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Soybean Shipping Patterns in the United States For 1985

by

Donald W. Larson, Thomas R. Smith and E. Dean Baldwin*

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Abstract

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Information about soybean shipping patterns that enables the soybean industry participants to improve market performance through better decision making will contribute to a more efficient flow of soybeans. Such information may improve the investment decisions in port facilities, rail, truck and barge services, elevator and processor facilities, and farm production. The objectives of this paper are to determine regional soybean flows by mode of transportation for 1985 and compare these flows with similar data for 1977. Soybean flow data were collected for the 1985 calendar year through personal interviews, mail surveys and telephone calls with representatives of the soybean handling, storage and processing firms in 36 states.

The volume of soybean exports for 1985 is slightly less than for 1977, and the distribution of these exports by region reveals significant changes. The Gulf exports more than any other region and has become relatively more important from 1977 to 1985. Soybean exports from the Great Lakes have declined significantly and the Atlantic region exports have declined slightly in this period. The biggest relative increase in soybean exports occurred in the Pacific region. Changes in international markets, unit train shipment rates and increased size of ocean shipping vessels are the major factors explaining the changes in export shares among regions. This trend may continue into the 1990s affecting production, transportation and shipping patterns by export ports.

Barge shipments continue to be the dominant mode of transportation for export soybeans, accounting for 73 percent of all movements in 1985 compared to 61 percent in 1977. Truck and rail shipments declined from 16 to 8 percent and 23 to 19 percent, respectively, in this same period. Transportation deregulation does not appear to have helped the railroad compete for export bound soybeans. Strong competition among modes of transportation due to excess capacity in rail and barge transportation facilities in 1985 may explain this failure of railroads to gain market share relative to barge shipments. The elimination of the excess capacity since 1985 may change the rail-barge competitive structure during the 1990s.

Soybean Shipping Patterns in the United States for 1985

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Donald W. Larson, Thomas R. Smith and E. Dean Baldwin¹

Introduction

Maintaining our competitive edge in world soybean markets is an objective frequently stated by soybean farmers, merchandisers, processors, exporters, association groups and government officials. Many different factors contribute to our ability to maintain that competitive edge in world markets. One of those factors is an efficient flow of soybeans from production regions to domestic destinations and export ports. Information about soybean shipping patterns that enables soybean industry participants to improve market performance through better decision making will contribute to a more efficient flow of soybeans. Such information may improve investment decisions in port facilities, rail, truck and barge services, elevator and processor facilities, and farm production.

Although data on the quantities of soybeans shipped from each port and the amount of soybeans shipped on inland waterways are available, little information is available to match origins with destinations and to identify the mode of transportation. The first comprehensive national study of grain movements was completed and published in 1977 [Leath, Hill and Fuller]. The present paper updates the earlier study by reporting soybean shipping and receiving patterns for 1985. The main objectives of this paper are to determine the volume of soybeans moving between various origins and destinations and to determine the relative importance of the various transportation modes in the movement of soybeans. Through personal and telephone interviews and mail questionnaires with over 3,500

grain merchandisers, processors, and exporters throughout the United States, data on origins, destinations and transport modes for soybeans were assembled.

Soybeans, the miracle crop, have become the most important oilseed crop in the United States. As can be seen in Figure 1, production has increased very rapidly from less than five million bushels in the 1920s to over two billion bushels in the 1980s. In the 1979-80 marketing year, production reached a peak of 2.2 billion bushels (Table 1). Production in the drought year of 1983 declined to 1.6 billion bushels. Since then, production has fluctuated around two billion bushels annually. Among the major field crops, soybeans rank either third behind corn and wheat or second behind corn in annual volume produced from year to year.

Soybean use for domestic crush and export markets has increased very rapidly from the 1940s to the 1980s (Figure 2). Soybean exports reached a peak of 850 million bushels in the 1979-80 marketing year and the domestic crush also reached a peak of 1.1 billion bushels in that same year (Table 1). Exports declined significantly and domestic crush declined slightly from that record year to 1985-86 (Figure 2). The amount crushed (recently about 1 billion bushels annually) varies from year to year depending upon soybean production and the demand for oil and meal. Soybean disappearance for feed, seed and residual is a relatively small amount each year.

The rapid growth in soybean production, domestic crush and exports has placed large demands on the transportation system to handle these flows. Many changes in soybean shipping and receiving facilities at origins and destinations have been made to handle the increased flows. As can be seen in Figure 3, the 88 U.S. soybean processing plants operating

in 1988 are concentrated in the Cornbelt, Delta and Southeast which are also the main producing regions [American Soybean Association].

Methodology

The methodology followed in the 1985 study is very similar to that of the 1977 study [Leath, Hill and Fuller]. In their study and the present study, the United States was divided into 132 sub-regional areas and 31 ports as shown in Figure 4. Data for the 31 ports were aggregated into 13 port areas located in the four major export regions of Great Lakes, Atlantic, Gulf and Pacific (Table 2). Data for the 132 sub-regional areas were aggregated into 10 regions for reporting of the soybean production and shipping patterns information. The 10 regions are Northeast, Lake States, Cornbelt, Northern Plains, Southern Plains, Appalachia, Southeast, Delta, Mountain, and Pacific (Figure 5).

Soybean flow data were collected for the 1985 calendar year through personal interviews, mail surveys and telephone calls with representatives of the soybean handling, storage and processing firms in 36 states. These firms included country elevators, inland terminal elevators, river terminal elevators, export elevators, processors, feed manufacturers, and commercial feed lots. An Agricultural Experiment Station representative from 28 participating states was responsible for selecting the sample of firms and conducting the interviews. Information for an additional eight states was collected by a University of Illinois representative. The list of all firms in each state was prepared by obtaining information from various sources such as the feed and grain associations, State Department of Agriculture licensing offices and personal contacts. The questionnaire

was developed jointly by members of the Southern Regional Grain Marketing Committee and the North Central Regional Transportation Committee.

The procedure for the inland grain elevator sample in each state was to list the elevators in descending order of storage capacity. Starting with the largest, elevators were added to the sample until their total storage capacity equaled at least 25 percent of the inland elevator storage capacity in that state or sub-state region. Not less than 10 percent of the remaining elevators were selected at random. The procedure for river elevators was to select a random sample of at least 50 percent of the river elevators. Feed manufacturing firms in each state were arranged on the basis of production capacity from largest to smallest. Starting with the largest, feed firms were added to the sample until the total of their production capacity equalled or exceeded 10 percent of the feed manufacturing capacity in the state. At least 10 percent of the remaining firms were selected at random and included in the sample. All exporters and processors were included in the interviews. Some major processors did not provide data for the study so this had to be estimated from information furnished by shippers and other sources. Data from the random samples were expanded in proportion to the sampling rate to obtain estimates for the entire region or state.

The same types of information were collected from all of the grain handlers and processors interviewed. Each firm was asked to identify the volume of soybeans received from each of the 132 regions and the volume received by each mode of transportation. The firms were also asked to identify the volume of soybeans shipped to each region or port and the mode of transportation used.

Agricultural Experiment Station representatives verified the accuracy of the data collected, expanded the sample data to state totals and delivered the state summary data to the University of Illinois for preliminary processing. As the receivers' and shippers' data were tabulated, the Experiment Station representative in each state checked for discrepancies to identify any potential data errors. To the extent possible, the state representatives checked the data for each shipment to ascertain consistency and logic.

A micro-computer LOTUS program was used to reconcile the shipments and receipts from all states and regions with the national soybean balance sheet data [Wailes and Vercimak]. Data on the volume of soybeans shipped from origins to destinations by each transportation mode was also verified by direct and indirect comparisons with data from other sources. One indirect check was made by comparing the surplus or deficit calculated for each state, as reported in Table 3, with the total interstate shipments and receipts for each state. A second check on total volume was made by comparing total receipts reported at each port with U.S.D.A. Federal Grain Inspection Service data on soybean inspections for export. A third check was made on the reported shipments by mode with secondary data reflecting barge shipments on inland waterways provided by the U.S. Army Corps of Engineers and the U.S. Department of Transportation data on rail shipments. The flow estimates presented in the following sections represent the best information available on the actual volume of soybeans transported to domestic destinations and export ports by mode of transportation.

Soybean Production Patterns

Soybean production is concentrated in the Cornbelt with 58 percent of the 1985 production (Table 4). The Delta and Lake States possess a production share of 10 percent each. Appalachia and the Southeast have 7 percent and 5 percent shares, respectively, with almost no soybean production in other regions.

The share of production increased slightly for the Northeast, Lake States, Cornbelt and Northern Plains regions from 1977 to 1985 (Table 4). The large increase in the production share for the Northern Plains is partially explained by a severe drought in that region during 1977. The Appalachian, Southeast and Delta regions lost production shares for the same period. Changes in soybeans prices relative to other crops may explain the declining production shares for the Appalachia, Southeast and Delta regions.

Soybean Exports by Ports

Receipts of soybeans at ports by export region and mode of transportation for 1985 with comparisons for 1977 demonstrate major changes in soybean movements (Table 5). A comparison of the soybean flow results with the inspections for export results are also shown. In all cases, the soybean flow results are within 10 percent of the inspections for export.

Export shares by region have changed markedly. The biggest change is for the Great Lakes region where soybean exports decreased by 52 percent from 1977 to 1985. In the Atlantic region, soybean exports decreased by 13 percent while the Gulf region exports did not change. The biggest increase is the Pacific region where 1985 exports are almost 20 times that of 1977. Another growth area has been exports from inland

terminals which reached 22 million bushels in 1985 with no reported shipments in 1977. Most of these shipments go to Mexico by rail with some shipments also going to Canada. With these changes, the export shares by region in 1985 were: Great Lakes 5 percent, Atlantic 10 percent, Gulf 79 percent, Pacific 3 percent and other (inland terminals) 3 percent (Table 6).

Changes in international markets, the increased size of ocean shipping vessels and railroad deregulation may account for most of the adjustments in export shares among the ports. The emergence of the Pacific Rim countries (Japan, Korea and Taiwan) as important markets for soybeans has favored the exports from the Pacific and Gulf region ports compared to the Great Lakes and the Atlantic ports. The introduction of unit train rates from the western Cornbelt to the Pacific ports also facilitated the growth in exports to the Pacific region. In addition, the Gulf ports have an advantage in handling large ocean vessels compared to the Great Lakes.

The total receipts by mode of transportation indicate that barge shipments continue as the dominant mode of transportation accounting for 73 percent of all movements to ports in 1985 compared to 61 percent in 1977 (Table 5). Truck shipments declined from 16 percent in 1977 to 8 percent in 1985 and rail shipments declined from 23 percent to 19 percent in this same period.

The principal mode of transportation varies among the export regions. The Great Lakes ports receive almost 100 percent by truck while the Atlantic and Pacific regions receive almost everything by rail. Barge

receipts dominate in the Gulf region which also receives modest amounts by rail and truck.

The changes in the importance of the different transportation modes may be explained in large part by the changes in export market opportunities mentioned above. For example, trucking has become less important in export bound soybeans because the exports from the Great Lakes have declined. Barge has gained because the Gulf has gained. Rail transportation of soybeans is down even though the railroads have more ability to compete for traffic under the deregulated environment of 1985 compared to the regulated environment of 1977.

Interstate Shipments

Total interstate shipments of soybeans reached 1.1 billion bushels in 1985 compared to 765 million bushels in 1977, an increase of 44 percent (Table 7). Among the 10 regions, the Cornbelt continues to be the largest shipper, although the Cornbelt share of total shipments has decreased from 1977 to 1985. The Delta, Lake States, Southeast, and Appalachia are also large shippers of soybeans with the latter two showing significant increases during this period. The Northern and Southern Plains also had major increases in soybean shipments. These major increases may be linked to the new export market opportunities in the West and Southwest, the 1977 drought, and the introduction of unit train rates, all of which were discussed earlier.

Barge movements accounted for 42 percent of all movements, truck shipments accounted for 32 percent, and rail shipments accounted for 26 percent of all movements in 1985 (Table 7).² The transportation shares have changed, along with the major structural and regulatory changes in

our transportation system and grain marketing system during the 1977-1985 period. The share of total shipments by truck has increased by seven percentage points while the shares for barge and rail shipments have declined. Declining numbers of small elevators, increasing concentration of grain at train loading stations and barge facilities, and changes in the regional flow of export grain from east coast ports to the west coast may explain the changes in transportation shares.

Interstate Receipts

Total interstate receipts of soybeans surpassed 516 million bushels in 1985 compared to 273 million bushels in 1977, an increase of 89 percent (Table 8).³ Soybean receipts tend to be about one-half the volume of shipments. Just as in 1977, the Cornbelt leads all other regions in soybean receipts for 1985. Appalachia, Southeast, and Northern and Southern Plains, indicate increased receipts of soybeans during this period. Interstate soybean receipts in the Lake States declined from the 1977 results. These declines in receipts for the Lake States are most likely due to the shifts in export market activity discussed above.

Total interstate receipts of soybeans by mode of transportation show that truck accounts for 61 percent, rail 33 percent and barge 6 percent of all receipts. Consistent data are not available for 1977 to show how the soybean receipts by mode of transportation may have changed from 1977 to 1985.

Conclusions

Results from the 1985 soybean flow study reveal several important changes when compared with the results of the 1977 study. As can be expected, soybean production patterns continue to show a high concentra-

tion of production (58 percent) in the Cornbelt with the balance of production distributed among several regions.

The volume of soybean exports for 1985 (621 million bushels) is slightly less than for 1977, and the distribution of those exports by region reveals significant changes. The Gulf exports more than any other region and has become relatively more important from 1977 to 1985. Soybean exports from the Great Lakes have declined significantly and the Atlantic region exports have declined slightly in this period. The biggest relative increase in soybean exports occurred in the Pacific region. Changes in international markets appear to be a major factor explaining the changes in export shares by region from 1977 to 1985.

Barge shipments continue to be the dominant mode of transportation for export soybeans, accounting for 73 percent of all movements in 1985 compared to 1977. Truck and rail shipments declined from 16 to 8 percent and 23 to 19 percent, respectively, in this same period. Transportation deregulation does not appear to have helped the railroads compete for export bound soybeans. Strong competition among modes of transportation due to excess capacity in rail and barge transportation facilities in 1985 may explain this failure of railroads to gain market share relative to barge shipments.

Total interstate shipments of soybeans increased by 49 percent from 1977 to 1985 and total interstate receipts increased by 89 percent in the same period. Among the ten regions, the Cornbelt continues as the largest shipper and receiver of soybeans from 1977 to 1985. Barge, truck and rail accounted for 42 percent, 32 percent, and 26 percent, respectively, of all interstate soybean shipments in 1985. It is most interesting to note that

the percentage of total shipments by truck has increased while the percentage shipped by rail and barge has declined. This result suggests that all of the structural and regulatory transportation changes of the late 1970s and early 1980s did lead to changes in modal shares of interstate soybean shipments.

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Footnotes

1. The authors wish to acknowledge the contributions of Joseph Vercimak of the University of Illinois for his leadership in managing the collection and processing of the 1985 grain flow information. The authors also wish to thank Karlene Robison and Susie Sheller for assistance in typing the manuscript and Janice DeCarolis for assistance in chart preparation. This research was carried out with the cooperation of the Southern Regional Grain Marketing Committee and the North Central Regional Transportation Committee. The authors thank the review committee of T.Q. Hutchinson, Mike Reed, Albert Allen and Eric Wailes for their helpful comments.
2. Appendix Tables one through eight show soybean shipments by mode of transportation from each of the ten regions to domestic destinations and export ports.
3. Appendix tables nine through sixteen show soybean receipts by mode of transportation in each of the ten regions from reporting states. Receipts at export ports are not included in these tables.

**FIGURE 1: SOYBEAN PRODUCTION IN THE U.S.,
1920-1986**

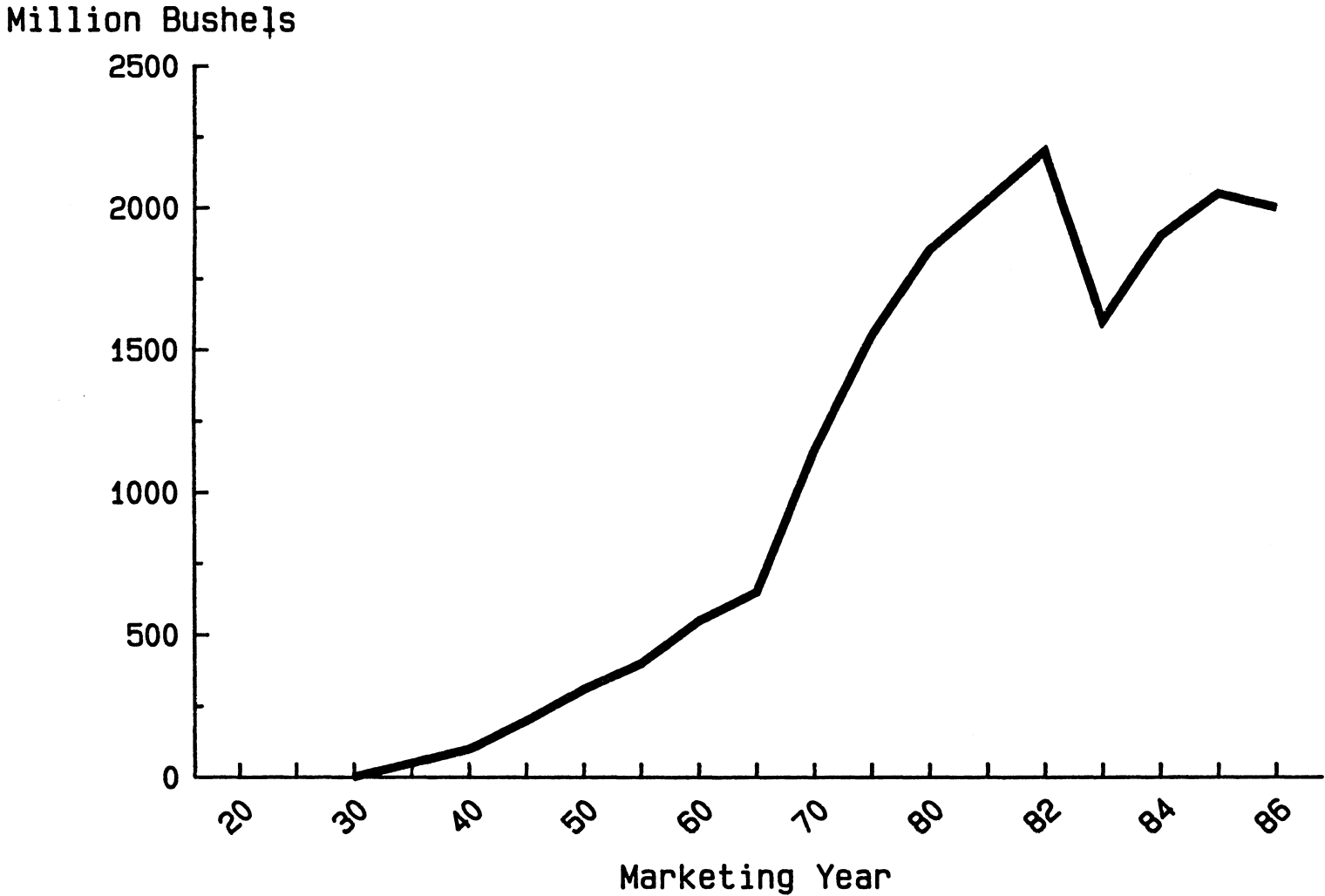


FIGURE 2: SOYBEAN USAGE IN THE U.S.

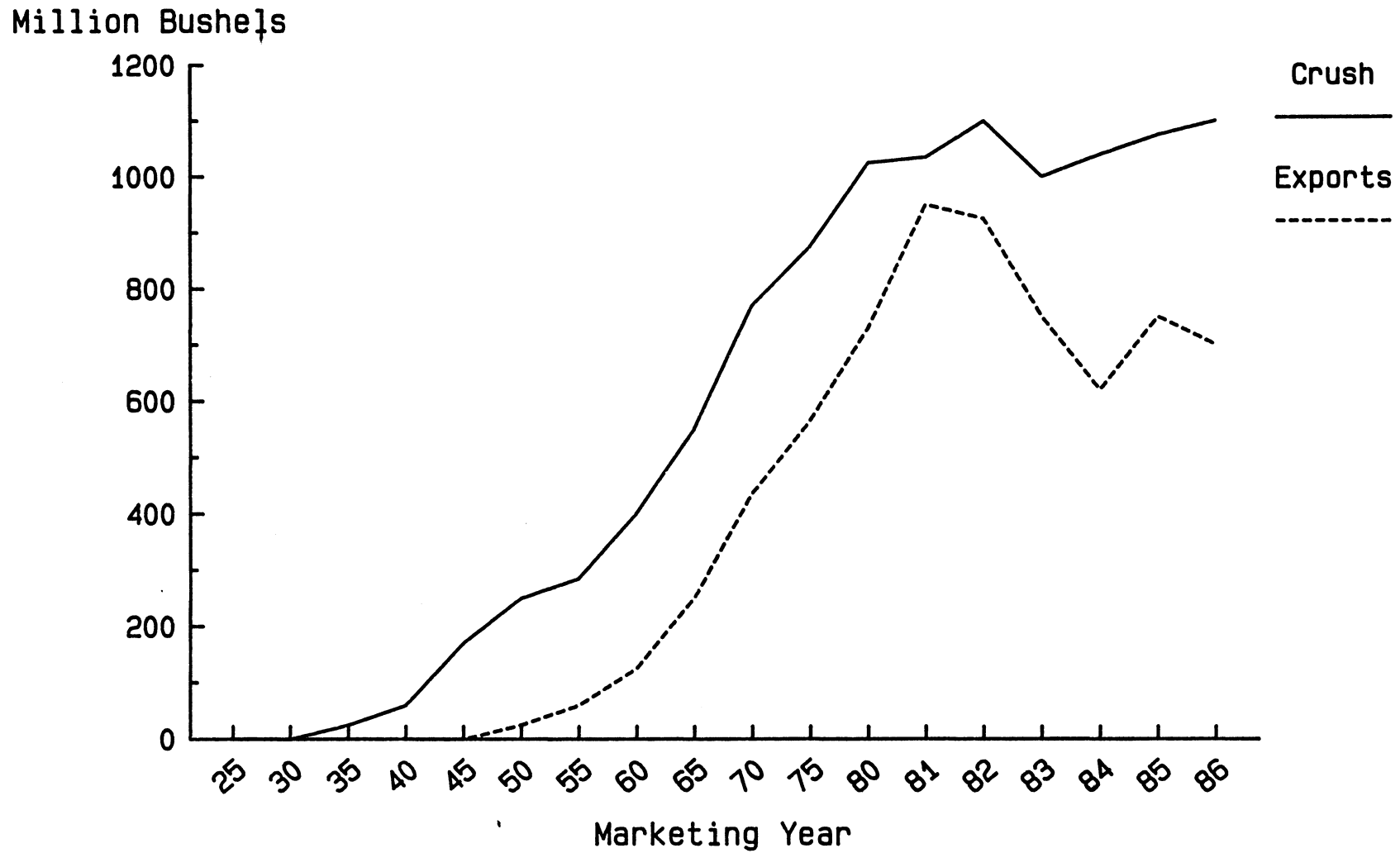


FIGURE 5: REGIONS USED FOR THE PROJECTIONS OF SOYBEAN PRODUCTION AND SHIPPING PATTERNS



FIGURE 4: LOCATION OF GRAIN FLOW STUDY REGIONS

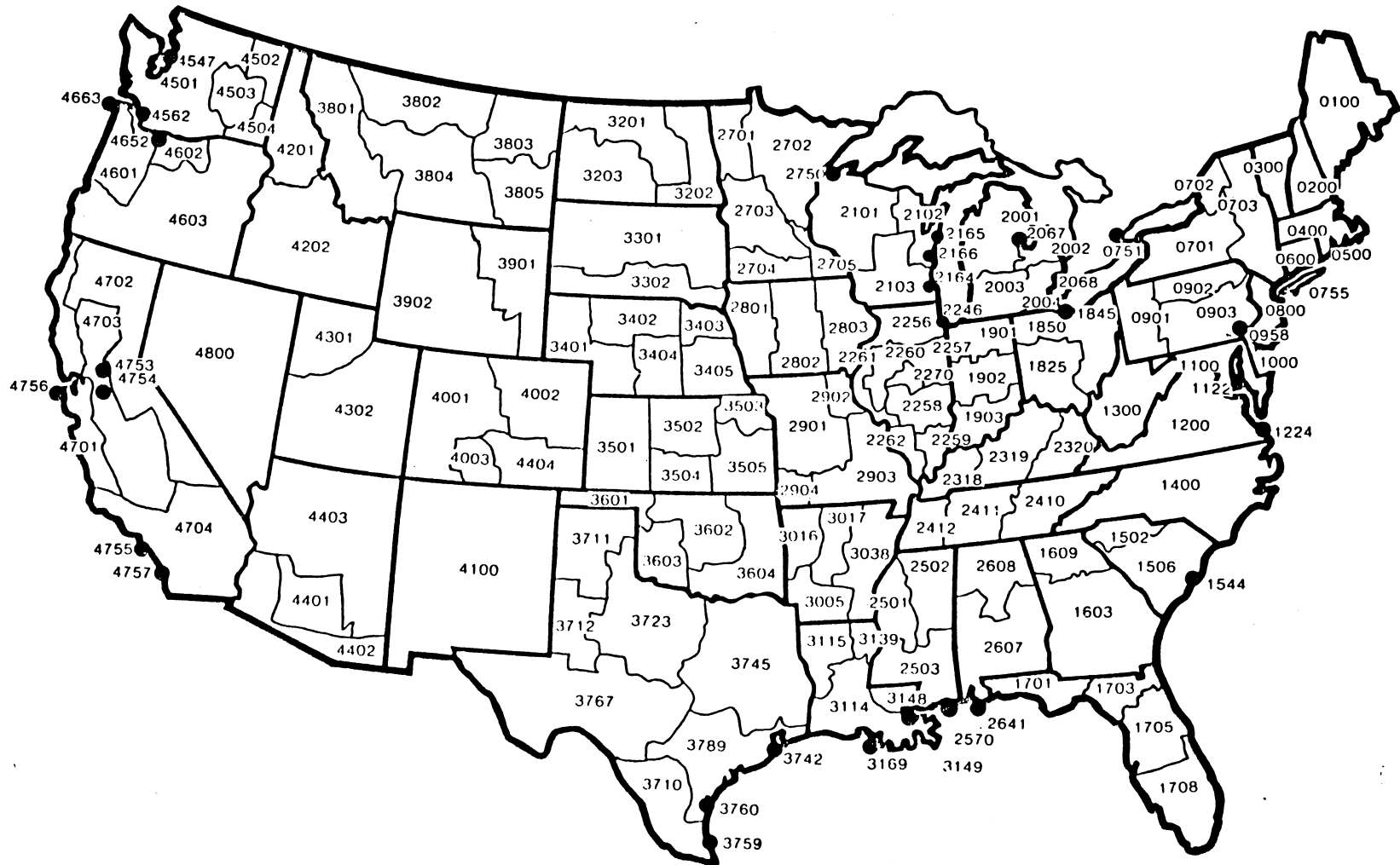


Table 1: Soybean Supply and Distribution in the United States for Marketing Years from 1971-72 to 1985-86

Marketing Year ^a	S U P P L Y			D I S A P P E A R A N C E					
	Beginning Stocks	Production	Total	Crushing	Seed	Feed	Residual	Net Exports ^b	Total
1971-72	99	1,176	1,275	721	51	1	13	417	1,203
1975-76	185	1,547	1,732	865	54	1	13	555	1,488
1979-80	174	2,268	2,442	1,130	80	0	17	850	2,077
1985-86	316	2,098	2,414	1,088	63	0	?	617	1,768

^a Beginning September 1.

^b The volume imported was negligible.

^c Preliminary data.

Source: Fats and Oils Situation, Economics and Statistics Service, U.S. Department of Agriculture, FOS-300 (July, 1980), p.6.

Table 2: Export Regions, Port Areas, and Port Cities

Export Region	Port Area	Port City
Great Lakes	Duluth-Superior	Duluth, MN Superior, WI
	Chicago	Milwaukee, WI Manitowoc, WI Racine, WI Chicago, IL
	Toledo	Toledo, OH Huron, OH Erie, PA Buffalo, NY
	Saginaw	Carrollton, MI Saginaw, MI Zilwaukee, MI Detroit, MI
Atlantic	North Atlantic	Portland, ME Albany, NY Philadelphia, PA
	South Atlantic	Baltimore, MD Norfolk, VA North Charleston, SC
Gulf	East Gulf	Pascagoula, MS Mobile, AL
	Louisiana Gulf	Mississippi River Lake Charles, LA
	North Texas Gulf	Beaumont, TX Port Arthur, TX Houston, TX Galveston, TX
	South Texas Gulf	Brownsville, TX Corpus Christi, TX
Pacific	Columbia River	Kalama, WA Longview, WA Vancouver, WA Portland, OR Astoria, OR

Table 2, continued

Export Region	Port Area	Port City
Pacific	Puget Sound	Seattle, WA Tacoma, WA
	California Ports	Sacramento, CA Stockton, CA Long Beach, CA San Francisco, CA San Diego, CA

Table 3: Soybeans Balance Sheet by States, 1985

State	Carry-in	Pro- duction	UTILIZATION			Carry-out	Surplus or Deficit
			Seed	Pro- cessors	Total		
----- '000 bushels -----							
Alabama	15,797	27,810	1,018	41,000	42,018	18,365	-16,786
Arizona	0	0	0	0	0	0	0
Arkansas	69,216	98,050	3,533	48,666	52,199	60,597	54,470
California	50	0	0	0	0	50	0
Colorado	36	0	0	0	0	35	1
Delaware	7,602	7,200	231	19,138	19,369	7,674	-12,241
Florida	1,592	5,980	245	0	245	2,294	5,033
Georgia	29,854	37,200	1,696	43,420	45,116	25,272	- 3,334
Idaho	0	0	0	0	0	0	0
Illinois	257,122	382,500	9,051	226,064	235,115	352,855	51,652
Indiana	90,398	185,090	4,476	56,829	61,305	118,009	96,174
Iowa	236,926	309,700	7,786	168,780	176,566	322,273	47,787
Kansas	23,279	43,710	1,413	37,166	38,579	39,991	-11,581
Kentucky	29,057	41,820	1,451	17,000	18,451	32,430	20,016
Louisiana	30,299	44,100	2,120	20,000	22,120	29,078	23,201
Maryland	11,167	12,800	386	51,279	51,665	7,053	-34,751
Michigan	22,756	34,560	1,094	0	1,094	28,930	27,292
Minnesota	154,413	160,000	5,339	62,310	67,649	196,427	50,337
Mississippi	52,726	70,740	2,403	38,277	40,680	47,451	35,335
Missouri	77,681	180,435	4,994	70,000	74,994	129,381	53,741
Montana	0	0	0	0	0	0	0
Nebraska	60,303	84,960	2,387	27,073	29,460	79,630	36,773
Nevada	0	0	0	0	0	0	0
New England	0	0	0	0	0	0	0
New Jersey	1,873	4,386	177	0	177	2,130	3,952
New Mexico	50	0	0	0	0	50	0
New York	50	0	0	0	0	36	14
N. Carolina	31,298	39,100	1,790	12,546	14,336	28,177	27,885
N. Dakota	9,538	12,740	576	0	576	11,908	9,794
Ohio	102,767	160,605	4,900	61,076	65,976	113,783	83,613
Oklahoma	1,605	4,370	187	0	187	2,073	3,715
Oregon	50	0	0	0	0	50	0
Pennsylvania	3,527	5,950	275	0	275	2,973	6,229
S. Carolina	24,585	24,600	1,148	28,176	29,324	19,240	621
S. Dakota	21,679	40,640	1,273	0	1,273	28,745	32,301
Tennessee	25,753	45,260	1,335	38,005	46,668	22,854	8,819
Texas	6,259	7,250	285	0	285	7,441	5,783
Utah	50	0	0	0	0	50	0
Virginia	12,833	17,375	754	1,808	2,562	15,083	12,563
Washington	50	0	0	0	0	50	0
W. Virginia	50	0	0	0	0	50	0
Wisconsin	9,778	9,600	440	0	440	7,791	11,147
Wyoming	0	0	0	0	0	0	0
U.S.	1,422,059	2,098,531	62,761	1,068,613	1,138,704	1,760,279	629,554

Table 4: Soybean Production by Regions of U.S. for 1985

Region	Soybean Production (000,000 bu.)		Percent of U.S. Production	
	1985	1977	1985	1977
Northeast	25.9	16.6	1.2	0.9
Lake States	204.2	162.2	9.8	9.2
Cornbelt	1,219.1	1,000.7	58.2	56.8
Northern Plains	182.0	82.0	8.7	4.6
Southern Plains	11.5	28.0	0.5	1.6
Appalachia	143.5	130.5	6.8	7.4
Southeast	95.6	90.2	4.6	5.1
Delta	212.8	247.3	10.2	14.0
Mountain	0	0	0	0
Pacific	0	0	0	0
Total	2,098.0		100.0	

Table 5: Receipts of Soybeans at Port Area By Mode of Transportation, 1985, and 1977 Total Receipts

Export Region and Port Area	1985				1977 ^b	
	Mode of Transportation				Inspections ^a	
	Truck	Rail	Barge	Total	For Export	Total
	(000 Bushels)					
Great Lakes Region:						
Duluth-Superior						
Chicago	2924			2924	1800	14187
Toledo	26448	165		26613	26612	46795
Saginaw	64			64	63	1148
SUBTOTAL	29436	165		29681	28475	62130
Atlantic Region						
North Atlantic		6552		6552	6604	14140
South Atlantic	8294	44134	2703	55131	55081	56782
SUBTOTAL	8294	50686	2703	61683	61685	70922
Gulf Region						
East Gulf	1700	11577	15643	28928	29202	71112
Louisiana Gulf	8080	10022	433589	451691	452276	387502
North Texas Gulf	2197	6818		9015	8922	27491
South Texas Gulf				0	0	0
SUBTOTAL	11977	28417	449232	489626	490400	486105
Pacific Region						
Columbia River	0	2312		2312	2240	565
Puget Sound		15900	48	15948	16403	443
California				0	0	295
SUBTOTAL	0	18212	48	18260	18643	1303
Other	781	21119		21900	18188	NA
Total Receipts	50488	118599	451983	621150	617391	635774
Percentage of						
Total Receipts	8	19	73	100		
1977 Total Receipts	105055	145075	385644	635774	592839	
Percentage of						
Total Receipts	16	23	61	100		

^a Federal Grain Inspection Service.

^b Leath, Mack N., Lowell D. Hill and Steven W. Fuller. "Soybean Movements in the United States," NCRB Bulletin 273, SCS Bulletin 251, University of Illinois, Urbana/Champaign, Illinois, January 1981.

Table 6: Percent Distribution of Soybean Exports by Export Region and Mode of Transportation, 1985 and 1977

Export Region	<u>Percent of Exports</u>	
	1977	1985
Great Lakes	10	5
Atlantic	11	10
Gulf	77	79
Pacific	0.2	3
Other	NA	3
Total	100	100

Table 7: Interstate Shipments of Soybeans to Domestic Destinations and Export Ports for Each Region^a and Mode of Transportation, 1985, and Total 1977 Shipments by Region, U.S.

Regions	1985				1977 ^b
	Truck	Rail	Barge	Total	Total
(000,000 Bushels)					
Northeast	7.2	7.0	0	14.2	5.4 ^c
Lake States	18.1	34.5	51.0	103.6	61.9
Corn Belt	154.7	150.2	250.9	555.8	503.0
Northern & Southern Plains	69.7	57.3	1.8	128.8	39.1
Appalachia	60.0	33.0	66.0	159.0	66.6
Southeast	16.3	11.4	14.1	41.8	8.9 ^d
Delta	39.0	8.2	92.0	139.2	170.2
Mountain	3.0	0.7	0	3.7	0
Total	368.0	302.3	475.8	1,146.1	
Percentage of Total Shipments	32.0	26.0	42.0	100	
1977 Total Shipments	191.9	223.8	349.7	765.4	
Percentage of Total Shipments	25.1	29.2	45.7	100	

^a States included in each region are identified in Figure 5.

^b Leath, Mack N., Lowell D. Hill and Steven W. Fuller. "Soybean Movements in the United States", NCRR Bulletin 273, SCS Bulletin 251, University of Illinois, Urbana/Champaign, Illinois, January 1981.

^c Because of the aggregation process for the 1977 data, Delaware and Maryland were transferred from the Northeast region to the Appalachia region.

^d Because of the aggregation process for the 1977 data, Alabama was transferred from the Southeast region to the Appalachia region.

Table 8: Interstate Receipts of Soybeans at Domestic Destinations for Each Region^a And Mode of Transportation, 1985 and Total 1977 Receipts by Region, U.S.

Regions	1985				1977 ^b
	Truck	Rail	Barge	Total	Total
(000,000 Bushels)					
Northeast	31.1	19.6	.047	50.8	0 ^c
Lake States	8.1	6.7	0	14.8	21.4
Corn Belt	152.4	61.7	3.9	218.2	105.2
Northern & Southern Plains	44.6	14.4	0	59.0	25.9
Appalachia	48.8	28.7	12.4	90.0	73.6
Southeast	17.3	32.6	6.5	56.5	15.4 ^d
Delta	13.6	7.7	5.3	26.6	31.3
Mountain	0.1	0.7	0	0.8	0
Total	316.2	172.3	28.3	516.9	272.9
Percentage of total Receipts	61.2	33.3	5.5	100	100

^a States included in each region are identified in Figure 5.

^b Leath, Mack N., Lowell D. Hill and Steven W. Fuller. "Soybean Movements in the United States", NCRR Bulletin 273, SCS Bulletin 251, University of Illinois, Urbana/Champaign, Illinois, January 1981.

^c Because of the aggregation process for the 1977 data, Delaware and Maryland were transferred from the Northeast region to the Appalachia region.

^d Because of the aggregation process for the 1977 data, Alabama was transferred from the Southeast region to the Appalachia region.

Appendix Table 1: Soybean Shipments from the Northeast^a Area to Domestic Destinations and Export Ports, 1985

State	Truck	Rail	Barge	Total
	(000 Bushels)			
Delaware	4936	2802	0	7738
Maryland	639	362	0	1001
New England	34	2	0	36
New Jersey	19	100	0	119
New York	312	312	0	624
Ohio	389	0	0	389
Pennsylvania	728	2260	0	2988
Virginia	122	0	0	122
North Atlantic	0	1200	0	1200
Total	7179	7038	0	14217

^a Northeast includes Connecticut, Delaware, Maine, Maryland, New Jersey, Massachusetts, New Hampshire, New York, Pennsylvania, Rhode Island and Vermont

Appendix Table 2: Soybean Shipments from the Lake States^a to Domestic Destinations and Export Ports, 1985

State	Truck	Rail	Barge	Total
(000 Bushels)				
Georgia	0	118	0	118
Illinois	8712	2407	493	11612
Indiana	1005	657	0	1662
Iowa	4105	875	0	4980
Louisiana	0	0	505	505
Maryland	0	1914	0	1914
Minnesota	363	0	0	363
Missouri	0	192	0	192
Nebraska	0	954	0	954
N. Carolina	0	845	0	845
Ohio	873	679	0	1552
S. Carolina	0	653	0	653
S. Dakota	336	0	0	336
Tenn.	0	0	330	330
Texas	0	0	47	47
Virginia	0	700	0	700
Wisconsin	164	0	0	164
Chicago	105	0	0	105
Toledo	1553	0	0	1553
Saginaw	64	0	0	64
South Atlantic	0	10366	0	10366
East Gulf	0	2820	1000	3820
Louisiana Gulf	0	0	48587	48587
Columbia River	781	4570	0	5351
Puget Sound	0	6759	0	6759
Total	18061	34509	50962	103532

^a Lake States include Michigan, Minnesota and Wisconsin.

Appendix Table 3: Soybean Shipments from the Cornbelt^a to Domestic Destinations and Export Ports, 1985

State	Truck	Rail	Barge	Total
(000 Bushels)				
Alabama	693	6793	3046	10532
Arizona	0	200	0	200
Arkansas	565	1000	258	1823
Florida	0	75	0	75
Georgia	0	8858	0	8858
Illinois	50891	23824	1691	76406
Indiana	12105	1356	0	13461
Iowa	6526	66	0	6592
Kansas	7118	1262	0	8380
Kentucky	12513	7538	103	20154
Maryland	0	5311	0	5311
Michigan	17	0	0	17
Minnesota	2051	0	0	2051
Mississippi	0	3038	1323	4361
Missouri	12846	13655	292	26793
Nebraska	11005	922	0	11927
New York	100	66	0	166
N. Carolina	0	1618	0	1618
Ohio	10000	5705	0	15705
Penn.	0	1500	0	1500
S. Carolina	0	929	0	929
S. Dakota	21	0	0	21
Tenn.	300	3675	9978	13953
Texas	0	5667	47	5714
Virginia	0	6036	0	6036
Wisconsin	204	0	0	204
Chicago	2819	0	0	2819
Toledo	24895	165	0	25060
North Atlantic	0	6552	0	6552
South Atlantic	0	21389	0	21389
East Gulf	0	2400	8093	10493
Louisiana Gulf	0	7222	226034	233256
North Texas Gulf	0	3028	0	3028
Columbia River	0	1925	0	1925
Puget Sound	0	2529	0	2529
Mexico	0	5849	0	5849
Total	154669	150153	250865	555687

^a Corn Belt includes Illinois, Indiana, Iowa, Missouri and Ohio.

Appendix Table 4: Soybean Shipments from the Northern and Southern Plains^a to Domestic Destinations and Export Ports, 1985

State	Truck	Rail	Barge	Total
	(000 Bushels)			
Alabama	0	6122	46	6168
Arizona	0	385	0	386
Arkansas	42	2114	0	2156
Colorado	100	0	0	100
Georgia	0	1090	0	1090
Illinois	621	342	0	963
Indiana	0	190	0	190
Iowa	28044	250	0	28294
Kansas	12805	3295	0	16100
Kentucky	0	113	0	113
Minnesota	4949	6714	0	11663
Missouri	11700	18582	0	30282
Nebraska	8000	1068	0	9068
N. Dakota	850	317	0	1167
S. Dakota	430	0	0	430
Tenn.	0	1372	0	1372
Texas	6	1000	0	1006
Virginia	0	500	0	500
Louisiana Gulf	0	0	1757	1757
North Texas Gulf	2158	3105	0	5263
Columbia River	0	387	0	387
Puget Sound	0	7824	0	7824
Mexico	0	2500	0	2500
Total	69705	57270	1803	128778

^a Northern and Southern Plains includes Kansas, Nebraska, North Dakota, South Dakota, Oklahoma and Texas

Appendix Table 5: Soybean Shipments from Appalachia^a to Domestic Destinations and Export Ports, 1985

State	Truck	Rail	Barge	Total
(000 Bushels)				
Alabama	7997	5422	2484	15903
Delaware	2450	1000	0	3450
Georgia	170	1605	0	1775
Illinois	4600	650	1063	6313
Indiana	150	232	0	382
Kentucky	2308	113	0	2421
Louisiana	0	0	133	133
Maryland	20000	5380	47	25427
Mississippi	0	0	100	100
N. Carolina	300	264	0	564
Ohio	200	125	0	325
S. Carolina	2124	676	0	2800
Tenn.	3500	1792	1540	6832
Virginia	10500	2817	0	13317
South Atlantic	5666	10179	2703	18548
East Gulf	0	2797	1500	4297
Louisiana Gulf	0	0	56400	56400
Total	59965	33052	65970	158987

^a Appalachia includes Kentucky, North Carolina, Tennessee, Virginia and West Virginia.

Appendix Table 6: Soybean Shipments from the Southeastern^a United States to Domestic Destinations and Export Ports, 1985

State	Truck	Rail	Barge	Total
	(000 Bushels)			
Alabama	904	318	217	1439
Florida	0	118	0	118
Georgia	2223	4051	0	6274
Louisiana	0	0	991	991
Mississippi	85	974	559	1618
N. Carolina	2400	920	0	3320
S. Carolina	645	250	0	895
Tenn.	3330	1013	156	4499
South Atlantic	2628	2200	0	4828
East Gulf	4100	1560	6050	11710
Louisiana Gulf	0	0	6117	6117
Total	16,315	11404	14090	41809

^a Southeast includes Alabama, Florida, Georgia and South Carolina.

Appendix Table 7: Soybean Shipments from the Delta^a Region to Domestic Destinations and Export Ports, 1985

State	Truck	Rail	Barge	Total
	(000 Bushels)			
Alabama	735	2073	356	3164
Arkansas	2500	0	219	2719
California	0	388	0	388
Illinois	0	0	98	98
Louisiana	4860	0	0	4860
Mississippi	5550	0	660	6210
Missouri	24	0	43	67
Tenn.	15559	726	196	16481
Texas	1685	0	0	1685
East Gulf	0	2000	0	2000
Louisiana Gulf	8080	3050	90381	101511
North Texas Gulf	39	0	0	39
Mexico	0	0	48	48
Total	39032	8237	91953	139222

^a The Delta area includes Arkansas, Louisiana and Mississippi.

Appendix Table 8: Soybean Shipments from the Mountain Region^a to Domestic Destinations and Export Ports, 1985

State	Truck	Rail	Barge	Total
		(000 Bushels)		
Kansas	3,000	682	0	3,682
Total	3,000	682	0	3,682

^a Mountain Region includes Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah and Wyoming.

Appendix Table 9: Soybean Receipts at Domestic Destinations in the Northeastern^a United States from Reporting States, U.S., 1985

State	Truck	Rail	Barge	Total
	(000 Bushels)			
Indiana	0	4563	0	4563
Michigan	0	1914	0	1914
New Jersey	2400	0	0	2400
New York	267	404	0	671
N. Carolina	2000	6000	0	8000
Ohio	100	2984	0	3084
Penn.	5942	3364	0	9306
Virginia	20450	380	47	20877
Total	31159	19609	47	50815

^a Northeastern United States includes Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island and Vermont.

Appendix Table 10: Soybean Receipts at Domestic Destinations in the
Lake States^a from Reporting States, U.S., 1985

State	Truck	Rail	Barge	Total
(000 Bushels)				
Indiana	17	0	0	17
Iowa	2255	0	0	2255
Kentucky	204	0	0	204
Minnesota	164	0	0	164
Missouri	164	0	0	164
N. Dakota	3792	4617	0	8409
S. Dakota	1157	2097	0	3254
Wisconsin	363	0	0	363
Total	8116	6714	0	14830

^a Lake States includes Michigan, Minnesota and Wisconsin.

Appendix Table 11: Soybean Receipts at Domestic Destinations in the Cornbelt^a from Reporting States, U.S., 1985

State	Truck	Rail	Barge	Total
(000 Bushels)				
Arkansas	24	24	141	189
Illinois	21046	12183	292	33521
Indiana	29200	13872	105	43177
Iowa	12872	12703	895	26470
Kansas	2200	2200	0	4400
Kentucky	4950	817	1063	6830
Michigan	1904	2934	0	4838
Minnesota	4415	1368	400	6183
Missouri	24100	3400	706	28206
Nebraska	20665	9500	0	30165
New York	90	0	0	90
Ohio	5150	1639	291	7080
S. Dakota	17500	592	0	18092
Tenn.	0	190	0	190
Wisconsin	8376	316	93	8785
Total	152492	61738	3986	218216

^a Corn Belt includes Illinois, Indiana, Iowa, Missouri and Ohio

Appendix Table 12: Soybean Receipts at Domestic Destinations in the Northern and Southern Plains Area^a from Reporting States, U.S., 1985

State	Truck	Rail	Barge	Total
(000 Bushels)				
Arkansas	200	0	0	200
Iowa	979	1572	0	2551
Kansas	4006	1040	0	5046
Louisiana	1485	0	0	1485
Minnesota	336	954	0	1290
Missouri	17165	6279	0	23444
Nebraska	12209	2613	0	14822
N. Dakota	168	0	0	168
Oklahoma	3000	682	0	3682
S. Dakota	4856	1345	0	6201
Texas	170	0	0	170
Total	44574	14485	0	59059

^a Northern and Southern Plains Area includes Kansas, Nebraska, North Dakota, South Dakota, Oklahoma and Texas.

Appendix Table 13: Soybean Receipts at Domestic Destinations in Appalachia^a from Reporting States, U.S., 1985

State	Truck	Rail	Barge	Total
(000 Bushels)				
Alabama	1230	1013	156	2399
Arkansas	10509	300	0	10809
Georgia	2100	320	0	2420
Illinois	12	680	3900	4592
Indiana	7001	11112	3000	21113
Iowa	0	325	2641	2966
Kansas	0	1372	0	1372
Kentucky	3500	1292	1540	6332
Louisiana	0	0	196	196
Michigan	0	845	0	845
Minnesota	0	0	330	330
Mississippi	5050	426	0	5476
Missouri	0	0	508	508
N. Carolina	8600	2817	0	11417
Ohio	5800	6750	210	12760
S. Carolina	2400	600	0	3000
Tenn.	2308	613	0	2921
Virginia	300	264	0	564
Total	48810	28729	12481	90020

^a Appalachia includes Kentucky, North Carolina, Tennessee, Virginia and West Virginia.

Appendix Table 14: Soybean Receipts at Domestic Destinations in the Southeastern^a United States from Reporting States, U.S., 1985

State	Truck	Rail	Barge	Total
(000 Bushels)				
Alabama	0	1893	0	1893
Arkansas	158	0	0	158
Florida	280	1168	217	1665
Georgia	1222	686	0	1908
Illinois	173	2350	0	2523
Indiana	87	8700	0	8787
Iowa	0	901	3046	3947
Kentucky	1857	515	428	2800
Louisiana	0	0	247	247
Michigan	0	771	0	771
Mississippi	577	2073	109	2759
Missouri	433	593	357	1383
Nebraska	0	700	46	746
N. Carolina	4024	0	0	4024
N. Dakota	0	676	0	676
Ohio	0	4111	0	4111
S. Carolina	2270	990	0	3260
Tenn.	6310	6512	2056	14878
Total	17391	32639	6506	56536

^a Southeastern includes Alabama, Florida, Georgia and South Carolina.

Appendix Table 15: Soybean Receipts at Domestic Destinations in the Delta^a from Reporting States, U.S., 1985

State	Truck	Rail	Barge	Total
(000 Bushels)				
Alabama	85	220	461	766
Arkansas	6410	0	386	6796
Florida	0	0	1089	1089
Georgia	0	754	0	754
Illinois	0	440	442	882
Indiana	0	0	156	156
Iowa	272	3678	803	4753
Kansas	25	1114	0	1139
Kentucky	0	0	100	100
Louisiana	2000	0	442	2442
Michigan	0	0	505	505
Mississippi	4500	0	51	4551
Missouri	285	0	647	932
Nebraska	17	1000	0	1017
Ohio	0	0	180	180
Texas	0	512	0	512
Virginia	0	0	133	133
Total	13594	7718	5395	26707

^a The Delta includes Arkansas, Louisiana and Mississippi.

Appendix Table 16: Soybean Receipts at Domestic Destinations in the Mountain Region^a from Reporting States, U.S., 1985

State	Truck	Rail	Barge	Total
	(000 Bushels)			
Illinois	0	200	0	200
Kansas	0	385	0	385
Nebraska	100	0	0	100
Texas	0	130	0	130
Total	100	715	0	815

^a Mountain Region includes Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah and Wyoming.