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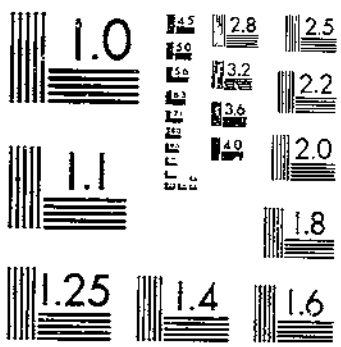

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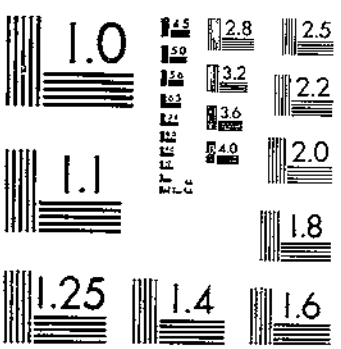

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Technical Bulletin No. 619 June 1938

UNITED STATES DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C.

SOYBEANS IN THE UNITED STATES; RECENT TRENDS AND PRESENT ECONOMIC STATUS [1]

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CONTENTS

INTRODUCTION

Acreage of soybeans for all purposes in the United States has shown a marked and fairly continuous increase during the last 10 years, and the growth in bean production has been even more rapid than the expansion of acreage. But the increase in soybean crushings, most of which has taken place within the last 3 years, has been the chief factor in attracting popular interest to the soybean and its uses. Most of the increase in production has been in Illinois and other North Central States, and soybean-processing plants are largely concentrated in this area, at present.

Manchuria is the most important soybean-producing country and the dominant factor in the world market. But with substantial duties on soybeans and soybean products imported into this country, and with domestic products entering foreign markets only in relatively small quantities, there has been little direct competition between domestic and Manchurian soybeans. Consequently, prices of soybeans in this country have largely been determined by domestic supply and demand conditions, and have not been greatly influenced by prices of Manchurian soybeans.

As a large fraction of the soybeans produced in the United States is sent to the crushing mills, prices paid to growers depend on the

[1] Received for publication November 15, 1937.

[2] Credit is due to J. E. Barr and Anne Dewees of the Bureau of Agricultural Economics, W. J. Morse of the Bureau of Plant Industry, H. T. Herrick of the Bureau of Chemistry and Soils, and O. E. May of the Regional Soybean Industrial Products Laboratory at Urbana, Ill., for helpful suggestions and criticisms.

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value, at current prices, of the oil and meal produced. Because of the relatively low average oil yield of soybeans, the value of the meal produced usually exceeds that of the oil, and changes in the price of soybean meal consequently have a little more influence on prices of soybeans than changes in the price of soybean oil. Demand for use as seed is an additional element influencing the prices of soybeans in the spring and early summer months.

Soybean oil in its various uses competes directly with cottonseed, linseed, and other domestic or imported oils. It competes indirectly with lard, as it is one of a number of vegetable oils that are used in the manufacture of compounds and vegetable shortenings. As many of these competing oils have the same or overlapping uses, their prices, including that of soybean oil, are affected more by the total supply of fats and oils relative to demand in these uses than by the production or supply of the individual oil. This is particularly true of soybean oil, because its supply is ordinarily much smaller than are the supplies of its major competitors.

As most of the soybean meal produced is used as a feed, it competes with cottonseed meal, linseed meal, and other high-protein feeds. Prices of meal are also determined more by the total supply relative to the total demand than by the supply of any individual product. The production of cottonseed meal is the most important element in the total supply.

With prices of soybeans dependent on prices of soybean oil and meal, and these in turn dependent on general supply and demand conditions in two highly competitive fields, it is evident that the market for soybeans in any one year will be influenced by the production of cottonseed, flaxseed, lard, and other competing commodities, as well as by the size of the soybean crop in that year.

During the last 3 years, in which the greatest increases in the production and crushing of soybeans took place, prices of soybeans were well maintained because of reduced supplies of competing products. Relatively short supplies of lard caused an increase in the demand for lard substitutes, and at the same time smaller cotton crops were resulting in reduced supplies of cottonseed oil, the most important oil used in compounds and vegetable shortenings. This combination of circumstances brought about a marked increase in demand for other edible oils, and the larger supplies of soybean oil resulting from increased crushings found a ready market here.

Because of small domestic production of flaxseed and cottonseed, the total supply of high-protein feeds was reduced at a time when drought was causing some increased demand, and the increased production of soybean meal also found a good market during most of this period.

Conditions during recent years, therefore, have helped the soybean and its products to attain, in a comparatively short time, a place of some importance in many fields of consumption. Had these conditions not prevailed, it is probable that the development of the soybean crop in the United States would have been considerably slower. The question naturally arises whether the substantial foothold gained in the last few years can be improved or even maintained in the face of increasing supplies of competing products.

To that question no conclusive answer can be given now. Much depends on consumer attitudes. Soybean oil and meal were first intro-

duced chiefly as substitutes in part to supplement or to replace other more generally utilized products. If consumers still regard them in that capacity then the prices of soybeans and their products will be depressed or their consumption will be reduced, or both, should supplies of competing products return to predepression levels. If, on the other hand, experience has persuaded consumers to accept the soybean and its products as independently essential, then increased production of competing products would tend to depress prices generally, unless this was offset by increased demand. In that case, soybeans would be affected no more than other products.

Experience has generally shown that soybean meal compares favorably with other protein concentrates. But, though soybean oil has been used for many purposes, it is still at some disadvantage as compared with more commonly used oils. Consequently much depends also upon whether research now in progress succeeds in overcoming the limitations in the use of the oil, and in developing new industrial uses for soybean meal.

Because of uncertain future demand some degree of caution is desirable in considering an increased production of soybeans for crushing purposes. Further increase should occur only in response to sustained or increased demand. A marked or too rapid expansion appears inadvisable until there is greater certainty that the demand existing in recent years will be maintained.

DEVELOPMENT OF SOYBEAN INDUSTRY

For centuries the soybean has been a major crop in the Orient, and it has been known in the United States since early in the last century. But only since the World War has it achieved commercial importance in this country, and only in the last few years have its industrial uses received widespread recognition.

Soybeans have probably received more attention and publicity in this country during recent years than any other crop of similar size and farm value. Several factors have been responsible for this, including the many uses of the soybean as a feed crop, and its adaptability to crop rotations in the Corn Belt. The relative freedom of the soybean from the chinch bug and other pest hazards, and its ability to withstand severe drought, have made it valuable in various emergency situations, particularly as a hay crop. Then there has been a marked increase in the use of soybeans in various soil-conserving and soil-building practices.

All these factors have contributed to the increased interest in this comparatively new crop, but the most important factor in attracting popular interest has been the rapid expansion of the soybean-crushing industry. With increased supplies available for industrial purposes in the last few years, a futures market for soybeans was established at Chicago in October 1936.

Because of the rapid expansion of the soybean-crushing industry, and recent attempts to develop greater industrial markets for farm products in general, there has been a tendency to emphasize the industrial demand for soybeans and soybean products. This bulletin outlines briefly the recent economic developments in the soybean market, analyzes factors affecting farm prices of soybeans, and indicates the present economic position of the soybean, particularly in its relation to industrial utilization.

SOYBEANS IN THE WORLD MARKET

Manchuria has long been the most important producing and exporting area for soybeans, and the Manchurian production is still by far the most important factor in the world supply in spite of increased production in the United States and other countries. The Manchurian crop of 1936 of 152 million bushels is estimated to have been about two-thirds of the total world production for that year, excluding China proper for which reliable statistical data are lacking. China, the United States, Chosen, Japan, and Netherland India are important producing areas, but produce largely for their own consumption. Many countries produce small quantities, including Bulgaria, Czechoslovakia, and the Union of Soviet Socialist Republics (table 1).

TABLE 1.—*Production of soybeans in specified countries, 1925–36*

Crop year	United States	Manchuria [1]	Chosen	Japan	Netherland India	Crop year	United States	Manchuria [1]	Chosen	Japan	Netherland India
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*		*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1925	4,875	126,092	23,609	17,109	4,038	1934	16,733	192,057	21,155	11,777	4,722
1926	5,239	107,740	22,276	14,213	3,008	1932	14,975	155,821	22,578	11,435	5,471
1927	6,938	163,319	24,309	15,467	3,961	1933	13,147	169,956	23,324	13,307	6,676
1928	7,880	177,804	19,510	14,190	4,303	1934	23,095	122,989	19,519	10,265	6,445
1929	9,308	178,389	20,434	12,585	3,917	1935	44,378	141,793	22,491	10,717	7,448
1930	13,471	190,944	22,989	14,281	4,692	1936 [2]	29,963	152,375	19,375	12,485	8,539

[1] Data for Manchuria are from reports of the South Manchuria Railway and do not include large production in China proper.
[2] Preliminary.

Compiled from official sources.

Manchuria controls the export market for soybeans almost completely, although small quantities are exported by the United States and other producing countries. Beginning in 1908 when the first large shipment of soybeans to England was made, a considerable market for Manchurian soybeans, soybean oil, and soybean cake and meal has developed in Europe. This trade was stimulated during the World War, when the general shortage of the more commonly used oils and fats induced an intensive search for substitutes, and resulted in the utilization of large quantities of soybean oil, both in Europe and the United States. This increase in consumption was largely temporary, but it provided the impetus for research and experimentation in the utilization of soybeans and soybean products, and the European market has expanded to the point at which it absorbs approximately one-third of the Manchurian production. Another third of the production is ordinarily exported to Japan and China. The remainder is retained for local use.

Until recently, the largest soybean importing countries in the order of their importance have been Germany, Japan, Denmark, and the United Kingdom. Since 1933, however, exchange restrictions and the policy of fostering national self-sufficiency in Germany have resulted in smaller imports, and in 1935 Germany's net imports of soybeans were less than those of Japan. There has also been a decline of imports into the United Kingdom since the import duty of 10 percent ad valorem was imposed in August 1935, and net imports into Sweden and the Netherlands were both larger in 1936 than net imports into the United Kingdom.

Manchuria is also the largest exporter of soybean oil and soybean cake and meal, but those countries which crush imported soybeans are additional elements in the export market for oil and cake. Until 1934, Germany was second to Manchuria in net exports of soybean oil; but with smaller quantities of soybeans imported for crushing during late years, imports of the oil have exceeded exports, and Denmark is now second to Manchuria in net exports. Denmark exports a large part of the oil obtained from the soybeans imported by that country, but retains most of the cake and meal for use as feed in its extensive dairy and poultry industries. Japan also has a net export balance for soybean oil, but the other important crushing countries, including the United Kingdom, Sweden, and the Netherlands, import more oil than they export. Most of the other European countries are also importers of soybean oil, with no single country outstanding.

RELATION OF UNITED STATES TO WORLD MARKET FOR SOYBEANS

Soybeans have occasionally been exported from the United States since 1931, but production in this country is not yet large enough to constitute a serious threat to export markets for Manchurian soybeans. On the other hand, tariffs on soybeans and soybean products are effective, to a considerable extent, in preventing imports of Manchurian products into the United States (tables 2 and 3). The tariff of 2 cents per pound on soybeans is equivalent to 14 cents per pound on the oil yield, and consequently has prevented imports for crushing. Varieties of soybeans not grown commercially in the United States are imported in small quantities for the manufacture of oriental foods and for experimental plantings. The duty on soybean oil is 3.5 cents per pound but not less than 45 percent ad valorem. Although imports of oil in 1935 and 1936 were increased because of the scarcity and high prices of edible oils in this country, they were still less than imports before 1930 when the present duty was imposed, and they were small compared with domestic production.

TABLE 2.—*Imports of soybeans, soybean oil, and soybean cake and meal, United States, 1912–36*

Calendar year	Soybeans [1]	Soybean oil [2]	Soybean cake and meal [1]	Calendar year	Soybeans [1]	Soybean oil [2]	Soybean cake and meal [1]
	1,000 bushels	*1,000 pounds*	*Short tons*		*1,000 bushels*	*1,000 pounds*	*Short tons*
1912	----------	24,775	4,078	1925	64	17,745	13,901
1913	----------	14,185	2,660	1926	62	30,167	21,435
1914	61	12,552	1,990	1927	70	13,731	26,975
1915	54	21,259	5,947	1928	71	12,264	48,405
1916	55	143,346	4,539	1929	72	19,360	65,927
1917	575	260,949	2,648	1930	64	7,831	56,813
1918	24	335,430	39	1931	59	4,018	19,310
1919	73	177,975	6,494	1932	43	359	18,284
1920	52	108,986	14,737	1933	8	3,669	33,351
1921	66	16,772	5,319	1934	6	2,829	30,194
1922	59	16,875	9,623	1935	4	14,248	53,732
1923	61	41,507	15,612	1936 [3]	3	7,188	21,317
1924	70	8,848	23,542				

[1] Imports for consumption.
[2] 1912–33, general imports minus reexports; 1934–36, imports for consumption.
[3] Preliminary.

Compiled from records of the Bureau of Foreign and Domestic Commerce.

The tariff of $6 per ton on soybean cake and meal has been less effective in preventing imports. During the period 1933–36, the average annual imports amounted to 34,500 tons, the greater part being used on the Pacific coast. Domestic production of soybean meal during the same period averaged about eight times as large as imports.

TABLE 3.—*United States tariff rates on soybeans, soybean oil, and soybean cake or meal, 1913–37*

Date effective	Soybeans per pound	Soybean oil per pound	Soybean cake or meal per pound
	Cents	*Cents*	*Cents*
Oct. 4, 1913	(1)	(1)	(2)
May 28, 1921	(1)	[3] 2.67	(2)
Sept. 22, 1922	0.50	2.50	(1)
June 18, 1930	2.00	[4] 3.56	[5] 0.30

[1] Free.
[2] Under par. 560 of the Tariff Act of 1913, soybean cake was free of duty. Under par. 385, soybean meal was dutiable at 15 percent ad valorem as an unenumerated manufactured article. These rates were not changed by the Emergency Tariff Act of 1921.
[3] 20 cents per gallon.
[4] But not less than 45 percent ad valorem.
[5] Equivalent to $6 per short ton.

At present, with production in the United States ordinarily not in excess of domestic needs, and with tariffs fairly effective in preventing imports, it is evident that the world supply of soybeans has little direct influence on the domestic market. In fact the domestic supplies of other oils, oilseed, and high-protein feeds will have a much greater influence than the Manchurian soybean crop, although total world supplies of all fats and oils will also be an important factor. But any marked increase in production beyond domestic requirements would force American producers to compete with Manchurian producers of soybeans in the world market. In that event, the Manchurian supply would become the dominant factor in the domestic situation.

SOYBEAN PRODUCTION IN THE UNITED STATES

In the United States, there has been a marked increase in acreage planted to soybeans since 1924, the first year for which adequate data are available. As soybeans are frequently interplanted with corn and other crops, especially in the Southern States, the solid-acreage equivalents of the interplanted acreage have been included in the total acreage figures. The equivalent of total solid acreage planted to soybeans in 1936 was 6.6 million acres, more than three and two-thirds times the 1924 acreage (table 4 and fig. 1), and for 1937 almost 7 million acres are indicated.

In the period 1924–34, two-thirds of the total acreage was ordinarily harvested for hay, about one-fourth was harvested for beans, and about one-tenth was not harvested either for hay or beans but was hogged-off or grazed. In the last 2 years, however, the proportion harvested for hay has decreased to one-half, with the acreage for beans constituting about one-third of the total. The acreage not harvested either for hay or beans showed a marked increase in 1936, representing 19 percent of the total. This was due to the use of soybeans as green

manure and in other soil-building activities, as encouraged by the program of the Soil Conservation Service.

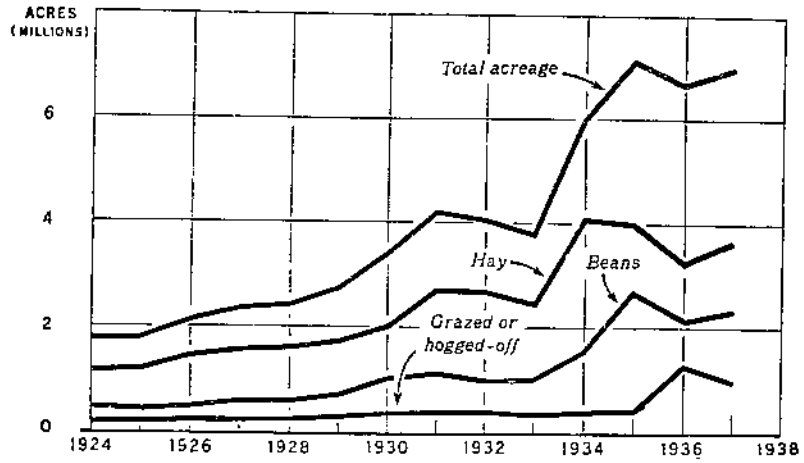


FIGURE 1.—ACREAGE OF SOYBEANS FOR HAY, BEANS, GRAZED OR HOGGED-OFF, AND EQUIVALENT OF TOTAL SOLID ACREAGE, 1924–37.

The 1937 data are preliminary. The total acreage of soybeans has more than tripled in the last 12 years, most of the increase having occurred since 1933. Acreage for hay has always exceeded acreage for beans, but the proportion of the total acreage harvested for beans has been larger since 1934. The marked increase in the acreage grazed or hogged-off in 1936 is due to the inclusion of soybeans used for soil-building purposes.

TABLE 4.—*Soybeans: Acreage for hay, beans, and grazed or hogged-off, United States, 1924–37* [1]

Year	Harvested for hay	Harvested for beans	Grazed or hogged-off	Total	Year	Harvested for hay	Harvested for beans	Grazed or hogged-off	Total
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*		*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*
1924	1,147	448	187	1,782	1931	2,700	1,103	390	4,194
1925	1,175	415	195	1,785	1932	2,675	977	397	4,049
1926	1,431	466	230	2,127	1933	2,443	997	337	3,777
1927	1,556	568	226	2,350	1934	4,069	1,539	386	5,994
1928	1,609	579	251	2,439	1935	4,000	2,697	414	7,111
1929	1,742	708	286	2,736	1936	3,251	2,132	1,263	6,646
1930	2,021	1,008	358	3,387	1937 [2]	3,659	2,337	986	6,982

[1] Including solid equivalent of interplanted acreage.
[2] Preliminary.

The upward trend in total acreage has been due partly to increases in acreage for hay and partly to larger acreages for beans. Most of this growth in both categories has taken place in the North Central States, with Illinois taking the lead. The increases in the Southern States have been slight, although there has been some expansion of acreage for all purposes in the last 2 years. The proportion of the total acreage harvested for hay has been about the same for both regions, but a much larger proportion is grazed or hogged-off in the South, and a correspondingly smaller part of the total acreage is harvested for beans.[3]

[3] For total acreage, acreage harvested for hay, acreage grazed or hogged-off, acreage harvested for beans, yields per acre, and production in selected States and regions, see table 13, p. 25.

Increasing acreage has been partly responsible for the larger production of soybeans during recent years, but there has also been an increase in average yields as a result of better growing and harvesting practices, and the introduction of adapted high-yielding varieties and strains in the Middle West. In the period 1924–26, the average yield in the United States was a little over 11 bushels per acre compared with an average of more than 15 bushels per acre in 1934–36. A record high of 17.5 bushels per acre is indicated for 1937. The increased average yield in the United States is almost entirely the result of larger yields in Illinois and other North Central States, yields in the Southern States having remained very much the same since 1924. Yield per acre in the north-central region has averaged around 16 bushels lately with about 10 bushels the average in the Southern States. Lower yields in the Southern States are due chiefly to the fact that a large percentage of the acreage is devoted to so-called hay varieties which produce less seed than the yellow-seeded commercial varieties.

Although there has been an upward trend in domestic production of soybeans since 1924, most of the increase has occurred in the last 3 years (table 5 and fig. 2). The largest crop was in 1935, when more than 44 million bushels of beans were gathered. Production in 1936, with smaller acreage and lower average yields, declined to less than 30 million bushels. The increase to 41 million bushels in 1937 was due largely to higher yields per acre in the North Central States. In beans gathered, the North Central States—and Illinois in particular—are predominant to an even greater extent than in total acreage. This fact is shown graphically by a comparison of figure 3 with figure 4. Of the 1936 production, 57 percent was in Illinois and 88 percent was in the north-central region. Production outside of this region is still small, North Carolina being the most important State. In the order of their production in 1936 and 1937, the five most important soybean-producing States are Illinois (which is more important than all the others combined), Indiana, Iowa, Ohio, and North Carolina.[4]

As soybean production has increased, a larger percentage of the beans gathered has been used for crushing purposes, but it was not until 1935 that the beans crushed constituted over one-half the production. Before that year, the demand for use as feed, or for seed the following year, was more important than the demand for crushing. The rapid expansion in total acreage, seed for which had to be provided from that part of the previous year's crop which was harvested for beans, was the chief factor in this situation, although an indeterminate quantity of soybeans has always been used as a stock feed.

[4] See footnote 3

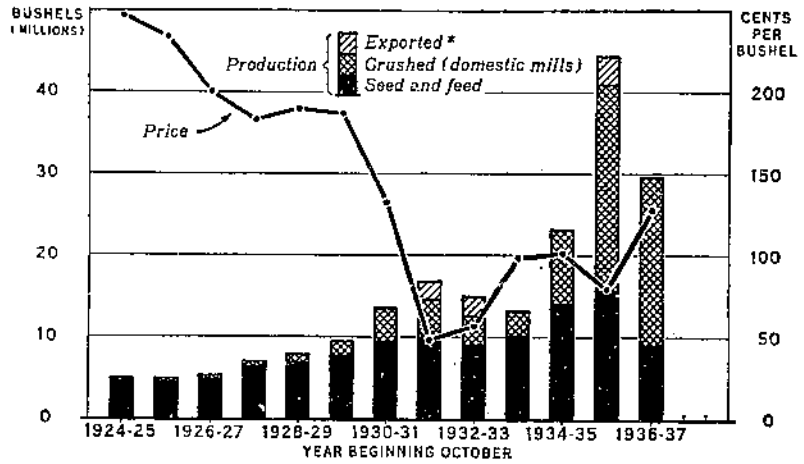


FIGURE 2.—PRODUCTION, UTILIZATION, AND AVERAGE FARM PRICE OF SOYBEANS, 1924–36.

There has been a marked increase in the production of soybeans in recent years, and with larger supplies available the quantities crushed have also increased tremendously. Exports have been small, and have occurred only in those years in which prices were relatively low. High prices in earlier years were due to the fact that a large part of the annual production was needed for seed purposes.

TABLE 5.—*Soybean production, quantity crushed, exports, change in stocks, quantity used for feed or seed, and average farm price, 1924–37*

Year beginning October	Production	Crushed [1]	Exported [2]	Increase (+) or decrease (−) in crushers' stocks [1 3]	Used for feed or seed [4]	Average farm price per bushel
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Cents*
1924	4,947	307		−3	4,643	247
1925	4,876	351		−2	4,526	234
1926	5,239	335		+2	4,902	200
1927	6,938	559		−2	6,381	193
1928	7,880	582		+70	6,928	190
1929	9,398	1,666		+46	7,686	187
1930	13,471	4,069		+378	9,024	132
1931	16,733	4,725	2,161	−372	10,219	48
1932	14,975	3,470	2,450	−64	9,119	56
1933	13,147	3,054		−32	10,125	95
1934	23,085	9,105	19	+293	13,678	101
1935	44,378	25,181	3,490	+42	15,665	79
1936 [5]	29,983	20,618		−68	9,433	127
1937 [5]	40,997					

[1] Animal and vegetable fats and oils, Bureau of the Census.
[2] Inspected for export by Federal licensed inspectors.
[3] Crushers' stocks at the end of the year are usually small.
[4] Production minus exports, quantity crushed, and change in stocks.
[5] Preliminary.

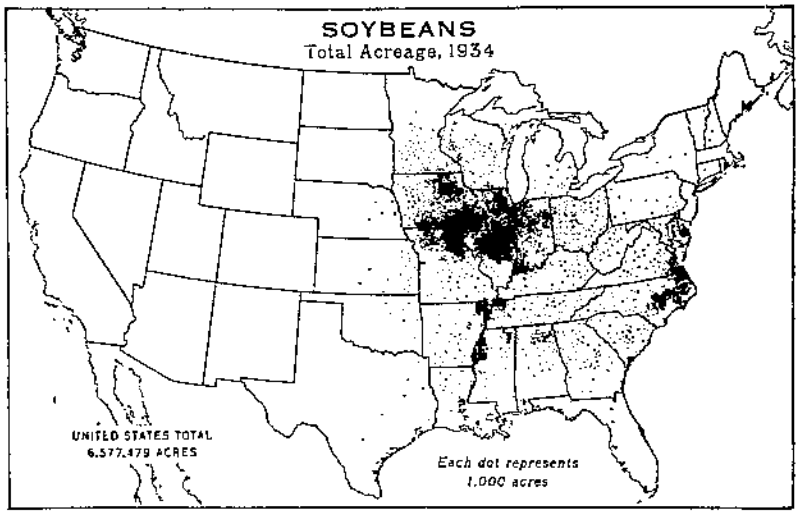


FIGURE 3.—Soybean acreage is confined almost entirely to the eastern half of the United States. About two-thirds of the total is in the North Central States, with most of the remaining acreage in the Southern States. Acreage in the South is chiefly for hay or forage.

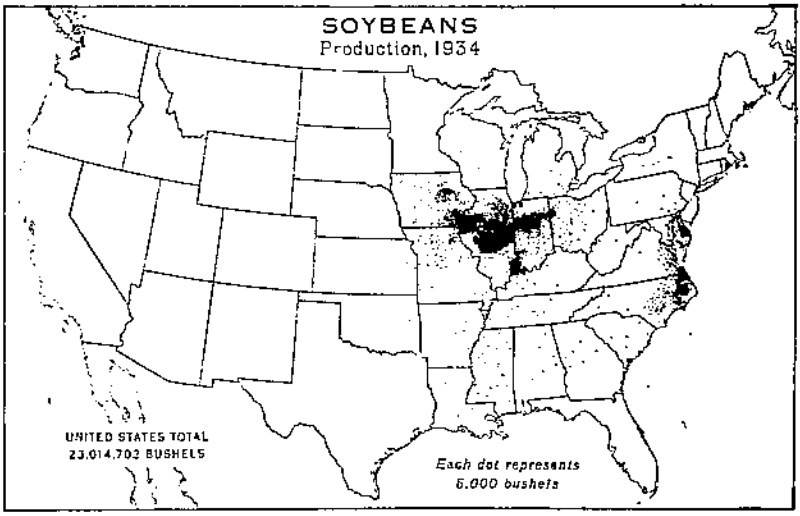


FIGURE 4.—Production of soybeans is confined almost entirely to Illinois and other Corn Belt States, and to a few small areas on the Atlantic seaboard. The North Central States account for about 90 percent of the total production in the United States. The greater concentration of bean production as compared with total acreage is shown by a comparison of this with figure 3.

Significant quantities of soybeans from the crops of 1931, 1932, and 1935 were exported, but even in 1935, with a record production, only 3.5 million bushels were exported, or less than 8 percent of the crop. With a smaller production in 1936 and prices far in excess of the world price, no soybeans were inspected for export during the 1936–37 marketing year.

The soybean is an important food product in oriental countries. In the United States, although bean milk, bean curd, soy sauce, and other food products are manufactured to some extent, the quantity of soybeans consumed directly by human beings is only a small fraction of the total available supply.

SOYBEANS USED FOR CRUSHING

Crushings of soybeans and the production of oil and meal have been much larger during the last 3 years than in previous years. The average annual quantity crushed in the United States during the period 1930–33 (years beginning in October) was 3.8 million bushels, or 26 percent of the total production. From the 1934 crop, 9 million bushels, and from the 1935 crop, 25 million bushels were crushed, representing 39 and 57 percent of production, respectively.[5] Almost 70 percent of the 1936 crop was crushed, but the actual volume of crushings was smaller than in 1935–36 because of reduced production.

At present, the production of the yellow varieties of soybeans suitable for crushing is largely limited to the North Central States and North Carolina. In other parts of the United States, almost the entire acreage is devoted to the black- and brown-seed types which are well adapted for utilization as hay or forage, but are undesirable for crushing. Production of soybeans for crushing purposes in these areas will depend to a considerable extent on the adaptation of yellow varieties to the different climatic and growing conditions. In the Southern States, cottonseed-oil mills could easily be used for crushing soybeans, if supplies were made available.

The expeller method of obtaining the oil is most commonly used for soybeans in the United States, although the hydraulic-press and solvent-extraction methods are used to some extent. The hydraulic press is almost universally used in this country for expressing the oil from flaxseed and cottonseed, whereas the extraction method is more common in Europe than in the United States. The latter is the most efficient in extracting the oil as it leaves in the meal less than 5 percent of the oil content of the beans. The expeller and hydraulic-press methods leave in the cake from 21 to 27 percent of the oil contained in the soybeans.

Although the oil content of soybeans is around 18 or 19 percent on a natural moisture basis, the average yield with present crushing methods in the United States has been only 14 percent, or about 8.4 pounds of oil per 60-pound bushel. This is a much smaller yield than is obtained from most other oil-bearing seeds, although the 15 percent of oil obtained from cottonseed is not significantly greater. The yield of cake or meal is about 80 percent or 48 pounds per bushel. The remaining 6 percent represents waste or loss in processing.

[5] Including soybeans exported for crushing in foreign countries, the percentages are 40 for 1934 and 65 for 1935, compared with an average of 34 percent in 1930–33.

A pound of oil is worth from two to five times as much as a pound of meal, depending on the prevailing prices. But with the comparatively low oil yield, the value of the oil from a bushel of soybeans is usually less than the value of the meal. The only time when this has not been the case in recent years was during a period of 9 months in 1935–36 when meal prices were exceptionally low (fig. 5). During the last 6 months of 1936, for example, a bushel of beans yielded on the average 69 cents worth of oil compared with 97 cents worth of meal. From the standpoint of total value, therefore, soybean meal must be considered the major product, with the oil merely a byproduct. If the solvent-extraction method of removing the oil from soybeans should become more widely used in this country, the average percent-

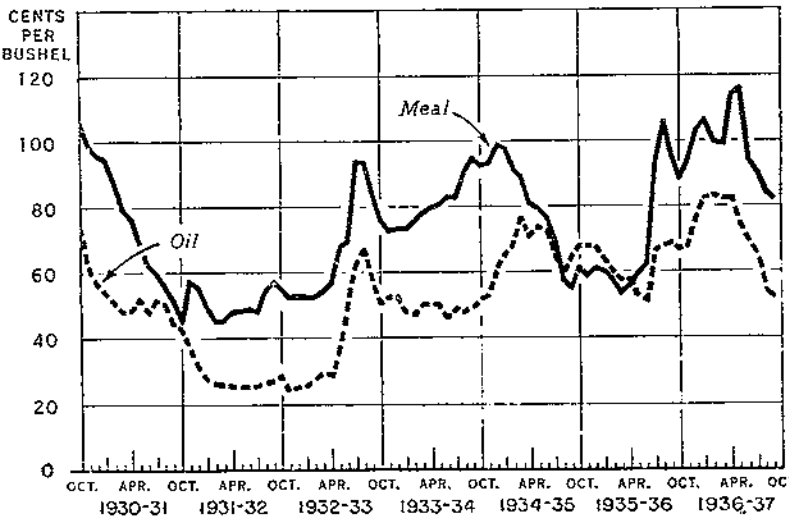


FIGURE 5.—VALUE OF OIL AND MEAL PRODUCED PER BUSHEL OF SOYBEANS, OCTOBER 1930–SEPTEMBER 1937.

Although a pound of soybean oil is worth more than a pound of soybean meal, the yield per bushel of soybean oil is not high enough for the value of the oil produced to equal that of the meal, unless meal prices are unusually low and oil prices high. This was the case from August 1935 to April 1936. Because the bushel value of the meal is ordinarily above that of the oil, prices of soybean meal have a little more influence on soybean prices than do prices of soybean oil.

age of oil extracted would tend to be somewhat higher than at present and the production of meal correspondingly lower. It is probable that any increase in unit costs involved in the wider application of this method would be more than offset by increased returns due to the higher oil yield.

SOYBEAN OIL

When properly processed, soybean oil can be adapted to a wide variety of uses. It was first used on a large scale in the United States during the World War, when large quantities of imported oil went into the manufacture of soap, replacing oils and fats exported to Europe. Smaller quantities were used in the manufacture of certain edible products. The increased imports during this period are shown in table 2.

Consumption fell off again after the war and remained relatively small until 1929 when larger supplies became available as a result of

increasing domestic production of soybeans for crushing. From 1931 to 1934 the most important outlet for soybean oil was in the paint and other drying-oil industries. Factory consumption declined slightly during this period, but the proportion used in the drying-oil industries increased steadily to 64 percent of the total in 1934, with

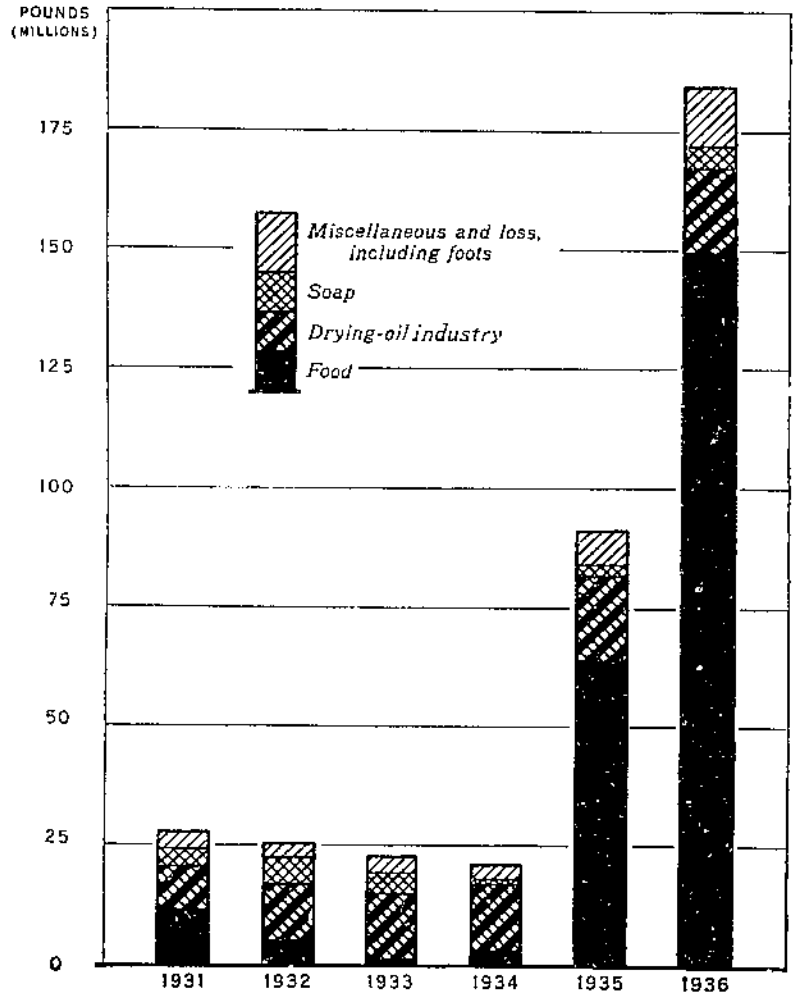


FIGURE 6.—FACTORY CONSUMPTION OF SOYBEAN OIL BY GROUPS OF INDUSTRIES, 1931–36.

Before 1935, soybean oil was used mostly as a drying oil. Its use in this field has not decreased materially, but increases in production during recent years have been accompanied by stronger demand for edible oils. Consequently most of the larger supplies have entered into the manufacture of food products, chiefly lard substitutes, and soybean oil is now predominantly an edible oil.

only 15 percent going into edible products in that year (fig. 6 and table 6).

Domestic production of soybean oil has kept pace with that of soybeans, and when soybean production increased in 1934 and again in 1935, the production of soybean oil also increased from 26 million

pounds in the 1933–34 marketing year to 78 and 209 million pounds in 1934–35 and 1935–36, respectively (table 7). Production of oil from the 1936 soybean crop was 184 million pounds. Because of reduced supplies of lard and cottonseed oil, the demand for soybean oil for edible uses was expanding at the same time. As a result, most of the increased production went into food products, chiefly into lard substitutes. In 1935 and 1936, the quantity of soybean oil used as a drying oil was actually larger than in previous years, but the tremendous increase in its use in food products has made it predominantly an edible oil in the last 2 years. In 1936, 81 percent of the factory consumption of soybean oil was in food products, with only 9 percent used in the drying-oil industries.

TABLE 6.—*Factory consumption of soybean oil, by classes of products, 1931–36*

Products	1931		1932		1933	
	1,000 pounds	*Percent*	*1,000 pounds*	*Percent*	*1,000 pounds*	*Percent*
Compounds and vegetable shortenings	10,869	39	4,889	19	489	2
Oleomargarine	623	2	3	(2)	7	(2)
Other edible			180	1	460	2
All food products	11,492	41	5,072	20	956	4
Soap	3,816	14	5,571	22	4,235	19
Drying-oil industry [1]	8,901	32	11,593	46	14,274	62
Miscellaneous	2,051	7	1,875	7	2,626	11
Loss, including foots	1,625	6	1,158	5	867	4
Total	27,885	100	25,269	100	22,958	100

Products	1934		1935		1936	
	1,000 pounds	*Percent*	*1,000 pounds*	*Percent*	*1,000 pounds*	*Percent*
Compounds and vegetable shortenings	2,735	13	52,452	57	113,897	61
Oleomargarine	24	(2)	1,740	2	14,202	8
Other edible	509	2	9,421	10	21,598	12
All food products	3,268	15	63,613	69	149,757	81
Soap	1,354	7	2,549	3	5,023	3
Drying-oil industry [1]	13,353	64	17,871	20	17,419	9
Miscellaneous	2,109	10	1,665	2	3,405	2
Loss, including foots	823	4	5,468	6	8,959	5
Total	20,907	100	91,166	100	184,563	100

[1] Includes paints and varnishes, linoleum and oilcloth, and printing inks. [2] Less than 0.5 percent.

Compiled from Factory Consumption of Primary Animal and Vegetable Fats and Oils by Classes of Products, Bureau of the Census, 1931–36.

TABLE 7.—*Factory production, net imports, stocks, and disappearance of crude soybean oil, 1922–36*

Year beginning October	Factory production	Net imports [1]	Stocks at end of year (September 30) [2]	Computed disappearance [3]	Year beginning October	Factory production	Net imports [1]	Stocks at end of year (September 30) [2]	Computed disappearance [3]
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*		*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1921			8,832		1929	13,424	5,814	12,986	17,983
1922	1,693	41,072	18,145	33,452	1930	34,688	107	16,000	31,871
1923	760	6,703	6,338	19,270	1931	39,946	[4] −2,339	16,688	36,919
1924	2,208	15,180	3,882	10,924	1932	29,078	1,422	10,895	36,293
1925	2,039	26,675	10,023	28,153	1933	26,196	[4] −96	14,854	22,141
1926	2,058	11,853	8,140	16,394	1934	78,123	9,509	14,220	88,260
1927	4,373	4,942	7,416	10,039	1935	208,965	5,219	39,172	189,238
1928	7,284	8,518	11,731	11,487	1936 [5]	183,711	16,906	36,044	203,745

[1] General imports minus domestic exports and reexports; beginning January 1934 imports for consumption minus domestic exports; crude and refined not separately reported.

[2] Stocks of crude plus stocks of refined adjusted for 6-percent refining loss.

[3] Factory production plus net imports (or minus net exports), plus stocks at end of previous year, minus stocks at end of year. [4] Net exports. [5] Preliminary.

Production and stocks data from Animal and Vegetable Fats and Oils, Bureau of the Census.
Foreign trade data from Foreign Commerce and Navigation of the United States.

In spite of the phenomenal increase in its use, soybean oil still plays a comparatively small part in the total domestic industry in fats and oils. Cottonseed oil continues to dominate the edible-oil field. Even in 1936, when consumption of soybean oil reached its peak, 52.5 percent of the factory consumption of primary fats and oils in food products was of cottonseed oil, while only 6.5 percent was of soybean oil. Moreoever, linseed oil is still the dominant factor in the drying-oil field, constituting 53 percent of factory consumption in 1936, compared with 3 percent for soybean oil. Table 8 contrasts domestic production of soybean oil with that of linseed and cottonseed oils.

TABLE 8.—*Production of soybean, cottonseed, and linseed oils in the United States, average 1928–32, annual 1933–36*

Marketing year [1]	Cottonseed oil, crude	Soybean oil, crude	Linseed oil	Marketing year [1]	Cottonseed oil, crude	Soybean oil, crude	Linseed oil
	Million pounds	*Million pounds*	*Million pounds*		*Million pounds*	*Million pounds*	*Million pounds*
Average 1928–32	1,552	25	527	1934	1,109	78	404
				1935	1,164	209	506
1933	1,303	26	443	1936 [2]	1,304	184	586

[1] Cottonseed oil, year beginning August; soybean oil, year beginning October; linseed oil, year beginning July.
[2] Preliminary.

Compiled from Cotton Production and Distribution, and Animal and Vegetable Fats and Oils, Bureau of the Census.

Soybean oil is usually classed as a semidrying oil, with an iodine number averaging around 134, compared with 188 for linseed oil.[6] As quick drying is one of the prime requisites for a paint oil, soybean oil can ordinarily be used in paints and varnishes only in combination with some other oil of higher drying qualities, such as linseed, perilla, or tung oil. It possesses one advantage over linseed oil in the fact that paints made from it do not yellow with age. For this reason it is frequently employed in making white or pale-colored enamel paints for interior use. But for most other purposes in the drying-oil field its use is on a price basis and is limited to from 10 to 50 percent of the oil used. In exterior paints, fast drying is especially necessary to prevent the collection of dirt, and to avoid spotting from moisture in the air. Soybean oil has recently been used extensively in combination with perilla oil, but the excise tax of 4½ cents per pound placed on perilla oil in August 1936 will tend to discourage the use of this mixture.

In food products, soybean oil is somewhat at a disadvantage because of its tendency to acquire an unpleasant flavor on aging. Because of this fact, a lower price is usually the basis for its utilization in this field also. Its use has generally been limited to lower grade products and those that have a quick turn-over.

Soybean oil is used to some extent in the manufacture of soap. But for a number of years, the demand in the United States for edible and drying-oil purposes has prevented any extensive utilization in this lower priced field.

[6] The iodine number or index of an oil gives an approximate measure of its drying ability, a high iodine number indicating a fast-drying oil.

With all these considerations in mind, it is evident that soybean oil must still be considered in this country chiefly as a substitute oil. There are a few minor uses for which it has been found to be more suitable than other oils, but for the most part it has been used as a substitute on the basis of its lower price. At various times during the last 25 years, it has found its chief outlet in each of the three major consumption fields for fats and oils—soap, the drying-oil industries, and food products. At present, therefore, soybean oil's most important advantage appears to be its versatility and ready adaptability to a wide variety of uses.

SOYBEAN MEAL

Soybean cake or meal, the product remaining after the oil has been separated, is used chiefly as a stock feed. As such, it competes with other domestically produced high-protein feeds, particularly linseed and cottonseed meals; and it is generally considered to be at least as valuable in dairy and other livestock feeds as either of these two meals.

Cottonseed meal is the dominant factor on the market because of its large supply.[7] In previous years cottonseed-meal production constituted almost two-thirds of the total production of protein concentrates (table 9), but because of smaller cotton crops, it has averaged only a little over one-half of total production in the last 3 years. Although domestic production of soybean meal jumped to 600,000 tons in 1935–36, it was still only one-third as large as cottonseed-meal production. It was larger in that year than the production of linseed cake and meal, which was materially lower than in earlier years. Production of linseed cake and meal in 1936–37 was 25 percent larger than that of soybean cake and meal, but a large part of the cake from imported flaxseed is not sold on the domestic market because it is profitable to reexport it in order to obtain the drawback.

TABLE 9.—*Production of high-protein feeds in the United States, average 1928–32, annual 1933–36*

Year beginning October	Cottonseed cake and meal [1]		Gluten feed and meal [2]		Linseed cake and meal [3]		Soybean cake and meal [3]		Copra cake and meal [3]		Peanut cake and meal [3]		Total	
	1,000 short tons	*Percent*	*1,000 short tons*	*Percent*	*1,000 short tons*	*Percent*	*1,000 short tons*	*Percent*	*1,000 short tons*	*Percent*	*1,000 short tons*	*Percent*	*1,000 short tons*	*Percent*
Average 1928–32	2,258	63.1	598	16.7	544	15.2	71	2.0	91	2.5	16	0.5	3,578	100.0
1933	1,834	61.4	580	19.4	394	13.2	74	2.5	94	3.2	10	.3	2,986	100.0
1934	1,588	56.8	456	16.3	418	15.0	223	8.0	64	2.3	46	1.6	2,795	100.0
1935	1,791	49.4	624	17.2	480	13.2	600	16.5	85	2.4	48	1.3	3,628	100.0
1936 [4]	2,143	54.6	551	14.0	616	15.7	492	12.5	68	1.7	59	1.5	3,929	100.0

[1] Compiled from Cotton Production and Distribution, Bureau of the Census.
[2] Compiled from reports of the Corn Refiners Statistical Bureau, Chicago, Ill.
[3] Computed from data in Animal and Vegetable Fats and Oils, Bureau of the Census.
[4] Preliminary.

Imported soybean meal is also an important competitor of the domestic product (see table 2). In markets on the Pacific coast, the duty on imported cake and meal is approximately offset by the railroad freight charges on meal from midwestern mills, as far as competition

[7] In the north-central region, the competitive position of soybean meal has been strengthened in the last few years, and it has been increasingly difficult for cottonseed meal to remain on even terms with soybean meal in that region.

between the domestic and imported product is concerned. Consequently most of the imports are consumed on the Pacific coast near the ports of entry. Exports have been small relative to total production, and it is not probable that domestic soybean cake or meal will enter foreign markets to any larger extent in the near future.

Many industrial products have been developed from soybean meal, including glue and plastics. As a plastic, it is employed in the automobile and electrical-appliance industries in the manufacture of various small articles, and has been the subject of experiment in other fields with varying degrees of success. An additional use is in the form of soybean flour, which is used in limited quantities in various food products. Some further expansion in the domestic consumption of soybean flour seems probable. Although these and other industrial uses have attracted much attention, it is probable that considerably less than 10 percent of the total production of soybean meal is consumed in industry. Because of the large production in 1935–36, it is estimated that less than 3 percent was consumed in these uses.

FACTORS AFFECTING THE PRICE OF SOYBEANS

Three important factors directly influence soybean prices—the price of soybean meal, the price of soybean oil, and the demand for soybeans as seed. Although the last factor is still of some importance, especially in the spring and early summer months, it is not the dominant element that it used to be. With larger quantities of soybeans being crushed for oil and meal in the last 3 or 4 years, the prices of these two commodities are the most important elements in the price farmers receive for their soybeans.[8]

When the combined value of the oil and meal in a bushel of soybeans is computed by months on the basis of monthly average prices of meal and oil, it can be seen that the price of soybeans fluctuates in much the same way but at a somewhat lower level (fig. 7 and table 10). Thus, when the prices of oil and meal rose so as to cause the oil-and-meal value of 1 bushel of soybeans to increase from $1.55 in October 1936 to $1.88 in January 1937, the average price of soybeans in the United States rose from $1.07 to $1.42 per bushel during the same period. Because the bushel value of the meal is ordinarily considerably above that of the oil, it is the more important of the two factors, and soybean prices have been more closely associated with meal prices than with oil prices, especially during the last year.

The correlation between the oil-and-meal value and the price of soybeans is by no means perfect, largely because of the seasonal demand for seed. Because of this factor, there is a marked seasonal variation in the spread between price and value. The spread is greatest in the fall when most of the new crop is being sold for crushing. The average spread from October to December for the years 1934–36 was 53 cents.[9] This represents the costs of marketing, transportation, storage, and processing, as well as the crushers' profits.

[8] Oil and meal prices, however, have no direct influence on prices paid for the black- and brown-seed types, which are undesirable for crushing and are sold exclusively for planting.

[9] Using Illinois prices instead of United States prices of soybeans, the average spread was 58 cents. Prices in Illinois are usually a little lower than average prices for the United States as a whole, because of the large production in that State, and the fact that a greater proportion of the production is crushed.

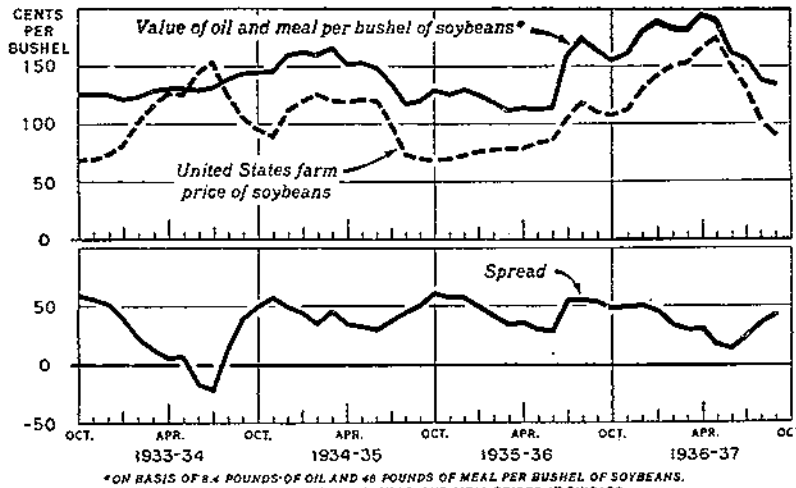


FIGURE 7.—FARM PRICE OF SOYBEANS, VALUE OF OIL AND MEAL PRODUCED, AND SPREAD BETWEEN PRICE AND VALUE, OCTOBER 1933–SEPTEMBER 1937.

Since a large part of the soybeans produced in the last few years has been for crushing, soybean prices have depended largely on prices of soybean oil and meal. Fluctuations in the farm price of soybeans have been closely associated with fluctuations in the total value of the oil and meal produced. A fairly well defined seasonal variation in the spread between price and value is due to the seasonal demand for seed. In earlier years, when the quantities crushed were much smaller relative to production, the demand for seed purposes was the most important factor influencing the farm price.

TABLE 10.—*Value of soybean oil and meal produced per bushel of soybeans, farm price, and spread between farm price and total value, United States, October 1933 to September 1937*

Year and month	Value of soybean oil and meal per bushel of soybeans			Farm price of soybeans per bushel	Spread between farm prices and total value	Year and month	Value of soybean oil and meal per bushel of soybeans			Farm price of soybeans per bushel	Spread between farm prices and total value
	Oil[1]	Meal[2]	Total				Oil[1]	Meal[2]	Total		
1933-34:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	1935-36:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
October	50	76	126	68	58	October	68	61	129	68	61
November	52	73	125	69	56	November	68	58	126	69	57
December	52	73	125	73	52	December	68	61	129	72	57
January	48	73	121	81	40	January	64	61	125	76	49
February	47	76	123	101	22	February	61	57	118	77	41
March	50	78	128	116	12	March	57	54	111	78	33
April	50	80	130	126	4	April	57	56	113	78	35
May	50	81	131	125	6	May	53	59	112	83	29
June	46	83	129	145	−16	June	51	62	113	85	28
July	49	83	132	154	−22	July	67	93	160	105	55
August	48	90	138	125	13	August	68	106	174	119	55
September	49	95	144	105	39	September	69	95	164	110	54
1934-35:						1936-37:					
October	52	92	144	95	49	October	67	88	155	107	48
November	53	93	146	89	57	November	67	94	161	112	49
December	61	99	160	111	49	December	77	103	180	130	50
January	65	98	163	119	44	January	82	106	188	142	46
February	68	92	160	126	34	February	83	100	183	150	33
March	77	89	166	126	40	March	82	99	181	152	29
April	71	81	152	118	34	April	82	114	196	166	30
May	73	80	153	121	32	May	75	110	191	174	17
June	72	76	148	119	29	June	69	94	163	150	13
July	65	70	135	98	37	July	65	90	155	132	23
August	60	57	117	73	44	August	54	84	138	102	36
September	64	55	119	69	50	September	52	82	134	90	44

[1] On the basis of 8.4 pounds of oil per bushel, and prices of soybean oil at midwestern mills.
[2] On the basis of 48 pounds of meal per bushel, and prices of soybean meal at Chicago.

During the spring and early summer months, this spread is reduced as the demand for soybeans for seed tends to raise their price without relation to the price of oil or meal. The average spread from April to June in 1935 and 1936 was only 31 cents,[10] but the effect of seed demand was most marked in 1934, when the demand for soybeans as seed, brought about by the drought, raised the price considerably above the oil-and-meal value in June and July.

Prices for soybeans are largely dependent upon prices for oil and meal, which in turn depend on the supplies and prices of competing commodities, the most important of which are cottonseed oil and meal, and linseed oil and meal.

As linseed oil dominates the field of drying oils, and cottonseed oil is more or less in control of the edible-oil field, prices for soybean oil fluctuate with the prices for linseed and cottonseed oil (fig. 8 and table 11). Before 1934, the price of soybean oil remained materially below

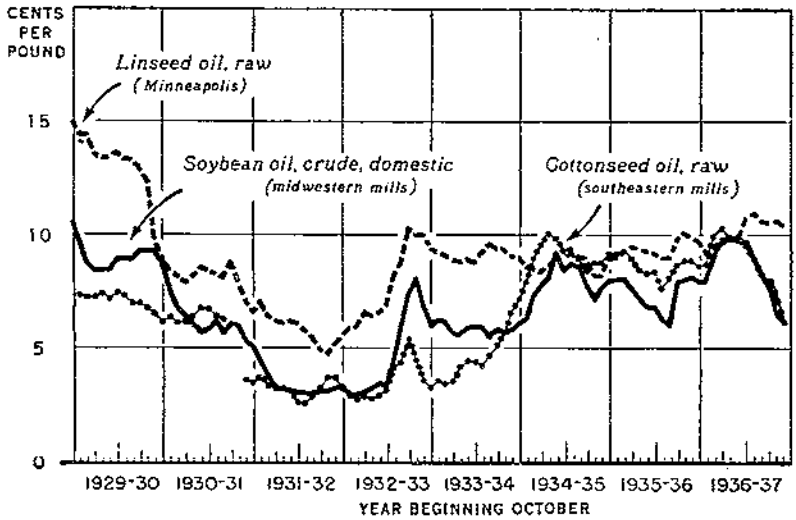


FIGURE 8.—PRICES OF SOYBEAN, COTTONSEED, AND LINSEED OILS AT SPECIFIED MARKETS, OCTOBER 1929–SEPTEMBER 1937.

Prices of soybean oil have been closely associated with those of cottonseed and linseed oils. Until 1934, soybean-oil prices were considerably below those of linseed oil, but usually somewhat above prices of cottonseed oil. Consequently, soybean oil competed chiefly with linseed oil, and found its major outlet in the paint and other drying-oil industries. But in 1934 relatively low supplies of lard caused an increase in demand for other edible oils. The price of cottonseed oil rose sharply, and soybean oil has since been used in large quantities in the manufacture of food products.

that of linseed oil, but was usually above the cottonseed-oil price. As a result, soybean oil competed chiefly with linseed oil. In the last part of 1934, however, the greatly reduced supply of lard caused an increase in demand for lard substitutes. This, together with the rather low supply of cottonseed oil, caused the latter's price to rise rapidly to a level around 9 cents per pound, where it has remained, with some minor fluctuations, through most of the 1936–37 marketing season. The price of soybean oil rose with that of cottonseed oil, and has since followed the latter's fluctuations fairly closely, usually remaining slightly lower.

[10] Using Illinois prices, the average was 38 cents.

TABLE 11.—*Average price per pound of soybean oil, linseed oil, and cottonseed oil, in tank carlots, specified localities, by months, 1929–36*

SOYBEAN OIL, CRUDE, MIDWESTERN MILLS

Year beginning October	October	November	December	January	February	March	April	May	June	July	August	September
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1929	10.69	9.70	8.79	8.38	8.38	8.45	8.97	8.92	8.94	9.31	9.29	9.28
1930	8.75	7.38	6.75	6.38	6.02	5.69	5.81	6.18	5.66	6.09	6.00	5.28
1931	5.06	4.38	3.75	3.28	3.16	3.12	3.06	3.00	3.00	3.10	3.12	3.22
1932	3.38	2.88	3.00	3.05	3.25	3.43	3.38	4.30	6.06	7.40	8.00	6.85
1933	6.00	6.25	6.22	5.65	5.60	5.93	5.95	5.95	5.80	5.80	5.69	5.80
1934	6.12	6.30	7.30	7.75	8.10	9.12	8.44	8.76	8.69	7.78	7.13	7.66
1935	8.06	8.06	8.10	7.64	7.20	6.81	6.81	6.26	6.03	7.92	8.03	8.17
1936	7.95	7.99	9.11	9.83	9.94	9.75	9.75	8.96	8.23	7.75	6.47	6.22
LINSEED OIL, RAW, MINNEAPOLIS												
1929	15.0	14.4	14.4	13.5	13.4	13.4	13.6	13.3	13.3	13.0	12.4	9.8
1930	8.8	8.4	8.2	7.9	8.2	8.6	8.4	8.3	8.1	8.8	7.9	7.1
1931	6.6	7.1	6.4	6.2	6.1	6.2	6.1	5.8	5.5	4.9	4.7	5.2
1932	5.5	5.9	6.0	6.6	6.4	6.6	6.9	8.2	8.8	10.3	10.0	10.0
1933	9.4	9.2	9.1	8.9	8.8	8.9	8.8	9.2	9.6	9.4	9.4	9.1
1934	9.0	8.6	8.5	8.4	8.7	9.0	9.1	9.2	9.1	9.0	8.2	8.2
1935	9.0	9.0	9.3	9.5	9.4	9.3	9.2	9.0	9.0	9.8	10.1	9.9
1936	9.7	9.2	9.5	9.8	9.8	10.0	10.8	10.9	10.6	10.5	10.6	10.4
COTTONSEED OIL, CRUDE, SOUTHEASTERN MILLS												
1929	7.33	7.38	7.26	7.24	7.40	7.13	7.48	7.32	6.95	7.00	6.76	6.48
1930	6.14	6.36	6.12	6.18	6.37	6.75	6.72	6.38	6.27			3.60
1931	3.54	3.80	3.33	3.24	3.22	3.12	2.61	2.56	2.86	3.24	3.71	3.71
1932	3.25	3.00	2.72	2.90	2.74	2.88	3.18	4.16	4.35	5.45	4.48	3.57
1933	3.23	3.58	3.43	3.56	4.18	4.44	4.40	4.23	4.68	5.10	5.65	6.55
1934	7.20	7.91	8.94	9.58	10.03	9.52	9.31	9.38	8.97	8.45	8.72	8.74
1935	9.17	9.16	9.36	8.91	8.45	8.30	8.36	7.62	8.08	8.67	8.86	8.86
1936	8.62	8.70	9.95	10.36	9.89	9.94	9.50	8.91	8.25	8.09	7.05	6.22

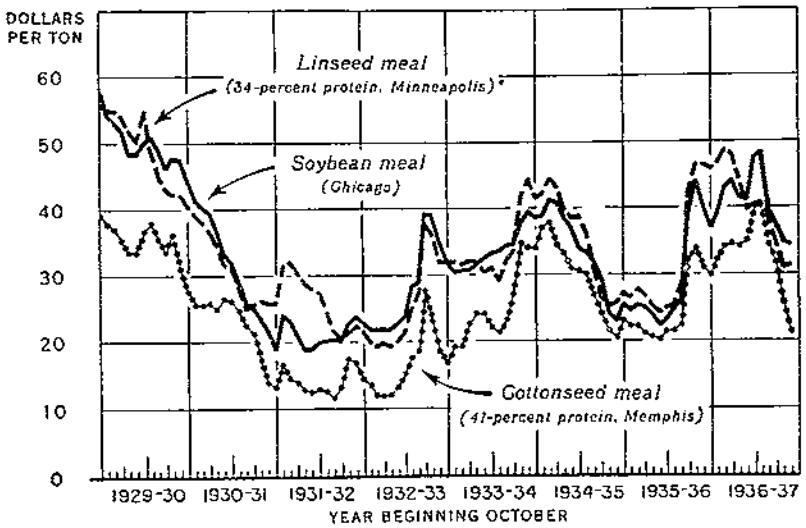
Compiled from Oil, Paint, and Drug Reporter; except cottonseed oil prices from October 1932 to June 1933, compiled from New York Journal of Commerce.

In general, it may be said that, under present supply conditions and with present technical knowledge, the price of soybean oil is not likely to rise above the price of both cottonseed and linseed oils, although it may be between the two. On the other hand, it cannot fall too far below the prices of these oils because of the demand for use in substitution which would arise if the spread became too great.

Similarly, the price of soybean meal is largely influenced by the supplies and prices of cottonseed and linseed meals, the former being the most important factor in the market because of large production. The price of linseed meal has been consistently above that of cottonseed meal; and the price of soybean meal has usually fallen between the two, although it has been consistently closer to, and has fluctuated more closely with, the price of linseed meal (fig. 9 and table 12).

PRESENT ECONOMIC POSITION OF THE SOYBEAN AND ITS PRODUCTS

Industrial utilization of soybeans and soybean products has recently attracted widespread attention and comment, but the total demand arising from industrial uses is relatively small at present, and soybeans must still be considered as predominantly a feed crop. During the last few years, two-thirds of the total acreage has been for immediate farm utilization either as hay or forage. Moreover, depending on the size of the crop, from 35 to 75 percent of the soybeans harvested from the remaining third of the acreage has been retained by farmers, or resold to them, for use as seed or feed. Thus, from 75 to 90 percent of the yield from the total acreage planted to soybeans has been consumed directly by farmers.



* REPORTED AS 37-PERCENT PROTEIN FROM APRIL 1933 TO NOVEMBER 1936, AND BEGINNING SEPTEMBER 1937

FIGURE 9.—PRICES OF SOYBEAN, COTTONSEED, AND LINSEED MEALS AT SPECIFIED MARKETS, OCTOBER 1929 SEPTEMBER 1937.

Soybean-meal prices are influenced by supplies and prices of other high-protein feeds. Production of cottonseed meal is the most important element in the total supply, but prices of soybean meal have usually been more closely associated with prices of linseed meal.

TABLE 12.—*Average price per ton of soybean meal, cottonseed meal, and linseed meal, bagged, specified markets, by months, 1929–36*

SOYBEAN MEAL, CHICAGO[1]

Year beginning October	October	November	December	January	February	March	April	May	June	July	August	September
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1929	58.32	54.20	53.06	51.82	48.25	48.20	50.15	50.70	48.75	46.00	47.80	47.58
1930	44.00	41.20	40.00	39.30	36.61	33.13	31.88	28.60	25.82	24.88	23.35	21.38
1931	18.58	23.84	23.00	20.45	15.75	18.58	19.00	19.95	20.20	20.03	22.60	23.70
1932	22.76	21.70	21.70	21.70	21.70	22.58	23.70	28.30	28.53	39.18	39.00	34.85
1933	31.68	30.13	30.50	30.60	31.50	32.50	33.25	33.60	34.50	34.50	37.75	39.50
1934	38.52	38.83	41.20	40.70	38.45	37.08	33.80	33.20	31.70	29.05	24.00	22.85
1935	25.62	24.40	25.50	25.15	23.90	22.30	23.28	24.78	26.10	38.90	44.28	39.70
1936	36.90	39.15	43.00	44.10	41.50	41.10	47.58	48.33	39.20	37.32	34.90	34.20

COTTONSEED MEAL, 41-PERCENT PROTEIN, MEMPHIS

1929	39.30	37.85	37.05	35.45	33.50	33.60	36.75	38.05	35.50	33.60	36.25	50.90
1930	27.50	27.60	25.60	25.75	24.00	26.45	26.25	24.55	22.40	21.20	17.30	13.81
1931	13.20	16.62	14.44	13.50	12.78	12.44	12.85	12.63	11.50	13.13	17.35	16.75
1932	14.38	13.32	11.81	11.85	12.00	13.69	15.22	17.50	18.59	27.63	22.90	18.38
1933	10.70	19.25	19.23	22.50	24.00	24.00	22.00	21.25	23.25	27.05	34.81	33.88
1934	33.90	37.00	37.75	34.63	33.25	30.80	30.45	30.00	26.95	24.30	21.50	20.29
1935	23.15	22.25	22.19	21.19	20.63	20.11	21.38	21.50	22.48	32.12	33.94	30.05
1936	29.01	32.25	34.20	34.66	34.29	35.28	40.13	40.31	34.53	31.56	25.90	21.31

LINSEED MEAL, 34-PERCENT PROTEIN, MINNEAPOLIS[2]

1929	55.70	55.10	55.00	54.10	51.75	50.30	54.75	48.70	44.75	42.75	42.20	42.10
1930	40.25	38.00	37.00	36.40	34.65	31.60	30.75	27.70	24.95	25.60	26.20	25.75
1931	25.70	31.40	32.10	30.15	28.75	28.00	27.30	24.25	21.40	20.40	21.40	22.40
1932	21.50	19.80	19.15	19.70	19.30	20.00	21.65	25.20	27.50	37.40	36.10	31.75
1933	31.70	31.90	31.65	32.00	31.00	30.15	30.90	29.20	32.25	33.40	41.75	44.00
1934	41.40	42.00	44.30	43.25	39.65	38.40	38.80	36.00	31.00	26.50	25.30	24.88
1935	27.40	26.63	27.80	27.13	25.50	24.20	25.63	25.38	28.60	42.12	46.38	46.30
1936	45.75	46.75	48.80	48.25	44.12	39.80	40.50	40.75	38.00	34.62	31.00	31.25

[1] Before January 1932, quoted in carlots.
[2] April 1933–November 1936, and September 1937, reported as 37-percent protein.

Published in Crops and Markets, U. S. Department of Agriculture.

The remaining 10 to 25 percent has been used for crushing purposes. Of the products of crushing, about 45 percent of the value has been ascribable to the oil that is used entirely in industry, and 55 percent to the meal, over nine-tenths of which is returned to farmers as stock feed. Approximately one-half, therefore, of the demand for crushing is derived indirectly from farmers. With these circumstances in mind, it is evident that industry has provided a rather small part of the total demand for soybeans during recent years, with farmers themselves the immediate or ultimate consumers of 90 to 95 percent of the yield from the total acreage of soybeans.

SOYBEAN OIL

Of the industrial demand, by far the greatest part is for soybean oil. It is important to note, therefore, that with present technical knowledge soybean oil is still essentially a substitute oil. The uses to which it has been found to be specially adapted supply an outlet for only a small part of the production. Most of the soybean oil now being consumed is used as a substitute, in whole or in part, for oils that are generally more expensive but better adapted to the purpose. In edible products it is at a disadvantage because of its tendency to acquire an unpleasant flavor on aging; consequently its use in this field is largely on the basis of its lower price. Efforts are being made to eliminate the flavor reversion, but thus far without much success. If and when supplies of lard and cottonseed oil return to their former high levels, consumption of soybean oil in food products may decrease sharply unless this disadvantage is overcome in the meantime.

In paints and varnishes soybean oil is handicapped by a relatively low drying power, and is mixed with other oils of higher drying qualities, chiefly on the basis of its lower price. Experiments have been undertaken to provide new and better methods for making use of soybean oil in the paint and other drying-oil industries. In the case of the paint industry, the popular preference for linseed oil must also be considered. Because of this, the progress of soybean oil in that industry must necessarily be gradual. If there should be a sudden decrease in demand for soybean oil in the edible field, it is probable that the drying-oil industries could absorb the surplus only at materially lower prices.

SOYBEAN MEAL

At present, the industrial utilization of soybean meal constitutes only a small part of production, and consequently an outlet for most of the meal produced must be found in the highly competitive feed market. Domestic soybean meal competes not only with cottonseed meal, linseed meal, and other domestically produced high-protein feeds, but also with Manchurian soybean meal which enters the United States in fairly large quantities over the present relatively low tariff. Any marked increase in the domestic price of soybean meal usually attracts larger imports, which in turn tend to depress the domestic price. An expanded industrial market for soybean meal, which would remove a larger proportion of the production from feed channels, would be highly desirable from the viewpoint of both grower and processor.

ELASTICITY OF DEMAND

Because of the highly competitive markets for soybean oil and soybean meal, and the subordinate position that each holds in its field so far as quantity produced is concerned, the demand for both oil and meal, and consequently the demand for soybeans for crushing, is relatively elastic. That is, an increase or decrease in the price of soybean oil or meal, relative to prices of competing products, would result in a marked change in consumption in the opposite direction. In the case of soybean oil, changes in relative prices may also result in shifts in consumption among food products, the drying-oil industries, and soap.

ELASTICITY OF SUPPLY

As indicated by the tremendous changes that occurred both in total acreage and in production during the last 3 years, the supply of soybeans is also highly elastic. Generally speaking, soybeans can be grown in practically all localities where corn can be grown, and consequently the acreage planted to soybeans could easily be expanded to several times the present acreage, if conditions warranted such an increase. Moreover, the production of beans is even more elastic than total acreage, for even if acreage remains the same, production can be increased or decreased by a change in the proportion of the total acreage that is harvested for beans. Increases are limited, however, by the extent to which growers are equipped to harvest beans. Production for crushing purposes in any one year will also be limited to the acreage of the yellow varieties. Finally, the supply available for crushing or export is still more elastic than production, since a variable quantity of soybeans is fed each year directly to livestock instead of being sent to the crushing mill. The cake or meal is a valuable feedstuff, and there is little loss in feeding value when soybeans are crushed. In fact for some types of feeding, the meal has proved more desirable than the beans. Consequently, with any given production, changes in industrial demand for oil or meal tend to bring a larger or smaller part of the production to the crushing mills.

The statements in the previous paragraph are aptly illustrated by events during recent years. The year-to-year changes in total acreage since 1929 have been fairly large, but the percentage changes in production have usually exceeded those in acreage. The relative fluctuations in the quantity crushed or exported in most years, have been two or three times the changes in production. Thus, total acreage in 1934 was 59 percent larger than in 1933, while production increased 76 percent, and the quantity crushed and exported increased almost 200 percent. In 1935, acreage increased 19 percent, production 92 percent, and the quantity crushed and exported 214 percent over the previous year.

SOYBEAN PRODUCTION

The marked increases in acreage and production that occurred in 1934 and 1935 were the result of several coincidental factors. Prices paid for the 1931 and 1932 crops of soybeans had been very low, but somewhat better prices had been received by growers in 1933. Moreover, prices of soybeans since 1930 had been relatively more attractive than prices of corn. These circumstances tended to bring about an increase in the 1934 acreage harvested for beans. The largest increase in 1934, however, occurred in the acreage for hay. The effects of the

drought were evident early in the season, causing farmers to plant a tremendously increased acreage of soybeans as an emergency hay crop. Finally, the program of the Agricultural Adjustment Administration reinforced these factors by limiting the acreage of other crops.

In the last part of 1934, when the shortage of lard and cottonseed oil had become apparent, there was an increased demand for edible oils, including soybean oil. Because of the drought there was also a strong demand for soybean meal. Consequently, the market for soybeans was good, and relatively high prices were paid to growers although production was much larger than ever before. This was probably the chief reason for the big increase in the acreage harvested for beans in 1935, although the continuation of the agricultural-adjustment program and the hazard caused by the chinch bug were additional factors. With favorable growing conditions for other hay crops, the soybean acreage harvested for hay was reduced slightly from the high level of 1934.

Demand for soybean oil remained fairly good in the last half of 1935 but meal prices were very low, and the prices paid for the large 1935 production of soybeans were considerably lower than the 1934 prices. Reduced production in 1936 resulted partly from lower yields and partly from a smaller acreage. The latter was caused by the elimination of the program of the Agricultural Adjustment Administration, and, to a lesser extent, by the somewhat lower prices paid for the previous year's crop. The fact that soybeans, when harvested for crushing, were classified as a soil-depleting crop under the soil-conservation program may also have been a factor.

Reduced production, together with strong demand for both soybean oil and soybean meal, resulted in fairly high prices for the 1936 crop. But prices of corn and other feed grains were also relatively high in 1936, and farmers did not increase their total soybean acreage very much in 1937. Unusually high yields per acre, however, caused production to exceed the 1936 production by more than one-third.

It is evident that much of the increase in acreage and production that has occurred since 1933 has been of an emergency nature, or the result of unusual conditions. Moreover, the increased crushing of soybeans during the last several years has been accompanied by an increased demand for the products of crushing. The relatively short supply of edible fats and oils has provided a good market for soybean oil in food products; and reduced production of cottonseed and linseed meals, together with drought conditions in 1934 and 1936, has resulted in a strong demand for soybean cake and meal during most of this period. Whether or not the demand for soybean products is to remain at its present level will depend to a considerable extent on future domestic and world supplies of competing products—particularly lard, cottonseed, and flaxseed.

If these supplies should return to their predepression levels,[11] a material reduction in the demand for soybeans for crushing may be expected, unless improved methods of utilizing soybean oil and meal in industry have been developed in the meantime. Extensive re-

[11] A record cotton crop in 1937 has already resulted in a large increase in the supply of cottonseed available for crushing, and prices of soybean oil and meal have fallen considerably from their 1936–37 levels. Production of lard, however, although apparently increasing, is still relatively low. Moreover, the domestic flaxseed crop in 1937 has not shown any significant increase over the low production of 1936, and the price of linseed oil has been 4 or 5 cents per pound higher than the price of soybean oil during the last quarter of 1937. If this large spread should continue, there might be some shift in soybean-oil consumption from edible products to the drying-oil industries.

search is now being carried on by various public and private agencies which are trying to discover new uses for soybean oil and meal, and to improve the technical methods involved in present uses. It is impossible to foresee the extent to which these experiments will be successful during the next few years.

In view of the uncertainty as to future demand conditions, a marked or too rapid increase in the production of soybeans for crushing does not appear advisable. Although facilities are available for processing and marketing a much larger crop than has so far been produced, there has not been an opportunity to observe the marketing of the crop under normal competitive conditions. The quantity of soybeans that can be marketed at favorable prices compared with those prevailing for competing products has not yet been demonstrated; and it is not clear at present to what extent soybeans and soybean products may tend to replace other products. Experience in the next few years will probably give a more definite indication concerning the position that soybeans are to fill in American agriculture and industry.

Acreage and production figures for recent years are given in table 13.

TABLE 13.—*Total acreage, acreage harvested for hay, acreage grazed or hogged off, acreage harvested for beans, yield per acre, and production of soybeans in the United States, and selected regions and States, 1924–37* [1]

Year	Total acreage	Acreage harvested for hay	Acreage grazed or hogged off	Acreage harvested for beans	Yield of beans per acre	Production
UNITED STATES						
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bu.*	*1,000 bu.*
1924	1,752	1,147	157	448	11.0	4,947
1925	1,785	1,175	195	415	11.7	4,873
1926	2,127	1,431	230	466	11.2	5,239
1927	2,350	1,556	226	568	12.2	6,938
1928	2,439	1,609	251	579	13.6	7,880
1929	2,736	1,742	286	708	13.3	9,398
1930	3,387	2,021	358	1,008	13.4	13,471
1931	4,194	2,700	390	1,104	15.2	16,733
1932	4,049	2,675	397	977	15.3	14,975
1933	3,777	2,443	337	997	13.2	13,147
1934	5,994	4,069	386	1,539	15.0	23,095
1935	7,111	4,000	414	2,697	16.5	44,378
1936	6,646	3,251	1,263	2,132	14.1	29,983
1937	6,082	3,659	986	2,437	17.5	40,997
NORTH CENTRAL STATES [2]						
1924	830	528	36	266	10.6	2,818
1925	710	468	20	222	11.8	2,625
1926	852	566	44	272	11.5	3,136
1927	1,041	642	34	365	12.1	4,422
1928	1,226	753	59	384	14.6	5,607
1929	1,344	866	64	480	14.6	7,004
1930	1,811	980	63	768	14.7	11,326
1931	2,394	1,512	56	824	16.6	13,667
1932	2,376	1,581	68	727	17.3	12,602
1933	2,176	1,363	50	763	14.1	10,770
1934	4,373	2,988	104	1,281	15.9	20,363
1935	5,349	2,817	112	2,420	17.1	41,379
1936	4,088	1,828	499	1,761	15.0	26,465
1937	4,623	2,370	295	1,958	18.8	36,863
SOUTHERN STATES [3]						
1924	860	556	136	164	11.7	1,924
1925	980	639	166	175	11.4	1,997
1926	1,127	773	174	180	10.6	1,911
1927	1,199	835	180	184	12.1	2,222
1928	1,111	750	183	178	11.3	2,003
1929	1,294	872	216	206	10.2	2,100
1930	1,472	963	291	218	9.2	2,008
1931	1,656	1,098	331	257	10.7	2,752
1932	1,540	986	328	226	9.3	2,113
1933	1,467	973	286	208	9.7	2,024
1934	1,480	979	280	230	9.9	2,284
1935	1,612	1,063	299	250	10.5	2,633
1936	2,382	1,280	757	345	9.2	3,183
1937	2,194	1,172	680	342	10.4	3,555
ILLINOIS						
1924	315	200	.....	115	12.0	1,380
1925	290	184	.....	106	13.5	1,431
1926	350	210	.....	140	12.5	1,750
1927	429	245	.....	184	13.0	2,392
1928	463	277	.....	186	16.5	3,069
1929	514	288	.....	226	17.0	3,842
1930	720	310	.....	410	17.0	6,970
1931	950	522	.....	428	18.0	7,704
1932	780	372	.....	388	20.0	7,760
1933	707	346	.....	361	15.0	5,415
1934	1,672	948	.....	724	19.0	13,756
1935	2,270	936	.....	1,334	18.0	24,012
1936	1,887	717	94	1,076	16.0	17,216
1937	2,151	903	108	1,140	20.0	22,800

[1] Acreage includes allowance for acreage grown with corn and other crops in States where interplanting is extensively practiced. Data for 1937 are preliminary. The States have been listed in the approximate order of their importance in the production of beans during recent years.

[2] Illinois, Indiana, Iowa, Kansas, Michigan, Missouri, Nebraska, Ohio, and Wisconsin.

[3] Alabama, Arkansas, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia.

TABLE 13.—*Total acreage, acreage harvested for hay, acreage grazed or hogged off, acreage harvested for beans, yield per acre, and production of soybeans in the United States, and selected regions and States, 1924–37*—Continued

INDIANA

Year	Total acreage	Acreage harvested for hay	Acreage grazed or hogged off	Acreage harvested for beans	Yield of beans per acre	Production
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bu.*	*1,000 bu.*
1924	204	109	29	66	9.9	653
1925	148	93	15	40	10.0	400
1926	189	111	36	42	12.6	529
1927	210	118	24	68	13.0	884
1928	289	171	49	69	14.5	1,000
1929	326	176	55	95	15.0	1,425
1930	443	248	44	151	14.0	2,114
1931	585	363	47	175	17.8	3,115
1932	563	371	51	141	16.0	2,256
1933	428	274	34	120	15.0	1,800
1934	621	391	45	185	16.0	2,960
1935	859	391	49	419	17.0	6,970
1936	748	345	134	269	14.0	4,186
1937	812	365	106	341	17.0	5,797

IOWA

Year	Total acreage	Acreage harvested for hay	Acreage grazed or hogged off	Acreage harvested for beans	Yield of beans per acre	Production
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bu.*	*1,000 bu.*
1924	23	13	------	10	12.0	120
1925	18	11	------	7	14.0	98
1926	24	14	------	10	15.0	150
1927	48	25	------	23	12.0	276
1928	63	42	------	21	17.0	357
1929	80	44	------	36	16.0	576
1930	124	57	1	66	15.5	1,023
1931	159	107	1	51	15.5	790
1932	217	163	2	52	18.0	936
1933	248	151	2	95	17.0	1,615
1934	853	656	17	180	11.5	2,070
1935	1,146	711	35	400	16.5	6,600
1936	580	297	81	182	14.0	2,548
1937	762	510	23	229	18.5	4,236

OHIO

Year	Total acreage	Acreage harvested for hay	Acreage grazed or hogged off	Acreage harvested for beans	Yield of beans per acre	Production
1924	66	44	2	20	11.5	230
1925	57	38	2	17	14.0	238
1926	61	41	2	18	11.5	207
1927	72	49	2	21	14.5	304
1928	84	58	2	24	15.0	360
1929	92	66	3	23	15.1	347
1930	112	77	4	31	14.0	434
1931	157	105	5	47	20.0	940
1932	156	117	5	34	15.5	527
1933	148	110	5	33	16.0	528
1934	203	155	7	41	17.0	697
1935	355	220	11	124	21.0	2,604
1936	330	162	36	132	15.5	2,046
1937	389	190	19	171	19.0	3,249

NORTH CAROLINA

Year	Total acreage	Acreage harvested for hay	Acreage grazed or hogged off	Acreage harvested for beans	Yield of beans per acre	Production
1924	165	70	20	75	15.5	1,162
1925	195	80	35	80	14.5	1,160
1926	220	95	40	85	12.5	1,062
1927	205	108	17	80	15.0	1,200
1928	210	100	30	80	13.5	1,080
1929	245	120	41	84	12.5	1,050
1930	340	150	93	97	12.0	1,164
1931	365	155	100	110	13.5	1,485
1932	350	150	95	105	11.0	1,155
1933	310	135	80	95	11.0	1,045
1934	320	152	76	98	12.0	1,176
1935	328	160	73	95	13.5	1,282
1936	430	175	137	118	12.5	1,475
1937	417	170	127	120	13.0	1,560

MISSOURI

Year	Total acreage	Acreage harvested for hay	Acreage grazed or hogged off	Acreage harvested for beans	Yield of beans per acre	Production
1924	165	112	5	48	7.5	360
1925	157	110	3	44	8.5	374
1926	220	161	8	53	7.5	398
1927	252	181	8	63	8.0	504
1928	281	197	8	76	9.5	722
1929	289	191	6	92	8.0	736
1930	361	247	14	100	7.0	700
1931	459	348	5	106	9.0	954
1932	523	424	10	89	10.0	890
1933	455	314	9	132	9.0	1,188
1934	602	523	35	134	5.5	737
1935	422	278	17	127	7.0	889
1936	350	165	136	49	5.0	245
1937	214	144	16	54	9.0	486

MISSISSIPPI

Year	Total acreage	Acreage harvested for hay	Acreage grazed or hogged off	Acreage harvested for beans	Yield of beans per acre	Production
1924	80	48	11	21	8.0	168
1925	91	59	11	21	10.0	210
1926	82	60	10	12	9.5	114
1927	167	127	21	19	10.0	190
1928	108	77	16	11	9.5	104
1929	115	85	18	12	9.0	108
1930	130	103	15	12	6.5	78
1931	211	148	38	25	9.0	225
1932	231	166	44	21	8.0	168
1933	210	153	40	17	9.0	153
1934	263	192	45	26	8.2	213
1935	330	231	59	40	8.5	340
1936	511	290	143	72	7.0	504
1937	431	229	155	47	8.5	400

VIRGINIA

Year	Total acreage	Acreage harvested for hay	Acreage grazed or hogged off	Acreage harvested for beans	Yield of beans per acre	Production
1924	100	74	11	15	13.0	195
1925	120	92	12	16	11.0	176
1926	147	116	14	17	14.0	238
1927	127	100	9	18	14.5	261
1928	126	98	8	20	13.0	260
1929	129	94	14	21	13.0	273
1930	130	79	40	17	7.0	119
1931	123	90	14	19	14.0	266
1932	124	84	22	18	9.5	171
1933	113	82	13	18	12.5	225
1934	109	77	11	21	13.5	284
1935	113	80	11	22	14.0	308
1936	122	80	18	24	11.0	264
1937	122	80	18	24	13.5	324

DELAWARE

Year	Total acreage	Acreage harvested for hay	Acreage grazed or hogged off	Acreage harvested for beans	Yield of beans per acre	Production
1924	18	6	------	12	11.0	132
1925	18	7	------	11	15.0	165
1926	14	6	------	8	14.0	112
1927	21	7	------	14	16.0	224
1928	22	9	------	13	17.0	221
1929	23	8	------	15	14.0	210
1930	25	10	------	15	6.0	90
1931	25	11	------	14	14.0	196
1932	30	14	------	16	10.0	160
1933	29	12	------	17	14.0	238
1934	29	12	------	17	17.0	289
1935	29	12	------	17	14.0	238
1936	32	13	2	17	13.0	221
1937	35	11	2	22	16.0	352

TABLE 13.—*Total acreage, acreage harvested for hay, acreage grazed or hogged off, acreage harvested for beans, yield per acre, and production of soybeans in the United States, and selected regions and States, 1924–37*—Continued

ARKANSAS

Year	Total acreage	Acreage harvested for hay	Acreage grazed or hogged off	Acreage harvested for beans	Yield of beans per acre	Production
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bu.*	*1,000 bu.*
1924	38	24	11	3	6.5	20
1925	50	36	10	4	6.0	24
1926	62	46	11	5	7.5	38
1927	78	61	12	5	12.5	62
1928	80	59	15	6	10.0	60
1929	109	82	20	7	10.5	74
1930	102	76	19	7	7.0	49
1931	135	101	22	12	9.5	114
1932	120	84	22	14	7.0	98
1933	114	87	10	17	9.5	162
1934	135	94	18	23	7.0	161
1935	146	104	17	25	9.0	225
1936	271	150	91	30	7.0	210
1937	266	144	69	53	10.0	530

TENNESSEE

1924	185	153	22	10	8.5	85
1925	170	142	20	8	7.5	60
1926	230	188	30	12	8.3	100
1927	202	165	28	9	8.0	72
1928	194	150	28	16	8.0	128
1929	211	164	30	17	7.5	128
1930	222	172	30	20	7.5	150
1931	235	174	35	26	7.5	195
1932	210	159	30	21	7.0	147
1933	192	133	40	19	7.5	142
1934	168	113	38	17	7.6	129
1935	169	108	41	20	6.0	120
1936	230	138	73	19	7.0	133
1937	230	127	73	30	7.5	225

ALABAMA

1924	107	81	23	3	6.5	20
1925	127	96	28	3	7.0	21
1926	125	100	21	4	4.5	18
1927	132	103	24	5	6.0	30
1928	87	69	14	4	6.0	24
1929	117	96	14	7	6.0	42
1930	157	129	20	8	5.0	40
1931	184	147	28	9	4.8	43
1932	118	97	14	7	6.0	42
1933	160	136	15	9	5.5	50
1934	167	140	17	10	6.0	60
1935	194	157	25	12	5.5	66
1936	282	204	34	24	6.0	144
1937	242	196	28	18	7.0	126

MARYLAND

1924	30	10	15	5	11.8	59
1925	34	19	9	6	12.5	75
1926	38	22	12	4	13.5	54
1927	37	22	12	3	14.0	42
1928	35	23	9	3	12.5	38
1929	32	22	5	5	12.0	60
1930	33	25	3	5	6.5	32
1931	34	27	------	7	13.5	94
1932	41	35	------	6	12.0	72
1933	37	30	------	7	13.0	91
1934	31	25	------	6	14.3	86
1935	32	28	1	5	12.0	60
1936	40	32	3	5	12.0	60
1937	36	24	5	7	14.6	102

MICHIGAN

Year	Total acreage	Acreage harvested for hay	Acreage grazed or hogged off	Acreage harvested for beans	Yield of beans per acre	Production
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bu.*	*1,000 bu.*
1924	8	6	------	2	13.0	26
1925	8	6	------	2	13.0	26
1926	7	5	------	2	14.4	29
1927	7	5	------	2	8.0	16
1928	11	9	------	2	15.0	30
1929	10	8	------	2	10.0	20
1930	7	6	------	1	10.0	10
1931	15	12	------	3	12.0	36
1932	20	11	------	9	13.0	117
1933	17	9	------	8	12.0	96
1934	27	19	------	8	10.5	84
1935	48	32	------	16	14.5	232
1936	53	38	------	15	12.0	180
1937	44	28	------	16	14.0	224

LOUISIANA

1924	45	32	5	8	8.0	64
1925	53	31	10	12	10.0	120
1926	80	44	18	18	8.5	153
1927	102	52	29	21	9.0	189
1928	112	53	42	17	7.5	128
1929	140	70	42	28	7.0	196
1930	131	76	35	21	7.5	158
1931	117	61	40	16	7.5	120
1932	115	60	44	11	7.5	82
1933	120	72	41	7	8.0	56
1934	109	57	41	11	7.5	82
1935	107	59	38	10	8.5	85
1936	151	45	83	23	9.0	207
1937	165	58	91	16	8.5	136

KENTUCKY

1924	45	30	6	9	9.5	86
1925	50	43	5	8	8.5	68
1926	85	65	13	7	9.0	63
1927	77	52	19	6	9.0	54
1928	101	88	11	5	10.0	50
1929	126	96	22	8	10.0	80
1930	114	88	17	9	7.5	68
1931	143	108	24	11	11.0	121
1932	138	107	21	10	11.5	115
1933	120	97	15	8	9.5	76
1934	109	81	19	9	10.0	90
1935	105	86	11	8	9.5	76
1936	132	87	36	9	9.5	86
1937	106	66	32	8	10.5	84

GEORGIA

1924	54	25	19	10	5.5	55
1925	70	33	25	12	6.5	78
1926	51	35	6	10	6.0	60
1927	63	44	10	9	6.3	57
1928	45	33	7	5	6.5	32
1929	48	33	7	8	5.5	44
1930	69	50	9	10	6.0	60
1931	94	68	13	13	5.2	68
1932	68	41	20	7	6.0	42
1933	65	45	13	7	5.0	35
1934	66	48	11	7	6.0	42
1935	68	48	11	7	6.0	42
1936	100	71	17	12	5.7	68
1937	101	66	23	12	6.2	74

TABLE 13.—*Total acreage, acreage harvested for hay, acreage grazed or hogged off acreage harvested for beans, yield per acre, and production of soybeans in the United States, and selected regions and States, 1924–37*—Continued

SOUTH CAROLINA

Year	Total acreage	Acreage harvested for hay	Acreage grazed or hogged off	Acreage harvested for beans	Yield of beans per acre	Production
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bu.*	*1,000 bu.*
1924	23	9	7	7	7.0	49
1925	38	21	9	8	5.5	44
1926	35	18	10	7	5.0	35
1927	34	17	10	7	6.0	42
1928	32	17	8	7	9.0	63
1929	34	20	7	7	7.0	49
1930	45	23	13	9	6.5	58
1931	56	30	16	10	5.5	55
1932	48	24	15	9	7.0	63
1933	50	23	18	9	6.5	58
1934	30	15	11	4	6.0	24
1935	32	14	11	7	7.0	49
1936	64	21	33	10	6.5	65
1937	59	19	31	9	6.0	54

PENNSYLVANIA

1924	7	7	------	------	------	------
1925	6	6	------	------	------	------
1926	8	8	------	------	------	------
1927	9	9	------	------	------	------
1928	9	9	------	------	------	------
1929	10	9	1	------	------	------
1930	11	10	1	------	------	------
1931	15	14	1	------	------	------
1932	18	17	1	------	------	------
1933	23	22	1	------	------	------
1934	24	20	2	2	16.5	33
1935	26	25	2	2	16.5	33
1936	38	34	2	2	15.0	30
1937	42	32	4	6	16.0	96

OKLAHOMA

1924	8	4	1	3	6.5	20
1925	10	6	1	3	12.0	36
1926	10	6	1	3	10.0	30
1927	12	6	1	5	13.0	65
1928	15	6	2	7	10.5	74
1929	20	12	1	7	8.0	56
1930	26	17	1	8	8.0	64
1931	23	16	1	6	10.0	60
1932	18	14	1	3	10.0	30
1933	13	10	1	2	11.0	22
1934	8	6	------	2	3.0	6
1935	8	6	------	2	10.0	20
1936	15	5	8	2	6.0	12
1937	20	9	8	3	9.3	28

TEXAS

1924	------	------	------	------	------	------
1925	------	------	------	------	------	------
1926	------	------	------	------	------	------
1927	------	------	------	------	------	------
1928	------	------	------	------	------	------
1929	------	------	------	------	------	------
1930	------	------	------	------	------	------
1931	------	------	------	------	------	------
1932	------	------	------	------	------	------
1933	------	------	------	------	------	------
1934	8	4	2	2	8.5	17
1935	14	10	2	2	10.0	20
1936	94	8	84	2	7.5	15
1937	35	8	25	2	7.0	14

KANSAS

Year	Total acreage	Acreage harvested for hay	Acreage grazed or hogged off	Acreage harvested for beans	Yield of beans per acre	Production
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bu.*	*1,000 bu.*
1924	11	9	------	2	11.0	22
1925	13	8	------	4	10.0	40
1926	12	8	------	4	10.0	40
1927	9	6	------	3	12.0	36
1928	13	9	------	4	11.0	44
1929	15	11	------	4	9.0	36
1930	27	20	------	7	7.5	52
1931	44	32	------	12	9.0	108
1932	44	33	------	11	7.3	80
1933	55	44	------	11	8.5	94
1934	47	40	------	7	5.0	35
1935	37	30	------	7	6.5	46
1936	39	33	------	6	4.0	24
1937	36	22	------	4	8.0	32

WISCONSIN

1924	38	35	------	3	9.0	27
1925	20	18	------	2	9.0	18
1926	19	16	------	3	11.0	33
1927	14	13	------	1	10.0	10
1928	22	20	------	2	12.5	25
1929	16	14	------	2	11.0	22
1930	14	12	------	2	11.5	23
1931	21	19	------	2	10.0	20
1932	39	36	------	3	12.0	36
1933	115	112	------	3	11.5	34
1934	251	249	------	2	12.0	24
1935	212	210	------	2	13.0	26
1936	118	98	18	2	10.0	20
1937	230	204	23	3	13.0	39

WEST VIRGINIA

1924	36	35	------	1	14.0	14
1925	32	31	------	1	13.0	13
1926	53	51	------	2	13.0	26
1927	39	37	------	2	14.0	28
1928	31	30	------	1	11.0	11
1929	28	26	------	2	12.0	24
1930	29	27	------	2	7.5	15
1931	33	31	------	2	12.0	24
1932	36	34	------	2	14.0	28
1933	37	35	------	2	12.0	24
1934	38	36	------	2	13.0	26
1935	49	47	------	2	10.5	21
1936	54	53	------	1	11.0	11
1937	40	39	------	1	12.0	12

NEW YORK

1924	4	4	------	------	------	------
1925	4	4	------	------	------	------
1926	3	3	------	------	------	------
1927	3	3	------	------	------	------
1928	3	3	------	------	------	------
1929	3	3	------	------	------	------
1930	3	3	------	------	------	------
1931	3	3	------	------	------	------
1932	3	3	------	------	------	------
1933	4	4	------	------	------	------
1934	6	5	------	1	14.0	14
1935	6	5	------	1	13.5	14
1936	5	4	------	1	13.0	13
1937	5	4	------	1	17.0	17

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