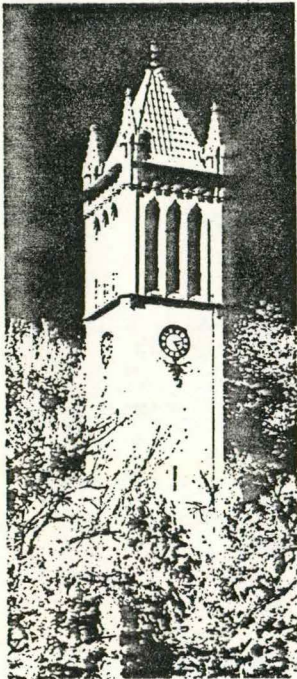


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# **Transportation of Grain and Mixed Feeds From Iowa**

by W. H. Thompson



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**Department of Industrial Administration**

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## SUMMARY

1. Data (for 1962-65) covering shipments of corn, soybeans and feed were furnished by 45 grain handling firms and 25 feed manufacturers located in Iowa. They recorded 10 million tons of corn, 6.5 million tons of soybeans and almost 2 million tons of mixed feed shipped from Iowa during the 3 years.

2. The volume of corn shipped to other states increased from 2.8 million tons in 1962-63 to 4.3 million tons in 1964-65. Four states accounted for 80 percent of the tonnage shipped from Iowa during the 3 years. The most important market was Illinois, followed by Louisiana, Nebraska and Missouri.

3. Railroads carried the highest percentage of corn over the 3 years, but their share of the traffic declined in each of the 3 years. Barges ranked second in importance, carrying an increasingly larger volume each year, whereas trucks and truck-barge combinations showed neither percentage gain nor loss.

4. Soybeans were shipped to fewer states than was corn. Almost 70 percent of the movements seemed destined for export through the Illinois and Louisiana ports.

5. Louisiana showed the greatest percentage increase in receipts of Iowa soybeans, with Illinois and Tennessee ranking next.

6. The greatest rate of increase in the soybean traffic was in barge movements. Railroads, trucks and truck-barge combinations showed increases over the period, but each mode had a declining share of the traffic for each of the 3 years.

7. Mixed feed was hauled by railroads and trucks to states predominantly contiguous to Iowa. Two-thirds of the tonnage was carried in trucks to markets in states closest to Iowa, whereas the one-third of the traffic carried by railroads was moved to a larger number of states more distant from the Iowa origins.

8. The traditional railroad grain rate structure has gradually eroded under the impact of "exempt" motor and water-carrier competition. Both motor and water carriers showed weighted average costs that were lower than those of the railroads on all movements.

9. The Iowa shippers surveyed spent about \$54

million for corn, \$9 million for soybeans and \$10 million for mixed feed shipments from Iowa during the period.

10. The heaviest volume of corn and soybeans moved during the fourth quarter of each of the years studied, whereas the lowest percentage moved during the third quarter of each year. Mixed feed movements were fairly uniform throughout the 4 quarters of each year.

11. The major transportation problem reported by the respondents related to the shortage of transportation equipment. Lack of adequate railroad cars was the most important factor, but shortages were also indicated in truck and barge equipment.

12. Some shippers suggested that "inferior railroad service" was as important a problem as equipment shortage, particularly the poor condition of cars and delays in transit.

13. Railroad grain rates to meet the competition of motor and water carriers were reduced in a variety of ways. Some were reduced only on export movements, others to domestic markets and still others on a nontransit basis. The pressure for rate changes on mixed feeds did not appear as severe as that on grain movements.

14. The trend in railroad grain rates is toward a "bare bones" type of rate, generally predicated upon the use of large covered hopper cars in multiple lots. These new rate structures will affect the future of the country elevator unless the elevator can participate in the multiple car rates.

15. Iowa is at a rate disadvantage on corn movements to the West Coast when competing against Nebraska, South Dakota and Minnesota. From western Iowa points there is a rate disadvantage to the Gulf when competing with Minnesota points.

16. Most grain handling firms did not own or lease truck transportation equipment. They shipped in trucks owned by buyers, by contract carriers and by itinerant haulers. Mixed-feed manufacturers used owned or leased truck equipment on a larger scale than the grain firms.

17. The weighted average per-mile costs of operating motor vehicles were 31 cents, 33 cents and 31 cents, respectively, for each of the study years.

# Transportation of Grain and Mixed Feeds From Iowa<sup>1</sup>

by W. H. Thompson

Marketing farm products is increasingly important in our expanding national economy; marketing costs often influence consumer food prices more than does the price of the commodity on the farm. As the marketing functions expand, these costs become a primary force in the distribution of farm commodities.

Basic to the marketing function is transportation, and agricultural interests are concerned about moving and the costs of moving farm commodities into both domestic and foreign markets. Iowa's shippers are especially concerned because of the state's geographical location relative to the high density populated markets of the nation. Iowa's farm products in the raw and processed stages move long distances to consumers throughout the United States and commodities to foreign markets are shipped thousands of miles through the Great Lakes gateways to the St. Lawrence Seaway or through export ports on the East and West Coasts and Gulf of Mexico. Often Iowa must compete for these markets with other states, producing similar products, located much closer to domestic markets and export ports.

Changes in the techniques of producing and harvesting farm commodities, coupled with technological advances in transportation, have necessitated improved arrangements for distributing farm commodities among markets. Competition for agricultural traffic among and between the modes of transportation has caused ever-changing patterns of rates, charges and services. Larger and better-designed equipment and higher standards of service are required if shippers are to reach markets for the lowest possible cost. In many instances, availability of equipment is as important as the charges made for using the equipment, especially during Iowa's peak harvesting periods.

Currently, railroads, motor carriers and barges separately and in combination compete intensively for Iowa's agricultural traffic. The state is served by 10 Class I railroads that offer piggyback service; no point in the state is more than 13.6 miles from a rail line. Approximately 4,000 highway contract and 8,000 common carriers, plus the many thousands of privately owned and operated trucks, offer service within the state, and over 1,000 interstate carriers are registered by the Interstate Commerce Commis-

sion. These trucks operate on 11,500 miles of paved highways and use portions of three interstate systems that bisect the state in a north-south and east-west direction. Water transportation is available on the Missouri River, with a 6-foot channel, and on the Mississippi River, with a 9-foot channel.<sup>2</sup>

## Method of Research

To evaluate the transportation factors in marketing Iowa's farm products, a research study was initiated in July 1965, sponsored by the Iowa Agricultural Marketing Division and Iowa State University. Data for three general commodity groups covering 1962-65 were requested from shippers, shipper organizations, carriers and state and federal agencies. These commodity groups included corn, soybeans and mixed feeds; livestock and meats; and poultry and products. For each group, the research attempted to:

- (a) evaluate the transportation method used in the movements,
- (b) determine the markets into which the commodities moved,
- (c) calculate the charges,
- (d) compare and contrast the per ton costs by each type of carrier and
- (e) study the seasonal factors.

Data were collected by personal visits to shippers, shipper associations and carriers. Conferences were held with executives and traffic personnel on the transportation problems they encountered. A minimum of 5 man-days was spent at each firm. Movement data were compiled on a state-to-state basis, assuming that each state was a major market for Iowa shippers. No data was collected on the intrastate movement of the commodities. Because of the complexity of the project, it seemed most practical to first collect and compile data on corn, soybeans and mixed feeds. Therefore, this report concerns the transportation of these products from Iowa.

A total of 45 grain handling firms and 25 manufacturers of mixed feeds furnished data for the study. These firms shipped 10 million tons of corn, 6.5 million tons of soybeans and almost 2 million tons of mixed feeds during 1962-65. We estimated that the data included about 50 percent of the corn

<sup>1</sup>Project No. 1254 of the Iowa Agriculture and Home Economics Experiment Station.

<sup>2</sup>Data furnished by the Iowa Development Commission, Des Moines, Iowa.

and 80 percent of the soybeans sold during the 3 years after the tonnage moving intrastate and processed in the state was deducted.<sup>3</sup>

### Corn Movements

The volume of corn shipments to other states increased from 2.8 million tons for the 12-month period commencing July 1, 1962, to 4.3 million tons for the 12-month period ending July 1, 1965 (table 1). Four states accounted for 80 percent of the Iowa shipments, the most important being Illinois, followed by Louisiana, Nebraska and Missouri. However, the largest percentage increase was in the movements to Louisiana. Shipments to Illinois and Louisiana were presumed destined for export trade and those to Nebraska and Missouri for both domestic and foreign markets.

The flow pattern of the corn movements to each state is shown in fig. 1, and the type of transportation used is shown in tables 2-6. Railroads carried the highest percentage of corn for the 3 years, but showed a declining percentage of the total volume

<sup>3</sup>For example, the following statistics for the 1964 crop year in Iowa were reported by the U. S. Department of Agriculture, Statistical Reporting Service, Crop Reporting Board:

Corn production	21.1 Million Tons
Feed and seed on farms	12.4 Million Tons
Sold	8.7 Million Tons
Processed (estimated)	1.5 Million Tons
Shipped	7.2 Million Tons
Volume in study	4.3 Million Tons

shipped in each year. On the other hand, barges ranked second in importance for the period, with an increasingly higher percentage hauled in each of the 3 years. Highway carriers and truck-barge movements maintained their shares of the traffic. The rail-barge movements were too small to be significant.<sup>4</sup>

In 5 of the 10 states included in table 3, the railroads had increases in traffic. Except for the shipments to Washington, the movement to the West Coast declined; in the opinion of shippers, this was because these states could get corn substitutes from closer origins at lower freight rates. The decline in the southern flow could be attributed to expanding barge movements.

Movements of corn by truck increased to all states listed in table 4. The highest percentage increases were made in the shipments to states contiguous to Iowa; viz., Nebraska, Missouri, Minnesota and Illi-

<sup>4</sup>Even though the interstate truck movement of corn is shown as 14 percent of the total shipped for each of the 3 years, the volumes hauled increased each year. The U. S. Department of Agriculture also reported trends in the North Central region; trucks accounted for 40.8 percent of the grain shipped from country elevators in 1963—up 10.5 percent from the 30.3 percent carried in 1958; barge shipments increased by 50 percent in the same period, and rail shipments dropped 11.2 percentage points from 68.3 percent in 1958 to 57.1 percent in 1963. Bruce Wright, Changes in Transportation Used by Country Grain Elevators in the North Central Region, 1958-1963. Marketing Research Report No. 724, AMS, U. S. Dept. Agr. 1965.

Table 1. Corn movements from Iowa.

To:	1962-63		1963-64		1964-65		1962-65		% Change 1962-65
	Tons	%	Tons	%	Tons	%	Tons	%	
Illinois	788,998	28	925,605	30	1,073,148	25	2,787,787	27	+ 36
Nebraska	645,820	23	491,486	16	799,708	19	1,937,014	19	+ 24
Louisiana	450,678	15	665,883	21	1,209,805	28	2,326,366	23	+168
Missouri	340,908	12	376,455	12	422,053	10	1,159,416	11	+ 24
California	121,912	4	138,236	4	108,836	2	368,984	4	- 11
Washington	110,964	4	94,472	3	139,692	3	345,128	3	+ 26
Minnesota	101,752	4	65,492	2	179,004	4	346,248	3	+ 75
Wisconsin	87,159	3	144,813	5	159,768	4	391,740	4	+ 83
Oregon	64,512	2	54,712	2	52,892	1	172,116	2	- 18
Texas	46,472	2	41,496	1	34,720	1	123,088	1	- 26
Arkansas	35,616	1	49,868	2	24,584	—	110,068	1	- 31
Tennessee	26,171	1	18,993	—	24,426	—	69,590	—	- 6
Other*	29,503	1	75,512	2	79,537	3	184,552	2	+169
Totals	2,850,865	100	3,124,030	100	4,308,209	100	10,283,104	100	+ 51

\*Less than 1 percent of total movement to each state.

Table 2. Distribution of corn movements from Iowa by type of media.

Media	1962-63		1963-64		1964-65		1962-65		% Change 1962-65
	Tons	%	Tons	%	Tons	%	Tons	%	
Railroad	2,034,861	71	2,022,824	65	2,440,049	57	6,497,734	63	+ 20
Truck	386,820	14	438,889	14	619,136	14	1,444,845	14	+ 60
Barge	281,792	10	512,512	16	1,085,448	25	1,879,752	18	+285
Truck-Barge	143,612	5	147,285	5	162,316	4	453,213	4	+ 13
Rail-Barge	3,780	—	2,520	—	1,260	—	7,560	1	- 66
Totals	2,850,865	100	3,124,030	100	4,308,209	100	10,283,104	100	+ 51

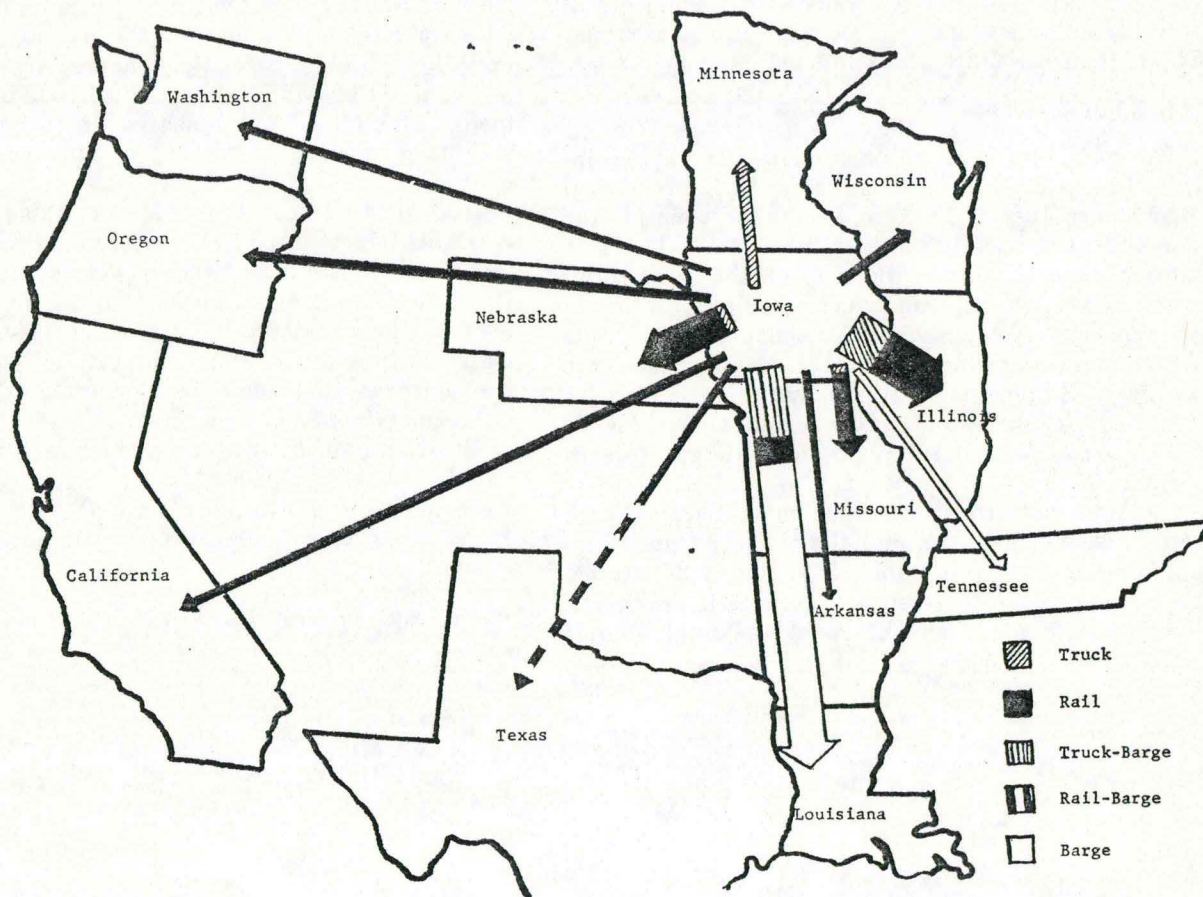


Fig. 1. Corn movements from Iowa.

Table 3. Distribution of corn movements from Iowa by railroad.

To:	1962-63		1963-64		1964-65		1962-65		% Change 1962-65
	Tons	%	Tons	%	Tons	%	Tons	%	
Illinois	544,194	27	612,341	30	745,640	31	1,902,175	29	+ 37
Nebraska	624,344	31	466,393	23	722,512	30	1,813,249	28	+ 16
Missouri	327,720	16	351,529	17	384,569	16	1,063,818	16	+ 17
California	121,772	6	138,236	7	108,836	4	368,884	6	- 11
Washington	110,964	6	94,472	5	139,692	6	345,128	5	+ 26
Wisconsin	87,159	4	144,253	7	159,768	7	391,180	6	+ 83
Louisiana	79,884	4	55,608	3	53,032	2	188,524	3	- 33
Oregon	64,512	3	54,712	3	52,892	2	172,116	2	- 18
Arkansas	31,192	1	43,456	2	21,448	1	96,096	1	- 31
Texas	22,428	1	19,488	1	10,528	—	52,444	1	- 53
Other*	20,692	1	42,336	2	41,132	1	104,160	3	+ 98
Totals	2,034,861	100	2,022,824	100	2,440,049	100	6,497,734	100	+ 20

\*Less than 1 percent of total movement to each state.

nois. These vehicles may haul corn and soybeans in for-hire interstate transportation under the so-called agricultural exemption, subject to the regulations of Section 203 (b) (6) of the Interstate Commerce Act. It provides that the movement of unprocessed or non-manufactured agricultural commodities shall be exempt from economic regulation "if such motor vehicles are not used in carrying any other property or passengers for compensation." Grain may also be carried under a water-carrier exemption according to Section 303 (b) of the Act. It allows an exemption from economic regulation if the vessel cargo space is used for transporting not more than three bulk commodities.<sup>5</sup>

No other carrier enjoyed the gains in corn traffic that barges did, especially those to Louisiana, over

<sup>5</sup>The motor and water carrier "exemptions" have been the subject of widespread debate for many years. It is not the purpose of this report to examine the pros and cons of the argument but only to emphasize that motor and water carriers when operating under the "exemption" need not publish their rates and charges and, therefore, can negotiate the price of each shipment. Railroads do not have this privilege. See D. P. Locklin, *Economics of Transportation*, 6th Ed. Richard D. Irwin, Co., Homewood, Illinois, 1966; Charles Taff, *Commercial Motor Transportation*, Richard D. Irwin, Co., Homewood, Illinois, 1961; Celia Sperling, *The Agricultural Exemption in Interstate Trucking*, Marketing Research Report No. 188, AMS, U. S. Dept. Agr. July 1957.

the 3 years. Table 5 indicates the spectacular increase that occurred, not only on the Louisiana movement, but also to a lesser extent, on the Mississippi shipments. Whether or not movements to Missouri will continue is not known since the data covered only the one year. Notable in a declining shipment pattern were the shipments to Tennessee, in the past an important market for corn and soybeans as feed ingredients for the southeastern poultry industry. It is possible that the Southern Railroad "Big John" freight-rate reduction on grain has affected the barge movements of corn into the Tennessee River ports.<sup>6</sup> Relatively little movement by truck-barge and rail combinations was found, except to Louisiana.

Table 6 summarizes the traffic into each of the major states of destination for the 3 years by type of transportation. Railroads dominated the traffic to the West Coast and to some states bordering Iowa. Truck movements were shorter, and the southern flow of corn was carried primarily by barge or by some combination with barges.

<sup>6</sup>I & S Docket Number 7656. Grain in Multiple Car Shipments—River Crossings to the South. 318 ICC 641; 321 ICC 582.

Table 4. Distribution of corn movements from Iowa by truck.

To:	1962-63		1963-64		1964-65		1962-65		% Change 1962-65
	Tons	%	Tons	%	Tons	%	Tons	%	
Illinois	244,804	63	313,264	71	327,544	53	885,612	61	+ 34
Minnesota	97,552	25	63,952	15	169,764	27	331,268	23	+ 74
Nebraska	21,476	7	25,093	6	77,196	12	123,765	9	+259
Missouri	13,188	3	24,814	6	35,672	6	73,674	5	+170
Arkansas	4,424	1	5,046	1	—	—	9,470	1	—
Colorado	4,256	1	4,732	1	5,242	1	14,230	1	+ 23
Other*	1,120	—	1,988	—	3,718	1	6,826	—	+232
Totals	386,820	100	438,889	100	619,136	100	1,444,845	100	+ 60

\*Less than 1 percent of total movement to each state.

Table 5. Distribution of corn movements from Iowa by barge and combination media.

To:	1962-63	1963-64	1964-65	1962-65	% Change 1962-65
	Tons	Tons	Tons	Tons	
Louisiana <sup>1</sup>	254,408	487,536	1,026,424	1,768,368	+303
Louisiana <sup>2</sup>	112,606	120,219	129,089	361,914	+ 15
Louisiana <sup>3</sup>	3,780	2,520	1,260	7,560	— 66
Texas <sup>2</sup>	23,800	21,000	23,576	68,376	— 01
Missouri <sup>1</sup>	—	112	21,812	21,924	—
Arkansas <sup>1</sup>	—	1,680	—	1,680	—
Tennessee <sup>1</sup>	22,568	15,960	19,600	58,128	— 13
Tennessee <sup>2</sup>	3,603	3,033	4,826	11,462	+ 40
Mississippi <sup>1</sup>	4,816	5,824	10,612	21,252	+120
Mississippi <sup>2</sup>	3,603	3,033	4,825	11,461	+ 47
Alabama <sup>1</sup>	—	1,400	7,000	8,400	—
Totals	429,184	662,317	1,249,024	2,340,525	+191

<sup>1</sup>Barge

<sup>2</sup>Truck-Barge Combination

<sup>3</sup>Rail-Barge Combination

## Soybean Movements

Soybeans were shipped to fewer states than was corn (table 7), and almost 70 percent of the total volume was probably destined for export through the Louisiana and Illinois ports. The huge percentage increase in the movement to Louisiana indicates the importance of the Gulf ports in export trade for Iowa.<sup>7</sup> Soybean traffic to each state listed increased over the 3 years.

Although each carrier increased its volume of soybeans in 1962-65, railroads handled a declining percentage of the total shipped in each of the 3 years. Trucks experienced a similar pattern, but barges carried a higher percentage of the volume moved each year (table 8 and fig. 2). The carriers appeared to divide soybean traffic much more readily than they did corn traffic.

Tables 9-11 show the distribution of tonnage carried by railroads, trucks and barges. Railroads had

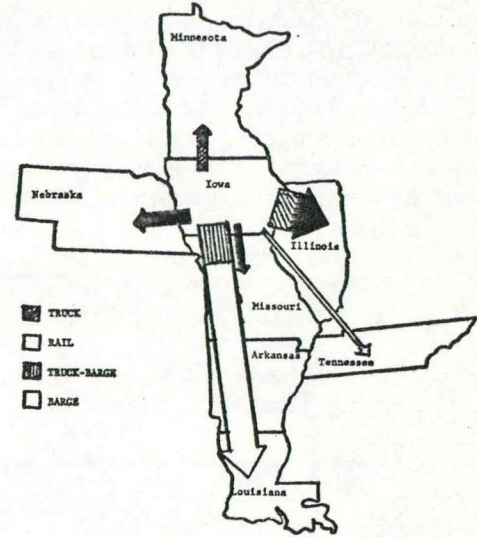


Fig. 2. Soybean movements from Iowa.

<sup>7</sup>As this report is written there is a proposal to increase tolls on grain moving over the St. Lawrence Seaway by 10 percent.

Table 6. Corn movements from Iowa to major states by type of media, 1962-63.

To:	Railroad		Truck		Barge		Truck-Barge		Rail-Barge		Total Tons
	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	
Illinois	1,902,175	68	885,612	23							2,787,787
Nebraska	1,813,249	94	123,765	06							1,937,014
Missouri	1,063,818	92	73,674	06	21,924	02					1,159,416
California	368,844	100	140	—							368,984
Washington	345,128	100									345,128
Wisconsin	391,180	100	560	—							391,740
Louisiana	188,524	08			1,768,368	76	361,914	15	7,560	01	2,326,366
Oregon	172,116	100									172,116
Arkansas	96,096	87	12,292	11	1,680	02					110,068
Minnesota	14,980	04	331,268	96							346,248
Colorado	21,336	60	14,230	40							35,566
Texas	52,444	43	2,263	01			68,376	56			123,088
Tennessee					58,128	84	11,462	06			69,590
Mississippi					21,252	65	11,461	35			32,713
Alabama	1,820	18			8,400	82					10,220
Other*	67,984	98	1,036	02							69,020
Totals	6,499,734		1,444,845		1,879,752		453,213		7,560		10,283,104

\*Less than 1 percent of total movement to each state.

Table 7. Soybean movements from Iowa.

To:	1962-63		1963-64		1964-65		1962-65		% Change 1962-65
	Tons	%	Tons	%	Tons	%	Tons	%	
Illinois	152,490	40	276,310	43	359,550	36	788,350	39	+136
Louisiana	64,560	17	157,560	24	363,090	37	585,210	29	+462
Nebraska	62,010	16	81,690	13	100,140	10	243,840	12	+ 61
Minnesota	59,790	16	72,270	11	72,240	7	204,300	10	+ 21
Missouri	24,960	7	32,190	5	43,740	5	100,890	5	+ 75
Tennessee	9,510	3	19,800	3	20,550	2	49,860	3	+116
Other*	3,048	1	9,252	1	27,960	3	41,260	2	+817
Totals	376,368	100	649,072	100	987,270	100	2,012,710	100	+162

\*Less than 1 percent to each state.



their greatest gains in distributing soybeans into Illinois; trucks distributed most into Minnesota and Nebraska, and barges distributed most into Louisiana and Tennessee. The summary of soybean traffic to all states by type of transportation for the period (table 12) shows the advantages of railroads to 7 states, trucks to 1 state, and barges to the remaining 3 states.

#### Mixed Feed Movements

Mixed feed traffic was hauled by railroads and trucks, predominantly to states contiguous to Iowa (table 13). Trucks hauled approximately two-thirds of the tonnage in each of the 3 years (table 14). Railroad movements covered a larger range of states and were destined to the more distant states, whereas the shorter distance shipments were handled primarily

Table 8. Distribution of soybean movements from Iowa by type of media.

Media	1962-63		1963-64		1964-65		1962-65		% Change 1962-65
	Tons	%	Tons	%	Tons	%	Tons	%	
Railroad -----	193,860	51	303,780	47	438,750	44	936,390	47	+126
Truck -----	108,438	29	165,412	25	164,880	17	438,730	22	+ 52
Barge -----	51,100	14	152,610	24	345,630	35	551,340	27	+576
Truck-Barge -----	20,978	6	27,270	4	38,010	4	86,250	4	+ 81
Totals -----	376,368	100	649,072	100	987,270	100	2,012,710	100	+162

Table 9. Distribution of soybean movements from Iowa by railroad.

To:	1962-63		1963-64		1964-65		1962-65		% Change 1962-65
	Tons	%	Tons	%	Tons	%	Tons	%	
Illinois -----	65,520	34	157,560	52	253,740	58	476,820	51	+287
Nebraska -----	60,360	31	78,930	26	95,400	22	234,690	25	+ 58
Minnesota -----	39,990	21	28,830	9	18,300	4	87,120	9	- 55
Missouri -----	24,960	13	32,190	11	43,740	10	100,890	11	+ 75
Other* -----	3,030	1	6,270	2	27,570	6	36,870	4	+810
Totals -----	193,860	100	303,780	100	438,750	100	936,390	100	+126

\*Less than 1 percent to each state.

Table 10. Distribution of soybean movements from Iowa by truck.

To:	1962-63		1963-64		1964-65		1962-65		% Change 1962-65
	Tons	%	Tons	%	Tons	%	Tons	%	
Illinois -----	86,970	80	118,750	72	105,810	64	311,530	71	+ 22
Minnesota -----	19,800	18	43,440	26	53,940	33	117,180	27	+172
Nebraska -----	1,650	2	2,760	2	4,740	3	9,150	2	+187
Other* -----	18	—	462	—	390	—	870	—	+2067
Totals -----	108,438	100	165,412	100	164,880	100	438,730	100	+ 53

\*Less than 1 percent to each state.

Table 11. Distribution of soybean movements from Iowa by barge and combination media.

To:	1962-63		1963-64		1964-65		1962-65		% Change 1962-65
	Tons		Tons		Tons		Tons		
Louisiana <sup>1</sup> -----	43,590		130,290		325,080		498,960		+646
Louisiana <sup>2</sup> -----	20,970		27,270		38,010		86,250		+ 81
Tennessee <sup>1</sup> -----	9,510		19,800		20,550		49,860		+116
Other* -----			2,520				2,520		—
Totals -----	74,070		179,880		383,640		637,590		+418

<sup>1</sup>Barge

<sup>2</sup>Truck-Barge Combination

\*Less than 1 percent to each state.

ly by trucks (table 15 and 16). Most of the truck movements were into the states closest to Iowa, and 4 states received all their mixed feed by railroad (table 17).

#### Rates and Charges

The volume and direction of corn and soybean shipments from Iowa depend primarily upon rates, charges and services offered by the carriers. As mentioned previously, motor and water carriers when qualified to haul these commodities as "exempt" movements are not required to publish

their rates. Railroads do not enjoy similar "exemptions," but must meet the rate competition of the "exempt carriers." Grain shippers have probably suffered more confusion in recent years about rates, services and available equipment than shippers of any other commodity in this nation.

For many years, but particularly before intense competition developed between railroads, trucks and barges, grains were carried almost exclusively by the railroads. Their rate structure was based upon three important considerations. One was the flow of traffic in a west-east direction; this has since been diverted

Table 12. Soybean movements to major states from Iowa by type of media, 1962-65.

To:	Railroad		Truck		Barge		Truck-Barge		Total
	Tons	%	Tons	%	Tons	%	Tons	%	
Illinois	476,820	60	311,530	40					788,350
Nebraska	234,690	96	9,150	04					243,840
Missouri	100,890	99	390	—	1,020	01			102,300
Minnesota	87,120	43	117,180	57					204,300
Kansas	10,650	100							10,650
California	6,030	100							6,030
Wisconsin	15,450	100							15,450
Arkansas	3,000	100							3,000
Louisiana					498,960	85	86,250	15	585,210
Tennessee					49,860	100			49,860
Mississippi					1,500	100			1,500
Other*	1,740	78	480	22					2,220
Totals	936,390		438,730		551,340		86,250		2,012,710

\*Less than 1 percent to each state.

Table 13. Mixed feed movements from Iowa.

To:	1962-63		1963-64		1964-65		1962-65		% Change 1962-65
	Tons	%	Tons	%	Tons	%	Tons	%	
Nebraska	120,013	21	120,402	20	118,710	21	359,125	20	— .02
Illinois	95,092	16	105,941	18	92,364	16	293,397	17	— .03
S. Dakota	75,219	13	77,085	13	79,237	14	231,541	13	+ .05
Minnesota	66,908	12	72,107	12	76,338	13	215,353	13	+ .14
Wisconsin	65,011	11	63,443	11	54,278	9	182,732	10	— .17
Missouri	41,081	7	49,131	8	40,981	7	131,193	7	—
Texas	21,470	4	19,879	3	19,172	3	60,521	3	— 10
Michigan	10,512	2	11,657	2	11,592	2	33,761	2	+ 10
Kansas	9,918	2	8,879	2	8,471	2	27,268	2	— 14
Ohio	8,076	1	8,153	1	8,108	1	24,337	1	—
Oklahoma	6,063	1	6,280	1	6,391	1	18,734	1	+ .05
Louisiana	5,925	1	6,137	1	6,246	1	18,308	1	+ .05
New York	5,650	1	5,851	1	5,955	1	17,456	1	+ .05
Other*	46,532	8	49,893	7	51,403	9	147,828	9	+ 10
Totals	577,470	100	604,838	100	579,246	100	1,761,554	100	—

\*Less than 1 percent of total movement to each state.

Table 14. Distribution of mixed feeds from Iowa by type of media.

By:	1962-63		1963-64		1964-65		1962-65		% Change 1962-65
	Tons	%	Tons	%	Tons	%	Tons	%	
Railroad	202,251	35	224,774	37	196,175	34	623,200	35	— 03
Truck	375,219	65	380,064	63	383,071	66	1,138,354	65	+ 02
Totals	577,470	100	604,838	100	579,246	100	1,761,554	100	—

Table 15. Distribution of mixed feeds from Iowa by railroad.

To:	1962-63		1963-64		1964-65		1962-65		% Change 1962-65
	Tons	%	Tons	%	Tons	%	Tons	%	
Illinois	38,326	20	48,002	21	23,370	12	109,698	18	— 39
Missouri	22,024	11	26,988	12	24,138	12	73,150	11	10
Texas	21,470	11	19,879	9	19,172	10	60,521	10	— 11
Wisconsin	19,674	10	21,859	10	19,973	10	61,506	10	—
Nebraska	9,156	6	10,977	5	10,141	5	30,274	5	11
Michigan	7,352	3	8,551	4	8,594	5	24,497	4	17
Kansas	7,390	3	7,656	3	7,459	4	22,505	4	01
Minnesota	6,757	3	8,895	4	9,801	5	25,453	4	45
Oklahoma	6,063	3	6,280	3	6,491	3	18,734	3	05
Louisiana	5,925	3	6,137	3	6,246	3	18,308	3	05
New York	5,650	3	5,851	3	5,955	3	17,456	3	05
Arkansas	4,961	2	5,138	2	5,229	3	15,328	2	05
Ohio	4,916	2	5,047	2	5,110	3	15,073	2	04
Colorado	4,139	2	4,036	2	4,067	2	12,242	2	— 02
S. Dakota	4,062	2	3,620	2	4,430	2	12,112	2	09
Pennsylvania	3,859	2	3,996	2	4,067	2	11,992	2	05
California	3,032	1	3,140	1	3,195	2	9,367	2	.05
Tennessee	2,894	1	2,997	1	3,050	1	8,941	1	.05
Delaware	2,480	1	2,569	1	2,614	1	7,663	1	.05
N. Carolina	2,343	1	2,426	1	2,469	1	7,238	1	.05
New Jersey	2,205	1	2,283	1	2,324	1	6,812	1	.05
Washington	2,067	1	2,141	1	2,179	1	6,387	1	05
Other*	15,506	8	16,306	7	16,201	8	48,013	8	.04
Totals	202,251	100	224,774	100	196,175	99	623,200	100	— 03

\*Less than 1 percent of total movement to each state.

Table 16. Distribution of mixed feed from Iowa by truck.

To:	1962-63		1963-64		1964-65		1962-65		% Change 1962-65
	Tons	%	Tons	%	Tons	%	Tons	%	
Nebraska	110,857	30	109,425	29	108,569	28	326,851	29	— 02
S. Dakota	71,157	19	73,465	19	74,807	20	219,429	19	.05
Minnesota	60,651	16	63,212	17	66,537	18	190,400	17	10
Illinois	56,766	15	57,939	15	68,994	18	183,699	16	222
Wisconsin	45,337	12	41,584	11	34,305	9	121,226	11	— 24
Missouri	19,057	5	22,143	6	16,843	4	58,043	5	— 11
Other*	11,394	3	12,296	3	13,016	3	36,706	3	14
Totals	375,219	100	380,064	100	383,071	100	1,138,354	100	.02

\*Less than 1 percent of total movement to each state.

Table 17. Mixed feed movements from Iowa to major states by type of media, 1962-65.

To:	Railroad		Truck		Total
	Tons	%	Tons	%	
Nebraska	30,274	8	328,851	92	359,125
Illinois	109,698	37	183,699	63	293,397
S. Dakota	12,112	5	219,429	95	231,541
Minnesota	24,953	12	190,400	88	215,353
Wisconsin	61,506	34	121,226	66	182,732
Missouri	73,150	56	58,043	44	131,193
Texas	60,521	100	—	—	60,521
Michigan	24,497	73	9,264	27	33,761
Kansas	22,505	83	4,763	17	27,268
Ohio	15,073	62	9,264	38	24,337
Oklahoma	18,734	100	—	—	18,734
Louisiana	18,308	100	—	—	18,308
New York	17,456	100	—	—	17,456
Other*	134,413	91	13,415	9	147,828
Totals	623,200		1,138,354		1,761,554

\*Less than 1 percent of total movement to each state.

somewhat by the development of newer markets and competition among carriers moving in a north-south pattern. Another factor was the attempt to equalize broad producing and consuming areas, which allowed for equal rates for unequal distances, currently modified by the trend toward point-to-point rates by all carriers. The third factor was the transit privilege that gave the shipper the opportunity to store, mix, blend or process grain between producing and consuming points without additional freight charges. Currently, there are pressures for the reduction in or elimination of transit through the establishment of volume incentive rates published for large carloads or minimum trainload weights.

This rate structure made possible a relatively orderly pricing system on the marketing of grain and grain products. It was the basis for rate parity between the grains and grain-product movements. Prices in the producing areas were based on terminal market prices minus inbound freight charges. Risk was minimized as a factor in pricing because of the influence of transportation costs on plant location.

The impact of competition between carriers on the "traditional grain rate structure" has resulted in marked differences in the charges for the same commodity moving equal distances via different modes of transportation to the same destination. Grains shipped to many different destinations and the variability of grain prices make establishing price levels at country points difficult. Railroads attempt to meet the competition of exempt and private motor and water carriers by reducing rates on grains without equivalent adjustments on the nonexempt processed agricultural products.

The gradual erosion of rate parity that once existed between raw grains and grain products may be seen in the current movements of wheat and flour from the Midwest to eastern and southeastern states. In May 1963, the Southern Railroad put into operation 100-ton grain cars as contrasted to the older 50-ton cars and were able to get a rate reduction of 60 percent from conventional rates on grains. They are now testing a 109-foot articulated hopper car with a 248-ton capacity. As a result, it has been alleged by one shipper that rates on flour are as much as 427 percent of wheat rates.<sup>8</sup>

Iowa is not a major shipper of wheat and flour, but the 1963 grain rate adjustment could have an impact on its livestock and meat processing industry. In the two years following the date of the "Big John" rate reductions, the Southern Railroad reported the following activity in livestock and meat processing on its lines. In the 4-state deficit meat-producing area, North Carolina, South Carolina, Georgia and Alabama, facility changes included 23 new feed mills, 41 feed mills expanded, 35 new cattle

feedlots, 16 new hog feedlots, 17 cattle feedlots expanded, 11 packing houses expanded and 2 new packing houses.<sup>9</sup>

To present the costs of moving the grains and mixed feeds from Iowa, we computed expenditures from each origin in Iowa to each destination in the other states. The volumes moved between these points were then divided into the expenditures to arrive at a weighted per-ton average cost. These charges, shown for the 3-year period only, are a composite of all movement charges from Iowa into each of the states.

The 45 grain handling firms who furnished data for this report spent over \$54 million to move corn during 1962-65. The largest share was paid to railroads, followed by barges, trucks and truck-barge combinations. The distribution of total expenditures for shipping corn for each year and the total for all 3 years is given in table 18.

Weighted average costs for the corn movements by type of carrier to each state are found in table 19.

<sup>9</sup>Traffic World, June 5, 1965, p. 20: A preliminary analysis of the problem has been made by W. H. McPherson. Relationship between Cost of Transporting Livestock Products between Surplus and Deficit Feed Grain Producing Areas. Research Project No. 1162. Florida Agricultural Experiment Station. 1965 Research is under way at present by the Iowa State University and the Iowa Agricultural Marketing Division on livestock and meat movements from Iowa. The problem is also being studied by the 12-state Governors' Transportation Committee, in which the author of this report is the vice-chairman of the research subcommittee.

Table 18. Total charges for shipping corn from Iowa by type of media, 1962-65.

Media	1962-63	1963-64	1964-65	Total 1962-65
Railroad	\$13,773,539	\$13,131,220	\$10,931,192	\$37,835,951
Truck	1,519,375	1,775,282	2,280,256	5,574,913
Barge	1,130,164	2,039,619	4,287,044	7,456,827
Truck-Barge	1,062,738	1,101,400	1,182,896	3,347,034
Totals	\$17,485,816	\$18,047,521	\$18,681,388	\$54,214,725

Table 19. Average costs of shipping corn from Iowa by type of media, 1962-65.

To:	Railroad	Truck	Barge <sup>1</sup>	Combination <sup>2</sup>
(dollars per ton)				
Illinois	6.68	4.33	—	—
Nebraska	2.83	2.30	—	—
Missouri	6.00	3.82	1.58	—
California	16.00	—	—	—
Washington	16.00	—	—	—
Wisconsin	6.30	—	—	—
Louisiana	7.62	—	3.99	7.20
Oregon	16.00	—	—	—
Arkansas	6.74	7.73	5.85	—
Texas	7.71	—	—	8.08
Minnesota	4.44	2.90	—	—
Colorado	7.56	5.67	—	—
Tennessee	—	—	3.54	6.61
Mississippi	—	—	5.05	4.97
Alabama	—	—	4.06	—

<sup>8</sup>Traffic World, October 8, 1966, p. 67. The complaint is docketed as #34785. H. C. Milling Company v. Atlantic Coast Line Railroad Co. et al.

<sup>1</sup>From river ports only  
<sup>2</sup>Truck-Barge

Table 20. Total charges for shipping soybeans from Iowa by type of media, 1962-65.

Media	1962-63	1963-64	1964-65	Total 1962-65
(in dollars)				
Railroad	862,827	1,461,981	2,357,748	4,682,556
Truck	427,546	641,876	597,045	1,666,467
Barge	217,293	615,910	1,512,099	2,345,302
Combination	167,475	215,985	298,548	682,008
Totals	1,675,141	2,935,752	4,765,440	9,376,333

Table 21. Average costs of shipping soybeans from Iowa by type of media, 1962-65.

To:	Railroad	Truck	Barge <sup>1</sup>	Combination <sup>2</sup>
(dollars per ton)				
Illinois	6.26	4.31	—	—
Minnesota	3.23	2.57	—	—
Missouri	5.07	3.60	1.60	—
Kansas	5.31	—	—	—
Nebraska	2.42	1.96	—	—
California	16.51	—	—	—
Wisconsin	5.35	—	—	—
Arkansas	7.00	—	—	—
Louisiana	—	—	4.35	7.90
Tennessee	—	—	3.80	—
Mississippi	—	—	6.94	—

<sup>1</sup>From river ports only

<sup>2</sup>Truck-Barge

Table 23. Average costs of shipping mixed feeds from Iowa by type of media, 1962-65.

To:	Railroad	Truck
(dollars per ton)		
Illinois	3.13	3.57
Wisconsin	3.65	2.68
Missouri	4.04	4.65
Ohio	12.77	19.85
Nebraska	3.25	4.18
Minnesota	6.34	3.71
S. Dakota	3.36	—
Arkansas	11.72	—
California	22.94	—
Colorado	11.59	—
Delaware	14.00	—
Georgia	10.94	—
Kansas	6.85	5.30
Louisiana	9.40	—
Michigan	8.98	—
New York	14.15	—
Oklahoma	9.58	—
Texas	10.00	—
Washington	22.94	—

Table 22. Total charges for shipping mixed feeds from Iowa by type of transportation, 1962-65.

	1962-63	1963-64	1964-65	Total 1962-65
(in dollars)				
Railroad	1,555,013	1,649,780	1,566,251	4,771,044
Truck	1,611,051	1,665,532	1,695,202	4,971,785
Totals	3,166,064	3,315,312	3,261,453	9,742,829

Rail charges to Illinois consisted primarily of export rates, which ranged from 24 to 34 cents per 100 pounds. Except for higher charges to Arkansas, trucks had the advantage that should be expected on "exempt" movements. Charges for barge services are shown on a port-to-port basis; and where combination truck-barge charges were available for comparison with railroad charges, they were relatively competitive.

Transportation of soybeans cost over \$9 million, as shown in table 20. Average costs of the movements by truck and barge were lower than those by railroads (table 21).

Mixed feed was carried by only two types of carriers as shown in tables 22 and 23. The movement by railroad was more widespread than that by truck, with data on truck charges found primarily for movements to states contiguous to Iowa. Total charges for shipping mixed feeds from 25 firms were almost \$10 million.

These figures should not be used as exact rates or charges between the states because they are composed of many factors and should be read only as comparisons between the modes of transportation over the period. Some of the components used in arriving at the figures included backhaul charges, switching and terminal expenses, and transfer costs in addition to actual rates. Distance or average mileage was not used as a measure of the charges because of competitive influences between the various carriers. Some of the rates obtained disregarded distance and were published on a point-to-point basis. Others were subject to almost daily changes by exempt carriers. And still others were export rates that were lower than domestic rates.

### Seasonality of Movements

Table 24 shows the seasonality of corn, soybean and mixed feed shipments during each quarter of the 3-year period. The heaviest volume of both corn and soybeans moved during the 4th quarter of each year, with soybean movements showing a higher percentage than corn shipments. The lowest percentages were found in the 3rd-quarter movements. By contrast, the mixed feed movements were fairly uniform throughout the 4 quarters, which would reflect the demand for feed used by livestock and the over-all supply of feedstuffs from local production at the destination.

Table 24. Seasonal movements of corn, soybeans and mixed feeds (in percentage).

Quarter	1962-63	1963-64		1964-65
		Corn		
Jan-Feb-Mar	25.6	25.7	23.3	
Apr-May-June	24.8	24.7	32.0	
July-Aug-Sept	17.5	17.1	19.5	
Oct-Nov-Dec	32.1	32.5	35.2	
		Soybeans		
Jan-Feb-Mar	17.8	21.4	16.2	
Apr-May-June	19.6	24.2	31.7	
July-Aug-Sept	7.9	8.8	12.3	
Oct-Nov-Dec	54.7	45.6	39.8	
		Mixed Feeds		
Jan-Feb-Mar	27.2	27.2	26.9	
Apr-May-June	23.2	23.3	23.2	
July-Aug-Sept	22.4	22.1	22.7	
Oct-Nov-Dec	27.2	27.4	27.2	

### Major Transportation Problems

Personnel of the firms handling grains and mixed feeds were asked to comment on the major problems encountered in transporting their commodities during their fiscal year 1964-65. These included:

- difficulty in obtaining an adequate supply of railroad cars, trucks and barges,
- significant changes in rates and charges,
- trends in the use of larger equipment and
- trends in the use of privately owned or leased equipment.

#### Transportation Equipment

The major transportation problem mentioned related to the shortage of equipment. Except where the firms owned the equipment, over 80 percent reported that they had difficulty in obtaining railroad cars. Almost 25 percent indicated a problem in obtaining trucks, and a few reported difficulties in obtaining barges in April and November, usually the opening and closing months of navigation on the Missouri and Mississippi rivers.<sup>10</sup>

However, the question of "inferior service" was, in the opinion of the shippers, almost as important as the shortage of equipment. Most of the complaints stressed the poor condition of the railroad cars when received, the delays in transit, poor tracing service, bunching of cars for loading, lack of dependability of trucks, embargoes on roads in the spring, lack of proper scheduling of shipments and slow delivery to customers after arrival at terminals.

<sup>10</sup>The railroad car shortage has received considerable publicity during the past few years and is often indicated as the major transportation problem facing shippers. Not only is this matter acute in the grain-producing regions, but is beginning to be serious in movements of nonagricultural commodities. In an attempt to make freight car supply more adequate, Congress passed the so-called freight per-diem bill on May 17, 1966. It allows the Interstate Commerce Commission to adjust the compensation by one railroad for the use of its equipment by other railroads to include an incentive element if the supply of a particular type of car is inadequate. See *Traffic World*, May 21, 1966, p. 7 and May 28, 1966, p. 17.

### Changes in Railroad Rates

To meet competition of motor and water carriers, railroad grain rates were reduced in a variety of ways. Lower export rates were published on corn and soybeans. Reductions to Duluth, Milwaukee and Chicago averaged 3 to 5 cents per cwt., 7½ cents per cwt. to the Gulf ports, and from 10-14 cents per cwt. for export movements via West Coast ports. Rates into Colorado fell 5 cents per cwt., and some nontransit rates were made effective on eastern shipments.

By contrast, few shippers of mixed feeds reported significant changes in railroad rates. Costs of transporting soybean meal to the West Coast were reduced by \$2.80 per ton; some transit privileges were lost, which meant that total charges may have increased, and two shippers indicated a reduction by the use of higher volume minimums. Generally, the pressure for rate reductions did not seem as severe for mixed feeds as for grains because (a) there was no water carrier competition and (b) the mixed feed traffic did not qualify as exempt movements by motor vehicle. The trend in railroad rate making is toward a "bare bones" type of rate, generally predicated on the use of large covered hopper cars in multiple lots. This type of rate usually does not include provisions for storage or milling in transit, stops for inspection, indirect routing or existing time allowances for loading and unloading.<sup>11</sup> The unit-train multiple-car rate concept has spread rapidly west of the Mississippi River since the Southern Railroad's "Big John" grain rate case.<sup>12</sup> At least two recent proposals have been made for train load rates from points in Iowa to the Gulf, one with a minimum of 75 cars of 100 tons and the other with 50 cars of 100 tons. Each proposal was designed to meet the barge competition on the Missouri and Mississippi rivers.<sup>13</sup>

It seems evident that the new rail rate structures will work against the flow of grain from farm to country elevator to terminal elevator since the multiple car rates require large originations of grain—probably larger than the average country elevator can provide. Continued abandonment of branch lines on which small country elevators are located, together with the new rate structure, raises serious problems for grain handling firms. Country eleva-

<sup>11</sup>Transit privileges are arrangements that permit the stopping of carload lots for commercial processing or storage without incurring a freight-rate penalty. They are used extensively in the grain-milling trade and are subject to the through rate in effect on articles in their finished form from origin to destination via the transit point. For example, an inbound rate to a transit point on grain is 70 cents per cwt., and the outbound rate to destination on grain products is 50 cents per cwt. Between origin and destination, a through rate may be published as \$1.10 per cwt. on products. By subtracting the 70-cent inbound rate from \$1.10, the transit balance is 40 cents, rather than the outbound charge of 50 cents. For a discussion on transit privileges see Kenneth U. Flood, *Traffic Management*, William C. Brown Co., Dubuque, Iowa, 1963, chapter 11.

<sup>12</sup>*Ibid.*, p. 16.

<sup>13</sup>Grain and mixed feed shippers were using hopper cars ranging from 50 to 100 tons to transport outbound movements of grain and feed and inbound movements of feed ingredients. At least one shipper reported multiple car shipments at rates based upon 5,000 tons on one bill of lading.

tors may be bypassed in favor of large direct transfer houses built on the main railroad lines from which grain can move directly to export ports or domestic markets. The future of small country elevators depends upon the possibility of participation in the multiple car rates that require originating a minimum of 500 tons or more, either through a truck-rail combination or by the publication of single car assembly rates in combination with the rates for multiple car lots.

Iowa shippers, in general, are aware of these trends. They are disturbed by the frequent rate changes that interfere with merchandising because of the inability of their personnel to stay abreast of such changes. They believe that piecemeal rate reductions rearrange or destroy existing market relationships through the use of rates that bypass country and terminal elevators. And they are concerned about the changing competitive position of the elevators, especially when elevators are located on railroad lines that do not participate in all the rate reductions.

Iowa is at a rate disadvantage on corn movements to the West Coast when competing against Nebraska, South Dakota and Minnesota for these markets. Between Iowa and Nebraska origins there is as much as a 35 cent per cwt. difference on traffic to the West Coast. From western Iowa points, rates to the Gulf are too high to compete successfully with Minneapolis and St. Paul. The railroad rate on grain from St. Louis into the Southeast is \$4.00 per ton for 500 miles of service. By comparison, the domestic rate from Des Moines to Chicago, a distance of approximately 320 miles is \$6.20 per ton for corn and \$6.40 per ton for soybeans. The consensus of those surveyed indicated that the railroad rate structure was preventing Iowa grain shippers from reaching wider markets.

#### Other Transportation Problems

In commenting on problems other than equipment, rates and service, shippers mentioned a problem relating to seasonality; namely, that high-moisture corn picked during the peak harvesting season could not be stored adequately and elevators and transportation facilities were jammed. Other problems mentioned included the difficulties in scheduling truck movements, losses of grain shipped in box cars and barges, and the changing rate relationship between grains and grain products processed in Iowa.<sup>14</sup> With regard

<sup>14</sup>J. E. Rickenbacker and W. H. Thompson. *Losses in Transporting and Handling Grain by Selected Grain Marketing Cooperatives*. F. C. S., Marketing Research Report No. 766, U. S. Dept. Agr. 1966.

to the latter observation, the discussion centered on the impact of rate reductions on grain without corresponding reduction on processed products, including livestock.

#### Privately Owned Motor Vehicles

Most grain handling firms did not own or lease truck transport equipment. The service was hired through a variety of arrangements from the use of trucks furnished by buyers, contract hauler and itinerant truckers.<sup>15</sup> No common carriers were listed. Back-haul carriers were used when available because of the advantage in their charges. Where leased vehicles were used, the lessee provided the equipment and driver.

Mixed feed companies used owned or leased truck equipment more often than did the grain handling firms. Both common and contract carriers were also used, however; but few, if any, itinerant carriers were involved. Where leased equipment was used, the feed manufacturers furnished the drivers and paid their wages. It appeared that mixed feed was carried in far more regulated motor carriers than were grain shipments.

Reasons for using and owning motor vehicles by both groups of shippers included the following:

1. need for fast service to customers;
2. abandonment of branch lines service by railroads;
3. lower charges on truck haul and for the combination of truck-barge movements;
4. better control of equipment and service (Trucks take from 1 to 2 days for delivery as compared with 5 to 8 days delivery time by railroads.);
5. service to customers not on or near a railroad; and
6. no switching problems.

Costs of operating motor vehicles ranged from 22 to 39 cents per mile for 1962-63, 25 to 47 cents per mile for 1963-64 and the same for 1964-65. Weighted average per mile costs—weighted by the tonnage hauled—were 31 cents, 33 cents and 31 cents for each of the 3 years.

<sup>15</sup>Itinerant truckers have long been associated with the so-called grey area of motor carrier operations. They are quite prominent in grain hauling, sometimes known as "gypsies," "buy and sell operators" or "merchant truckers" selling for-hire transportation and operating on both intra- and interstate movements, but are not regulated by states or federal agencies with regard to rates and services. After 2 years of deliberation, Congress in 1965 passed PL 89-170, a statute designed to curb unlawful interstate trucking operations. See W. H. Thompson. "Expected Developments in Transportation Legislation and Implications to Agriculture." In: *Proceedings of the Workshop on Transportation*. University of Nebraska Press, Lincoln, Nebraska, 1966.

**APPENDIX**



APPENDIX

Date \_\_\_\_\_ Interviewer \_\_\_\_\_ CONFIDENTIAL

IOWA STATE UNIVERSITY OF SCIENCE AND TECHNOLOGY

Ames, Iowa

Transportation of Corn, Soybeans and Mixed Feeds to Markets Out of State (Iowa).

Name of Shipper, Association or Carrier \_\_\_\_\_

Location \_\_\_\_\_

Name and Title of Person Interviewed \_\_\_\_\_

L. How many bushels (tons) of the following did you ship out of state during your last three completed years?  
 Fiscal year ends \_\_\_\_\_

	<u>1962</u>	<u>1963</u>	<u>1964</u>
Corn	_____	_____	_____
Soybeans	_____	_____	_____
Mixed Feeds	_____	_____	_____

2. How much of the corn moved out of state by

Rail	_____	_____	_____
Truck	_____	_____	_____
Barge	_____	_____	_____
Combination (identify)	_____	_____	_____

3. How much of the soybeans moved out of state by

Rail	_____	_____	_____
Truck	_____	_____	_____
Barge	_____	_____	_____
Combination (identify)	_____	_____	_____

4. How much of the mixed feeds moved out of state by

Rail	_____	_____	_____
Truck	_____	_____	_____
Barge	_____	_____	_____
Combination (identify)	_____	_____	_____

5. Approximately where did the out-of-state commodities go and how much to each place? What were the representative rates and mileage? (Use the attached worksheets)  
 (a) Corn.                      (b) Soybeans.                      (c) Mixed Feeds.

6. Have you experienced difficulty in obtaining an adequate supply of railroad cars, trucks, or barges to haul your commodities during the past year? If yes, explain.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

7. Have railroad rates been changed on movements of your commodities to principal markets during the past year? If yes, give examples.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

8. What are your major problems in transportation of your commodities? List in order of importance. \_\_\_\_\_  
 \_\_\_\_\_

9. Has there been a trend towards the use of individual larger railroad cars or multiple carloads? Explain. \_\_\_\_\_  
 \_\_\_\_\_

10. Do you own or lease trucks? \_\_\_\_\_ Explain your trucking arrangements. \_\_\_\_\_  
 \_\_\_\_\_

11. Cost of operating your own motortrucks (over-the-road trucks, only).

	<u>1962</u>	<u>1963</u>	<u>1964</u>
Number of trucks operated	_____	_____	_____
Average size of capacity	_____	_____	_____
Total miles operated	_____	_____	_____
Total tons hauled	_____	_____	_____
Operating costs:			
Wages and Salaries	_____	_____	_____
Gas, Oil, & Lubrication	_____	_____	_____
Repairs	_____	_____	_____
Tires & Tire Repair	_____	_____	_____
Depreciation	_____	_____	_____
Insurance	_____	_____	_____
Licenses & Fees	_____	_____	_____
Other: (list)	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
Total Operating Cost	_____	_____	_____

12. What are your reasons for operating motortrucks? \_\_\_\_\_  
 \_\_\_\_\_

13. What percentage of your out-of-state shipments of corn were during

	<u>1962</u>	<u>1963</u>	<u>1964</u>
Jan.-Feb.-March	_____	_____	_____
Apr.-May -June	_____	_____	_____
July-Aug.-September	_____	_____	_____
Oct.-Nov.-December	_____	_____	_____

14. What percentage of your out-of-state shipments on soybeans were during

	<u>1962</u>	<u>1963</u>	<u>1964</u>
Jan.-Feb.-March	_____	_____	_____
Apr.-May -June	_____	_____	_____
July-Aug.-September	_____	_____	_____
Oct.-Nov.-December	_____	_____	_____

15. What percentage of your out-of-state shipments of mixed feed were during

	<u>1962</u>	<u>1963</u>	<u>1964</u>
Jan.-Feb.-March	_____	_____	_____
Apr.-May -June	_____	_____	_____
July-Aug.-September	_____	_____	_____
Oct.-Nov.-December	_____	_____	_____