cooking loss of any oil available for culinary purposes.²²

The shelf-life of peanut oil has been greatly extended by addition of one tenth of one percent lecithin to the oil to retard rancidity. By the addition of one or two percent oat flour or the equivalent of oat extract, peanut oil can be kept one or two years, respectively. The use of refrigeration where it is possible will accomplish the best results and should be used as much as possible under all conditions.²³

Peanut oil has the disadvantage of becoming cloudy and eventually semi-solid on exposure to refrigerator temperature. This property has practically excluded it from use in the commercial manufacture of food emulsions such as mayonnaise, which must be perfectly stable in refrigerator storage. The Southern Regional Research Laboratory has

22.

Wrenshall, Op. Cit., A Survey of the Research Status of the Peanut Industry, pp. 30-31.

23.

J. G. Woodroof, Helen H. Thompson, and S. R. Cecil, Peanut Oil, Bulletin No. 240, Georgia Experiment Station of the University System of Georgia, July, 1946, pp. 23-24.

developed a process of solvent winterization whereby 80 percent of the original peanut oil can be recovered as a product entirely suitable for the manufacture of mayonnaise and salad dressing or for general table use. This process is highly significant as it opens up a new industrial field which annually consumes over 200 million pounds of oil.

In view of its known values and the possibilities opened up by solvent winterization there seems to be a chance for peanut oil to compete successfully in the field of select cooking and salad oils. The development of this possibility in conjunction with the manufacture of peanut flour is perhaps the greatest single opportunity that exists²⁴ for the expansion of the peanut industry in the food field.

All No. 2 grade peanuts were required to be crushed for oil in 1944. This served the purpose of assuring the much needed oil supply and also assured the public that food products were made from No. 1 peanuts. If this practice continues the use of only No. 1 grade peanuts will greatly improve the quality of peanut food products, furnish a good quality oil for oil food products, and make available a greater supply of low grade oil from No. 3 grade peanuts for²⁵ industrial purposes.

24. Wrenshall, Op. Cit., A Survey of the Research Status of the Peanut Industry, p. 31.

25. Marsh, Op. Cit., pp. 18-22.

As a general food oil, peanut oil will meet with competition from cottonseed, corn, soy, and other food oils. The determining factor in this competition will be economic rather than preferential as the oils vary little when used²⁶ in the manufacture of most foods.

New Peanut Foods

The most obvious possibilities of expanding the market for peanuts lie in the food field, through the improvement of existing food products and the introduction of new foods made from peanuts or containing substantial proportions of peanuts.

A potentially important peanut food that has already been developed but not yet widely exploited is peanut flour. This product is a highly concentrated source of protein and vitamins that should play a natural part in any program to improve the health of the nation through better nutrition. It is ideally suited to supplement cereal flours. It is also a practical intermediate product for use in the manufacture of soups, meat substitutes and extenders, infant foods, and other specialty food products. The production of peanut flour would provide an ideal accompaniment for a program to extend peanut oil consumption and these two programs²⁷ should be considered together. In 1944 only one mill was

²⁶.

Wrenshall, Op. Cit., Industrial Uses For Peanuts and Peanut Products, p. 2.

²⁷.

Wrenshall, Op. Cit., A Survey of the Research Status of the Peanut Industry, pp. 31-32.

making peanut flour and it was having trouble meeting the
²⁸
 demand.

Many new foods from peanuts have been developed in recent years. Most of these were made by modifying peanut butter in form and flavor by the introduction of other food products and flavoring substances. George Washington Carver presented 105 ways of preparing peanuts for human consumption.
²⁹ In this connection, it is well to realize that the possibilities have already been explored. A survey of the patent literature reveals that proposed additions to ground peanuts include: water, a variety of fruits, various cereal products, cheese, eggs, cocoa, condiments, sugar, honey, olives, malt extract, syrup, bran, milk, sweetened condensed milk, egg yolk, edible oil, edible acid, dextrose, yeast, vanilla and similar flavoring extracts, chocolate, milk powder, arrowroot starch, starch jelly, and, vegetable gums. Doubtless, many other possible combinations have been tried that never reached the patent stage. It is evident, therefore, that practical results are not likely to be attained by simple kitchen experimentation, but that detailed study by competent technologists will be required to produce results.

28.

"The Peanut Opens Industrial Vistas." Manufacturers Record, Vol. 113, June, 1944, pp. 38-41.

29.

George W. Carver, How to Grow the Peanut and 105 Ways of Preparing It For Human Consumption, Bulletin No. 31, Experiment Station Tuskegee Institute, Alabama, June, 1925, Eighth Edition January, 1942, pp. 8-30.

A recent program at the Georgia Experiment Station has given systematic consideration to the modification of peanut butter, as to taste, consistency, and stability, by the incorporation of other food products. Many combinations were studied, some of which appear to have considerable promise, requiring only a little further development to put them on a production basis. Other laboratories, including those of canning concerns, are also known to be conducting development work on peanut foods. Canned vegetable combinations, meat substitutes, cheese imitations and breakfast foods are among the products that have been suggested as possibilities. Products such as these obviously result from more complicated manufacturing processes than peanut butter combinations and require correspondingly more elaborate technical development.³⁰

IV. Industrial Uses

Strictly industrial outlets for peanuts have never attained importance. The materials produced which are not suitable for human food can be regarded as by-products of the peanut industry and as such, go into industrial uses. These include the shells, skins, and hearts that are separated in processing, inedible grades of peanut oil, press cake, and inedible grades of peanuts. For the most part they

30.

Wrenshall, Op. Cit., A Survey of the Research Status of The Peanut Industry, p. 32.

enter relatively low class uses such as feed, fuel, and soap stock. Many attempts have been made to develop additional uses of these products.

In thinking of industrial uses for peanuts, crushing for oil and meal immediately comes to mind. From time to time in the past crushing has served the peanut industry as if it were a purely industrial outlet, having the effect of removing surplus peanuts from the food market. Actually, peanut oil is largely consumed in the manufacture of food products and the meal is a nutritious protein concentrate used as an ingredient of livestock feed. Although they already serve these important uses, peanut oil and meal are logical materials to consider for possible industrial development.

Peanut hulls constitute the most important by-product of peanuts, being produced in large quantities at both shelling and crushing establishments. Peanut skins are produced in significant amounts in all processes that involve blanching, such as the manufacture of peanut butter, salted peanuts, and peanut candy. Peanut hearts (or germs) are separated from the blanched halves in peanut butter manufacture and to some extent in other processes.

The accumulation of peanut hulls at specific locations appear to favor industrial use. However, it is considered unlikely that the amount produced at any one plant is sufficient to make processing profitable. Therefore, in looking toward industrial utilization the cost of transportation to

centrally located plants should be taken into consideration.

It is difficult to make an estimate of the production of hearts and skins. Peanut butter manufacture is the principal source of these products. On the assumption that hearts and skins each constitute about three percent of the weight of the shelled stock processed, peanut butter manufacture would yield 12 to 15 million pounds of each. However, this production is more widely spread throughout the country than that of peanut hulls, making industrial utilization of these by-products even more difficult.

The possibilities of processing whole peanut kernels for industrial uses should not be overlooked. Many of the studies looking toward industrialization are based on whole kernels. A system can be contemplated under which the choicest nuts would be separated from the shelled stock for food use leaving a substantial output available for industrial processing. As an alternative to the conventional crushing practice, these industrial grade nuts might be processed by solvent extraction or other procedures not commonly used in this country to yield products more desirable from the standpoint of the industrial user.³¹

31.

Wrenshall, Op. Cit., Industrial Uses For Peanuts and Peanut Products, p. 2.

Peanut Oil

In America peanut oil is made by crushing the kernels, skins, and hearts in a hydraulic press. This process leaves from five to nine percent of the oil in the cake whereas this percent can be reduced to four or five percent if a modern expeller press is used. In addition, it is possible by solvent extraction to decrease the oil in the meal to one percent. Although technical problems of this last method have not yet been solved as far as the oil is concerned, the meal produced thereby is superior, for the protein it contains has not been denatured by heat.

Through a combination of hydrogenation and winterizing, peanut oil has been proven to be definitely superior to olive oil as a textile lubricant. Additional experimentation has developed from low grade peanut oil, a product excellent for sulfonation, thereby again supplanting olive oil.

Peanut oil is also used in soaps, shaving creams, cosmetics and pharmaceuticals. Recently it has been used to an advantage as a massage oil, especially for infantile paralysis sufferers and as a carrier of adrenalin and penicillin. The oil has successfully found such industrial uses as a constituent of boring compounds, oil sprays, and as an agent for leather impregnation.

Peanut oil has shown superiority in certain experimental insecticidal applications. Crude peanut, cottonseed, and

corn oils were found to be equal or superior to petroleum oil in the control of Mexican mealy-bugs, while the refined oils were less effective. The addition of two percent of peanut oil increased the effectiveness of derris-talc mixtures against pea aphids. The toxicity to the squash bug of derris, nicotine and other insectides was markedly increased by the use of peanut oil. Sprays containing one percent oil were not injurious to the squash plants. These findings indicate the possibility that peanut oil might find significant use in the field of insecticides.³²

Peanut Meal

Possible industrial uses for peanut protein as contained in the meal appear to be important. Practical peanut protein preparations are obtained by separating and drying the curdy precipitate that forms on acidifying the alkaline extract, for example by introducing sulfur dioxide. Less drying is required if the curds are dewatered by warming to 50 degrees centigrade before the liquid is removed. The dry product can be readily dissolved in water if the acidity in the curds is neutralized with alkali before drying.

Present indications are that industrial requirements will be met best by undenatured meal produced by solvent extraction, or by press cake meal that has been subjected to

32.

Ibid., p. 3.

the least possible heat. Research indicates that such products as textile fibers, artificial bristles, adhesive, coatings, plastics, amino acids, and other protein derivatives can be made from peanut meal.

A potentially important application of peanut protein is the manufacture of textile fibers. This process involves extruding a viscous alkaline dispersion of the protein through a rayon-type spinneret into an acid coagulating bath which may also contain other substances. The yarn formed by coagulation is treated with formaldehyde to harden the protein and subjected to stretching action which is believed to induce alignment of the molecules. The viscosity of the original protein dispersion has an important influence on the properties of the yarn produced. In common with other protein fibers, such as those made from casein and soy protein, peanut protein fiber has the deficit of low strength when wet. It is somewhat wool-like in character and, in its present state of development, can be regarded as suitable for admixture with rayon, cotton, or wool. Workers at the Eastern Regional Laboratory report that globular proteins, including peanut protein, can be converted into fibrous forms with greatly increased filament strength by means of heat and mechanical treatment. Artificial bristles have been prepared from various proteins at the same laboratory. ³³

Considerable success has attended the development of adhesives from peanut proteins and meals, especially of the tacky and re-wettable types. The market for re-wettable glues is enormous. This is attested by the fact that one plant which carried out tests with products made at a Southern Laboratory, produces seven car-loads of gummed tape a day. Several experimental batches of peanut protein glues have recently been used in the manufacture of gummed tape under normal operating conditions in one of the largest gummed tape

33.

Ibid., p. 4.

plants in the United States. These glues compared favorably with animal glues and for certain special purposes are superior. Batches of peanut glues give high adhesive test values. Particular advantages of gummed tape glues prepared from peanut protein are: Light color, especially when applied to white paper; less hygroscopic (moisture retaining) than animal glue; more sanitary than animal glue which is prepared from non-edible packing house wastes. Other experimentation with peanut proteins has produced wood glues that³⁴ are equal to present available glues.

The preparation from peanut meal give rise to by-products, the disposal of which would affect the economy of the operation. These by-products are the residual meal and liquid drained from the precipitated protein. Preliminary work at the Southern Regional Research Laboratory and elsewhere indicates that the meal residue can probably be used in stock feeds. Indications have also been obtained that the liquid can serve as a medium for the culture of yeast thus³⁵ producing additional material of high feeding value.

Peanut oil residue, or press cake meal, contains from 40 to 50 percent protein and serves as an excellent feed for all livestock. Experiments show that peanut meal gives excellent results in milk production when fed to dairy cows.

34. "The Peanut Opens Industrial Vistas," Op. Cit., pp. 38-41.

35. Wrenshall, Op. Cit., Industrial Uses For Peanuts and Peanut Products, pp. 5-6.

Best results are obtained when a mixture of peanut meal and cottonseed meal is fed. Excellent results are given when a similar mixture is fed to beef cattle, swine and sheep.

Experiments in Oklahoma and elsewhere prove that peanut meal can successfully replace a greater part of the higher priced animal protein in poultry feed.³⁶

Peanut Hulls

The principal use of peanut hulls at present is fuel for the processing plant boilers and as such they have a value of from three to four dollars a ton. The hulls are also used to dilute peanut meal when a lower protein content is desired, as poultry litter, livestock bedding, in bran for mixing with feeds, as fertilizers, as mulch, and as a soil conditioner.

A cork substitute called Norseal made from peanut hulls³⁷ will, in all probability, be on the market soon.

36.

F. R. Edwards and Z. A. Massey, Peanut Meal In Livestock Production, Bulletin No. 216, Georgia Experiment Station of the University System of Georgia, June, 1941, pp. 2-14.

37.

Wrenshall, Op. Cit., Industrial Uses For Peanuts and Peanut Products, p. 5.

Wheeler McMillen. New Riches from the Soil, the Progress of Chemurgy. New York: D. Nostrand Company, Inc., p. 317.

CHAPTER VII

THE OUTLOOK FOR THE PEANUT INDUSTRY IN OKLAHOMA

Many people are of the opinion that the peanut industry in Oklahoma is only temporary. They feel that as soon as government supported prices for the crop are no longer forthcoming, the industry will be on its way out. Farmers, themselves, do not expect present prices to hold, and most of them agree that peanut acreages will be somewhat reduced. Whatever may be the truth regarding this matter, there can be little doubt that the price the farmer will receive is the most important single factor determining future production.

Depending on grade, the average price the farmer received for the 1945 crop was about \$160 a ton, or eight cents a pound. Reference to the table on page 52 will show that this was less than the price in 1919 and compares with about five cents in the decade of the Twenties. It is somewhat more than double the price obtained immediately before the war. In contrast with the price of peanuts, present prices of cotton, wheat, and corn are about three times those of 1939. The Department of Agriculture has established a parity price of 9.55 cents for the 1946 peanut crop and will support the market at 90 percent of this parity price. It is not to be expected that these prices for peanuts will continue indefinitely. If peanut prices fall,

however, cotton, wheat, and corn prices are almost sure to fall. The question, then, is not what will happen when peanut prices fall, but how peanut prices will compare with those of other crops to which the farmer might turn.

Bankers, county agents, soil conservation people, and farmers over the state of Oklahoma were questioned concerning the future of the peanut industry and almost invariably they were of the opinion that peanut production will be decreased little, if post-war prices of cotton and wheat were reduced in comparison to peanut prices.

Farmers who have been growing peanuts for many years before the war were of the opinion that more money can be made by growing peanuts at 50 cents a bushel than with cotton at 10 cents a pound. The newer farmers, interviewed, were somewhat less certain about the future of peanut growing.¹

One writer points out that fifty concerns built new or enlarged peanut processing plants in the peanut growing area in 1945. These firms thought peanuts had a promising future beyond the current war period. Such plants cannot be paid for with the profits of one or two years operation. This writer also points to the 100 percent increase in sales of peanut butter in A. & P. stores during the ten-year period following 1930, and the still more sensational increase in the sales of peanut candy products, which shot upward 1800

1.

Bruce T. Robb, The Outlook For Peanut Production In Oklahoma, Federal Reserve Bank of Kansas City, Research Department, November, 1946, pp. 24-30.

percent. Another point this author gives in favor of a stable peanut market is the fact that, after short periods of adjustment, peanuts emerged from both the War between the States and the first World War with many new and permanent² customers.

Other writers point to the outstanding work now carried on by the National Peanut Council, and the more than \$200,000 which they spend annually toward forwarding the peanut industry by a program of research, education, publicity, advertising, and conference.³

Great emphasis is now being placed on the important work carried on by the Southern Regional Research Laboratory at New Orleans, and by various other research laboratories at State Experiment Stations, and Universities throughout the South. It is believed that new improved peanut products will afford a much wider public acceptance to their use and that improvements now being made in farm machinery will completely revolutionize the harvesting of peanuts.⁴

Growing peanuts for oil purposes, without the benefit of government supported prices, has not been very profitable

2.

Paul W. Chapman, (Dean, Georgia College of Agriculture), "Will The Boom In Peanuts Last?" Southwest Peanut Growers News, Volume V, No. 4, May, 1945, p. 1.

3.

James E. Wood, Annual Report, National Peanut Council Inc., Atlanta, Georgia, 1945-1946.

4.

Paul W. Chapman, (Dean, Georgia College of Agriculture), "Will The Boom In Peanuts Last?" Country Gentleman, March, 1945, p. 22.

to farmers in the past. Future possibilities for growing peanuts for oil may depend upon developments in the food and industrial uses for peanut oil and meal.

Peanuts used for industrial purposes have never been of much importance, but recent discoveries in this field may change this picture in the near future.

Oklahoma has a large supply of cheap sandy land often spoken of as typical peanut land. Some of this land is what is known as "blow sand" -- sand that shifts easily with the wind and contains very little organic material. While this land has been producing peanuts, most of the soil conservation authorities feel that what little organic matter it contains is being depleted rapidly. It is undoubtedly true, also, that in the urge to raise peanuts at present prices a very large part of the better land in peanuts is being exploited. Many thoughtful people are greatly disturbed regarding present soil practices and peanut production in Oklahoma.

Probably the most important difficulty is the large number of tenant farmers. The census of 1940 showed that 54 percent of farm operators in Oklahoma were tenants and it is the judgment of local people that the figure is nearer 75 percent in the areas where most of the peanuts are grown. The tenant has little interest in the land -- too many of them are here today and somewhere else tomorrow. A cover crop requires a considerable investment in the form of seed and labor. Strip farming is distasteful to many farmers,

for there are easier ways of farming. Sound soil practices are possible only with the better class of tenants, and unfortunately such tenants are in the minority.

No one seems to doubt that, with proper soil management, peanuts can be worked into a soil-building program. Farmers are learning to raise peanuts and to take care of the soil but at best it is a slow process. Obviously there is little future for peanuts in Oklahoma unless they fit into a long-range farm program. Such a program is outlined on page 28 of this thesis. Soil conservation is at the heart of this peanut question and it seems evident that the future of the peanut industry in Oklahoma will depend largely upon what is done toward maintaining soil fertility of the farm land. Continued growing of peanuts in this state without adequate care of the soil can easily do great damage.⁵

5.

Robb, Op. Cit., pp. 24-31.

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