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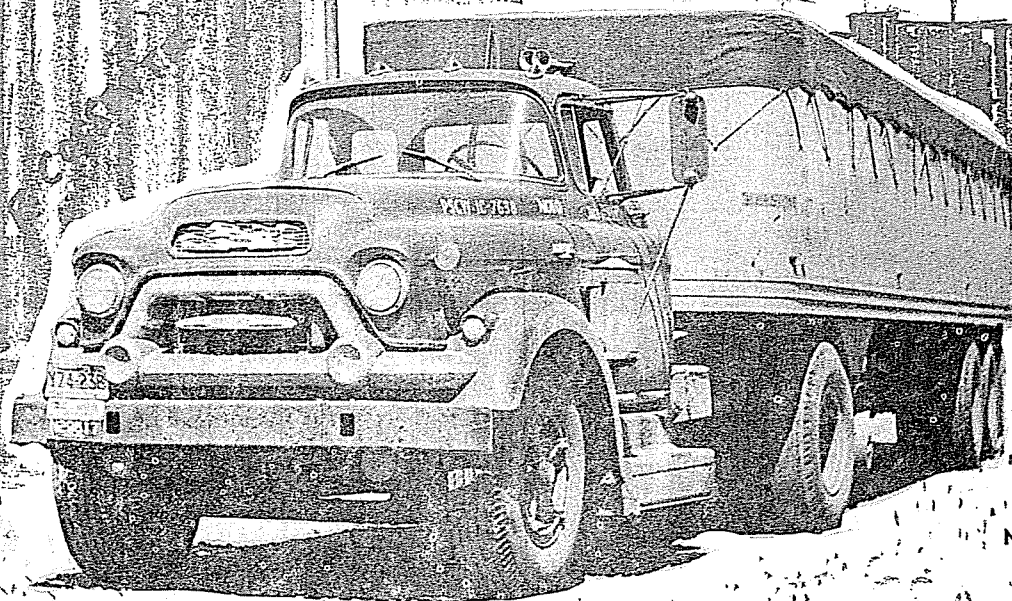
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Truck Shipment of Grain by North Dakota Elevators 1957-58

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TRUCK SHIPMENT OF GRAIN BY NORTH DAKOTA ELEVATORS, 1957-58

By Fred R. Taylor and David C. Nelson ^{1/}

INTRODUCTION

This is a second report by the Department of Agricultural Economics on truck shipment of grain from North Dakota country elevators. The first report, May 1959, reported the 1956-57 crop. This report covers the 1957-58 crop.

North Dakota is one of the leading states in the production and marketing of grain. In 1958, North Dakota ranked first in the production of durum wheat, spring wheat, barley, rye and flax. The state ranked fifth in the total acreage of the principal crops harvested, including corn. In 1958, cash receipts from farm marketings of crops accounted for approximately 67 percent of the North Dakota cash farm income from farm marketings.

Most of the grain produced in North Dakota is moved to terminal markets located in other states for sale and processing. In recent years, there has been a gradual shift from the traditional method of shipping North Dakota grain by rail to shipment by truck. It was estimated that approximately 5 percent of the 1956-57 crop was trucked as compared to over 7 percent of the 1957-58 crop. These trends present problems to the entire grain trade. If the trend continues, it may change the location, type of facilities, equipment for handling grain, and methods of selling and financing grain shipment.

The advantages that truckers have over rail are significant in that they have caused this shift. The fact that truckers engaged in the transportation of certain agricultural commodities are exempt from regulation by the Interstate Commerce Commission has enabled them to procure the grain traffic largely through significant reductions in rates. Other important factors contributing to the shift are less time in transit by truck, less handling of the commodity, the demand of truckers for backhauls to terminal markets, and the shortage of box cars during harvest.

With the opening of the St. Lawrence Seaway ports as markets, an additional factor becomes important in this shift. Shippers no longer will have to rely on rail export rates and transit privileges to reduce their expense margin. The combined truck and ocean vessel rate should be competitive with whatever rates the railroads set up as a result of the opening of the seaway.

These factors are very important in the marketing of grains for they dictate necessary adjustments in methods of loading and subsequent short run introductory costs. If the trend continues, trucks will demand these more efficient operations and their demands will be justified. Relocations of historic grain handling industries and facilitating agencies may be necessary. Already begun, decentralization of handlers and particularly processors may be accelerated.

^{1/}Professor, Department of Agricultural Economics and Project Assistant, respectively.

Much investigation is necessary, of course, before definite conclusions can be drawn. Additional studies may indicate different trends. Studies in this area have been limited, however, and it is for this reason the Department of Agricultural Economics of the North Dakota Agricultural College, in cooperation with other states of the North Central Region is making this study of trends in the movement of grain by truck. This study is a part of the North Central Regional Marketing Project NCM-19, "Pricing and Trading Practices for Grain in the North Central Regions."

Source of Data

Data for this study were obtained from a mail survey of all known elevator firms in North Dakota. Eight hundred fifty questionnaires were mailed. Three hundred thirty-two, approximately 39 percent, were returned. Of those returned, 288, approximately 34 percent of the total mailed and 87 percent of the total returned were usable. The estimates in this report are based on the usable returned questionnaires.

The elevators were asked to furnish information for the period October 1, 1957 through September 30, 1958. Each elevator reporting furnished information concerning the amount of grains purchased from farmers or from CCC, how much was moved out of state and the respective destinations. They were also asked to report the amount of grain trucked that was sold at elevator or sold at destination. In each instance, this data was stratified by (1) grain sold at elevator to truckers with or without a return haul, or (2) grain sold at destination and shipped in trucks with or without a return haul. In addition to this data, elevator operators were asked to report their best possible estimate of the truck freight rates on individual grains from their station to the most common destination. Other questions pertaining to elevator operators feelings toward the trucking trend were asked.

Analysis Procedure

In order to provide areas of production with similar characteristics, the nine crop reporting districts of the state were used for stratification purposes. Figure 1 shows these districts and the number of questionnaires mailed and number received for 1956-57 and 1957-58.

The number of elevators in each reporting district were then grouped into classes by volume of grain purchased. Ratio estimators were developed for each volume class based on the number of questionnaires mailed and the number returned. The volumes of elevators in each district were estimated from North Dakota Public Service Commission Statistics for the year 1955. Those elevators not now in existence were eliminated from the total sampling population. This method assumes that those not reporting purchased approximately the same amount of grain in 1957 as in 1955 and 1956. The data reported was then expanded into estimated totals for each crop reporting district. Table 1 shows the volume classes and ratio estimators for each crop reporting district.

NORTH DAKOTA

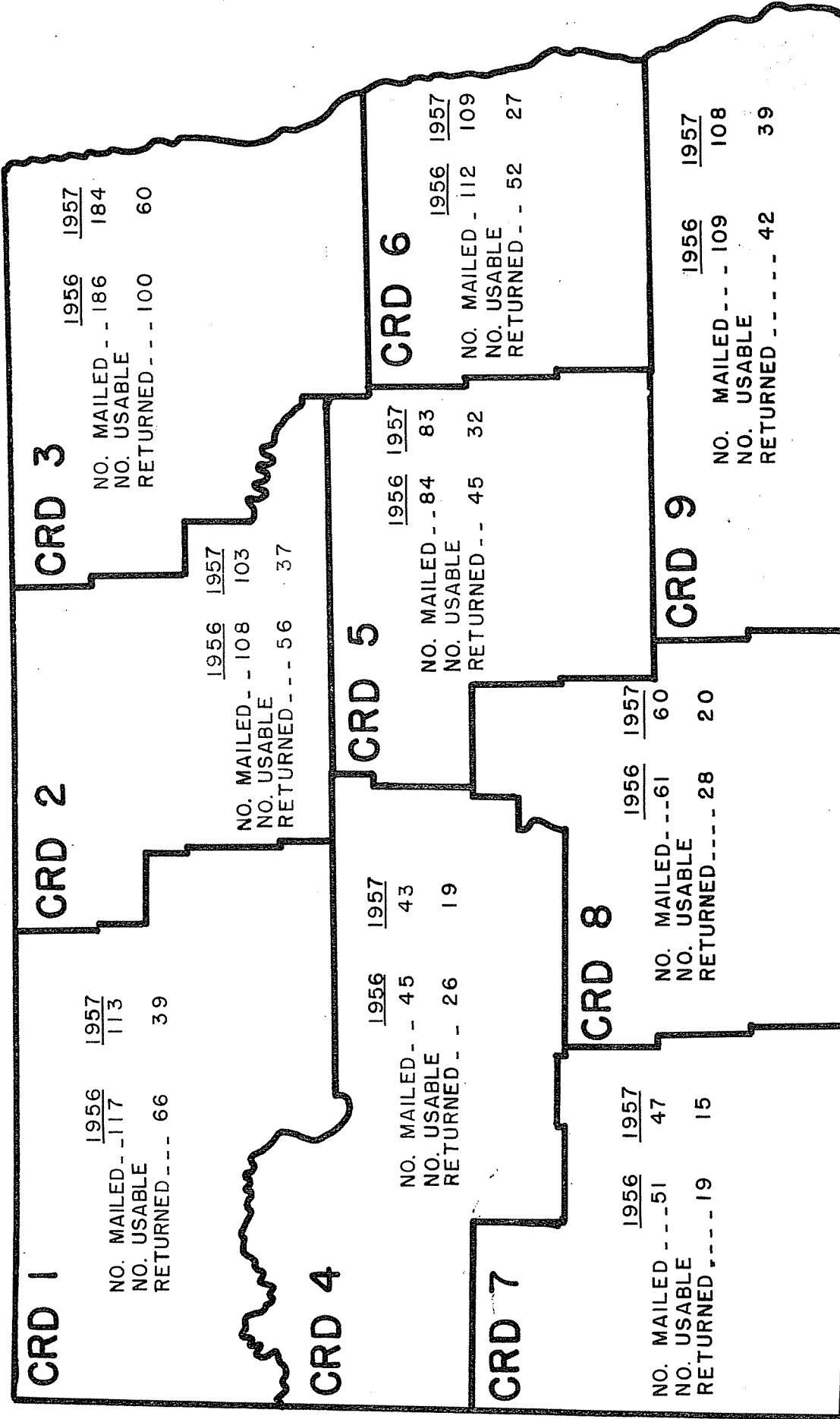


FIGURE 1. NORTH DAKOTA CROP REPORTING DISTRICTS, NUMBER OF QUESTIONNAIRES MAILED AND NUMBER OF USABLE QUESTIONNAIRES RETURNED.

	1956	1957
NUMBER MAILED	873	850
NUMBER USABLE	434	288
PERCENT	50	34

TABLE 1. NUMBER OF QUESTIONNAIRES MAILED, BY VOLUME OF GRAIN PURCHASED, NUMBER RETURNED AND RATIO ESTIMATORS BY CROP REPORTING DISTRICT.

VOLUME 1,000 bu.	CROP REPORTING DISTRICTS																	
	1	2	3	4	5	6	7	8	9									
	NM/NR	RE	NM/NR	RE	NM/NR	RE	NM/NR	RE	NM/NR	RE	NM/NR	RE	NM/NR	RE	NM/NR	RE	NM/NR	RE
0-199	43/22	1.954	61/24	2.542	104/23	4.522	19/10	1.900	38/16	2.375	60/8	7.500	24/5	4.800	41/13	3.155	73/15	4.867
200-399	47/10	4.700	29/10	2.900	58/23	2.522	18/4	4.500	35/9	3.889	31/11	2.818	18/5	3.600	16/6	2.667	30/19	1.576
400-599	14/4	3.500	11/2	5.500	14/6	2.333	5/1	5.000	8/7	1.143	10/3	3.333	1/1	1.000	3/0	0	4/4	1.000
600-	9/3	3.000	2/1	2.000	8/8	1.000	1/1	1.000	2/0	0	8/5	1.800	4/4	1.000	0/0	0	1/1	1/000

NM = NUMBER OF QUESTIONNAIRES MAILED

NR = NUMBER OF USABLE QUESTIONNAIRES RETURNED

RE = RATIO ESTIMATOR

Comparison of Volume Produced and Estimated
Volume Purchased by Elevators

North Dakota farmers produced a total of 309,330,000 bushels of grain in 1957.^{2/} Of this amount, it was estimated that 196,752,131 bushels or approximately 64 percent were purchased by elevators. The residuals were either fed to livestock, retained for seed purposes, sold to other farmers, or stored on the farm for future sale. (Table 2).

TABLE 2. GRAIN PRODUCED, ESTIMATED ELEVATOR PURCHASES AND GRAIN NOT SOLD, 1957-58.

	Wheat	Barley	Oats	Corn	Flax	Rye	Soybeans
	Thousands of Bushels						
Produced							
1956	118,824	74,952	47,878	31,872	26,672	3,768	2,301
1957	118,144	75,207	58,688	34,528	15,124	4,235	3,404
Purchased							
1956	104,267	47,625	16,973	2,551	17,297	2,862	1,453
1957	104,228	54,950	16,153	1,046	14,358	2,666	2,044
Not Sold							
1956	14,557	27,327	30,905	29,291	9,375	906	848
1957	13,916	20,257	42,535	33,482	766	1,569	1,360

The 1957 crop year includes the period October 1, 1957 to September 30, 1958. Of all grain purchased, approximately 53 percent was wheat, 28 percent barley, 8 percent oats and 7 percent flax, with the other grains accounting for less than 4 percent of all grain purchases.

ESTIMATED GRAIN PURCHASED AND TRUCKED

All Grains

North Dakota country elevators purchased an estimated 196,752,131 bushels of grain from farmers and the CCC during the 1957 crop year. Of this total, an estimated 14,125,669 bushels were shipped by truck to first destination from the country elevators.

^{2/}North Dakota Crop and Livestock Statistics, 1958 North Dakota Crop and Livestock Reporting Service, April 1959.

For the 1956 crop year, Crop Reporting District 9 ranked first with about 24 percent of the total grain purchased trucked. Crop Reporting District 6 ranked first with 24 percent of the total grain trucked for the 1957 crop year (Table 3).

TABLE 3. CROP REPORTING DISTRICTS RANKED BY PERCENT OF TOTAL GRAINS TRUCKED, 1956 and 1957.

CROP REPORTING DISTRICTS AND PERCENT TRUCKED				
Rank Position	1956 Crop ^{1/}		1957 Crop	
	CRD	Percent	CRD	Percent
1	9	24.3	6	24.0
2	6	22.3	1	20.7
3	3	14.4	3	14.1
4	7	9.5	9	13.9
5	1	9.2	7	8.5
6	8	7.1	5	8.4
7	5	5.7	4	4.9
8	4	4.9	8	3.8
9	2	2.6	2	1.7

^{1/}Taylor, F. R. and Nelson, D. C., "Truck Shipment of Grain by North Dakota Country Elevators, 1956-57." A. E. Report No. 14, May, 1959.^{3/}

District 1 showed the greatest percentage increase in the proportion of total grain trucked, 9 percent in the 1956 crop year to 21 percent for the 1957 crop year. Crop Reporting District 2 had only a small percent of the total grain purchased trucked in both the 1956 and 1957 crop years.

Crop Reporting District 9 had approximately 44 percent of the trucked corn, as compared to about 85 percent of the trucked corn for the 1956 crop year. This District also had 43 percent of the soybeans trucked in 1957 compared to 52 percent in 1956, and 21 percent of the flax trucked and 27 percent of the other grains trucked (Table 4).

^{3/}All further references to the year 1956 statistics are from this same reference.

TABLE 4. TOTAL GRAIN MOVED BY TRUCK FROM ELEVATORS, PERCENTAGE BY CROP REPORTING DISTRICTS, NORTH DAKOTA, 1957 CROP.

		TOTAL GRAIN MOVED BY TRUCK (000 bu.)										
		Corn	Wheat	Oats	Soybeans	Flax	Barley	Rye	Other	Total		
1956		619	3,612	2,605	735	888	518	58	286	9,324		
1957		221	6,656	2,020	1,288	1,516	1,432	22	971	14,126		
SOURCE OF TRUCKED GRAIN (PERCENT OF TOTAL TRUCKED)												
CRD												
1-1956		0	10.8	14.3	0	8.4	3.9	0	0	9.2		
1957		0	28.9	22.7	3.1	17.0	17.6	0	0	20.7		
2-1956		.2	4.1	1.8	0	4.3	1.2	3.4	0	2.6		
1957		0	2.1	1.1	0	.3	3.6	0	2.4	1.7		
3-1956		0	25.5	7.1	1.4	15.2	10.5	0	11.2	14.4		
1957		0	24.0	6.7	0	13.9	3.3	0	0	14.1		
4-1956		0	4.6	8.7	0	5.7	3.3	0	0	4.9		
1957		0	7.5	4.2	0	4.5	2.5	0	0	4.9		
5-1956		0	3.1	15.4	.9	1.0	0	0	0	5.7		
1957		0	8.6	12.9	0	5.7	16.6	19.4	0	8.4		
6-1956		15.3	17.3	17.7	45.5	34.8	42.7	3.4	9.4	22.3		
1957		55.8	8.4	16.4	54.0	30.0	38.5	0	70.4	24.0		
7-1956		0	19.9	1.9	0	5.1	6.4	68.1	0	9.5		
1957		0	10.6	14.8	0	2.5	10.8	39.9	0	8.5		
8-1956		0	9.7	7.6	0	9.4	6.8	0	0	7.1		
1957		.5	5.2	5.5	0	4.7	0	30.7	0	3.8		
9-1956		84.5	5.0	25.5	52.2	16.1	25.2	24.1	79.4	24.3		
1957		43.7	4.7	15.7	42.9	21.4	7.1	10.0	27.2	13.9		
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		

Crop Reporting District 6 had about 56 percent of the corn trucked in 1957, whereas it only accounted for 15 percent in 1956. Soybeans trucked increased from 45 percent in 1956 to 54 percent in 1957. Other grains trucked showed the greatest increase from 9 percent, 1956, to 70 percent, 1957.

For all grains trucked from North Dakota country elevators for the 1957 crop year, wheat comprised about 47 percent as compared to about 39 percent in 1956. Oats again ranked second with about 14 percent of the total, although it decreased from 28 percent in 1956. For the 1957 crop year, flax accounted for about 11 percent, barley 10 percent, soybeans 9 percent, other grains 7 percent, corn $1\frac{1}{2}$ percent and rye .15 percent of the grain trucked (Table 5).

TABLE 5. ALL GRAINS TRUCKED FROM NORTH DAKOTA ELEVATORS, BUSHEL TRUCKED AND PERCENT OF ALL GRAIN TRUCKED.

RANK		COMMODITY	BUSHEL		PERCENT OF TOTAL	
1956	1957		1956	1957	1956	1957
1	1	Wheat	3,612,173	6,655,924	38.74	47.11
2	2	Oats	2,065,058	2,019,747	27.94	14.29
3	3	Flax	888,454	1,516,117	9.53	10.73
6	4	Barley	518,214	1,432,408	5.56	10.14
4	5	Soybeans	735,112	1,288,333	7.88	9.12
7	6	Other	286,709	970,770	3.08	6.87
5	7	Corn	619,782	220,871	6.65	1.56
8	8	Rye	58,192	21,499	.62	.15
TOTAL			9,323,695	14,125,669	100.00	100.00

For the 1957 crop year, the 14,125,669 bushels trucked represented 7.2 percent of the total volume purchased. Crop Reporting District 9 with 11.4 percent of the total grain purchased trucked was most important. Crop Reporting District 6 actually had the largest volume of grain trucked and ranked a close second with approximately 11 percent of all grain purchased trucked (Figure 2).

NORTH DAKOTA

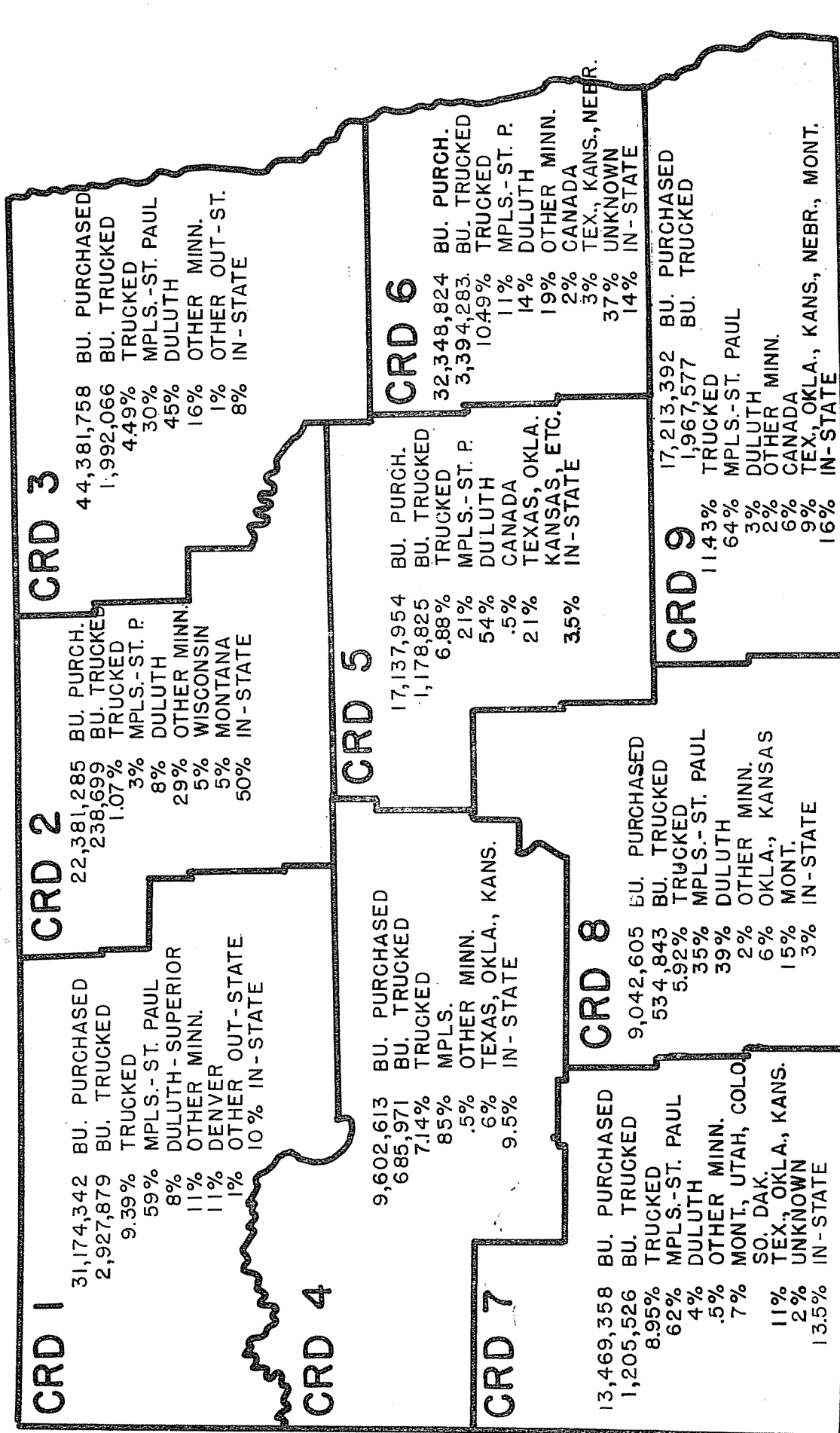


FIGURE 2 ALL GRAINS. TOTAL OF ALL GRAINS PURCHASED BY COUNTRY ELEVATORS, PERCENT OF GRAIN TRUCKED AND DESTINATIONS OF TRUCKED GRAIN BY CROP REPORTING DISTRICTS, NORTH DAKOTA, 1957 CROP.

CRD	PURCHASED	TRUCKED	TRUCKED	MPLS.-ST. PAUL	DULUTH	OTHER MINN.	SOUTH & WEST	UNKNOWN	CANADA	IN-STATE
CRD 1	196,752,131	14,125,669	7.18%	43.58%	18.23%	8.14%	8.33%	8.30%	1.32%	12.10%

Approximately 70 percent of the grain trucked went to Minnesota destinations. The terminal markets at Minneapolis-St. Paul received approximately 44 percent of the total trucked, with Duluth-Superior and other Minnesota destinations receiving the balance. The Southern and Western States received about 8 percent, Canada 1.32 percent, unknown points 8 percent, and the residual, about 12 percent, went to in-state destinations.

Of the 14,125,669 bushels trucked, 12,597,004 bushels or 89 percent went to out-of-state destinations (Table 6). The amount trucked out-of-state represents about 6 percent of the total amount purchased by elevators. The remaining 1,528,665 bushels went to destinations within the state. This proportion did not change but slightly from 1956. The out-of-state volume for 1956 was 88 percent and the balance went to in-state locations (Table 6).

Twenty-three percent of the grain trucked out-of-state came from Crop Reporting District 6, 22 percent from District 1, 14 percent from District 3, 13 percent from District 9, 9 and 8 percent from Districts 5 and 7 respectively and 5 percent or less from Districts 2, 4, and 8. The most significant change in this respect was in Crop Reporting District 1 where the percent of the grain trucked out-of-state changed from 10 percent in 1956 to 22 percent in 1957. District 9 decreased from 1956 to 1957, 20 to 13 percent (Table 6).

Of the total grain trucked out-of-state, the Minneapolis-St. Paul market received slightly under 50 percent (Appendix Table 1). This compares with slightly over 50 percent for the 1956 crop. Other Minnesota destinations received approximately 30 percent of the out-of-state trucked grain. Nineteen percent of the 1956 crop went to other Minnesota destinations. About 11 percent went to other out-of-state destinations such as South Dakota, Montana, Iowa, Colorado, Utah, Nebraska, Kansas, Oklahoma, Texas and Canada. Approximately 9 percent went to destinations unknown by the elevator operator.

The largest proportion of the in-state amount trucked originated in District 6 with about 37 percent. District 9 shipped 20 percent of the total volume purchased to in-state destinations. District 3 accounted for about 12 percent and all other Districts 10 percent or less (Table 6). Destinations of the in-state trucked grain for the 1957 crop are unknown as this question was not asked in the questionnaire. Appendix Table 3, however, shows the amount of total grain trucked in-state from each district and the amount of each commodity trucked to in-state destinations from each crop reporting district.

TABLE 6. ALL GRAINS SHIPPED OUT OF THE STATE AND IN-STATE BY TRUCK, BY CROP REPORTING DISTRICT, 1956-57 AND 1957-58.

	YEAR	1	2	3	4	5	6	7	8	9	TOTAL	PERCENT OF TOTAL TRUCKED
AMOUNT SHIPPED OUT-OF-STATE (Bushels)	1956	850,783	226,058	1,158,238	441,760	521,944	1,877,285	877,012	637,511	1,613,869	8,204,400	88.0
	1957	2,815,964	163,855	1,811,916	627,690	1,130,585	2,833,031	1,040,942	511,640	1,661,561	12,597,004	89.0
PERCENT OF TOTAL	1956	10.37	2.76	14.12	5.38	6.36	22.88	10.69	7.77	19.67	100.00	
	1957	22.36	1.30	14.38	4.98	8.98	22.49	8.26	4.06	13.19	100.00	
AMOUNT SHIPPED IN-STATE (Bushels)	1956	9,011	18,396	180,790	17,000	8,600	198,789	6,750	27,591	654,368	1,119,295	12.0
	1957	111,915	74,844	180,150	58,281	48,240	561,252	164,584	23,383	306,016	1,528,665	11.0
PERCENT OF TOTAL	1956	.81	1.64	16.15	1.52	.77	17.58	.60	2.47	58.46	100.00	
	1957	7.32	4.90	11.78	3.81	3.16	36.71	10.77	1.53	20.02	100.00	

INDIVIDUAL GRAINS

Wheat

Wheat led all other grains in the volume trucked. The 6,655,924 bushels trucked represented 47 percent of all grain trucked from North Dakota (Table 5).

Of the total volume of wheat purchased, 6.4 percent was trucked (Figure 3). This compares to 3 percent trucked in 1956. Eighty-nine percent of the wheat was trucked to Minnesota destinations. Seventy-eight percent of the 1956 crop went to these same points. About $2\frac{1}{2}$ percent went to unknown destinations, and 8 percent to in-state points.

Minneapolis-St. Paul received 58 percent of the out-of-state trucked wheat as compared to 69 percent of the 1956 wheat crop. Duluth-Superior received approximately 24 percent, which is a substantial increase over the 11 percent of the 1956 crop. Other Minnesota markets received 6 percent. Twelve percent of the trucked wheat in 1956 went to other Minnesota destinations.

Approximately 8 percent of the trucked wheat went to in-state destinations. Destinations of the in-state trucked wheat are unknown.

Crop Reporting District 1 trucked the largest volume and percent of wheat. The 1,919,793 bushels trucked represented 10 percent of the total purchased. District 3 trucked 8 percent, Districts 4 and 5, 7 percent and District 7, 6 percent. Districts 6, 8 and 9 trucked 5 percent of their wheat purchases. District 2 trucked only 1 percent of the volume purchased.

Oats

Twelve and one-half percent of the 16,152,521 bushels of oats purchased were shipped by trucks (Figure 4). The 2,019,747 bushels trucked represented 14 percent of all trucked grain from North Dakota (Table 5). In 1956, 13 percent of the oats were trucked. This comprised 28 percent of all grains trucked. Oats represented 14 percent of all grains trucked out-of-state (Appendix Table 2). In 1956 oats accounted for 31 percent of the out-of-state trucked grain.

The most common out-of-state destinations were Minneapolis-St. Paul, 19 percent, other Minnesota markets 5 percent and Southern and Western States 52 percent.

Crop Reporting District 1 trucked 38 percent of the total oats purchased in that district. District 8 reported 18 percent trucked, District 4, 17 percent, Districts 5 and 7, 16 percent, and the others 10 percent or less. As in 1956, a larger proportion of the oats purchased by elevators in the western districts of the state were trucked than elsewhere.

NORTH DAKOTA

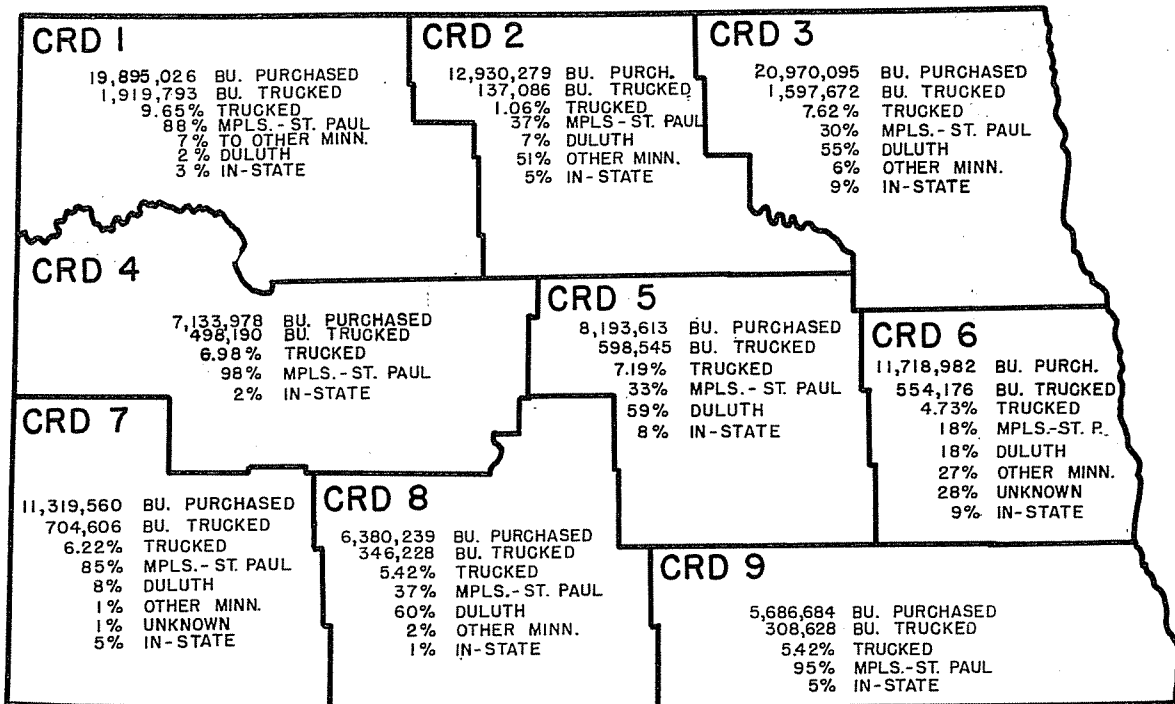


FIGURE 3 WHEAT. TOTAL WHEAT PURCHASED BY COUNTRY ELEVATORS, PERCENT OF PURCHASES TRUCKED AND DESTINATIONS OF TRUCKED WHEAT BY CROP REPORTING DISTRICTS, NORTH DAKOTA, 1957 CROP.

PURCHASED	104,228,456 BU.
TRUCKED	6,655,924 BU.
TRUCKED	6.4%
MPLS.-ST. PAUL	58.4%
DULUTH	24.3%
OTHER MINN.	6.4%
UNKNOWN	2.5%
IN-STATE	8.4%

NORTH DAKOTA

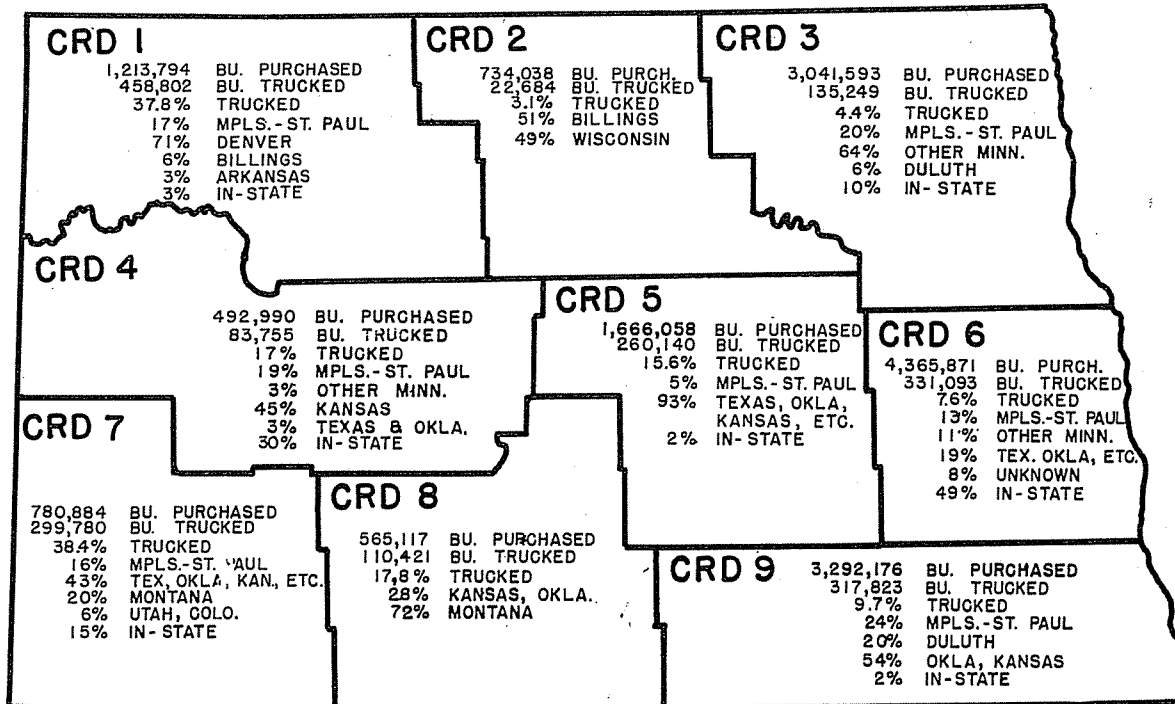


FIGURE 4 OATS. TOTAL OATS PURCHASED BY COUNTRY ELEVATORS, PERCENT OF PURCHASES TRUCKED AND DESTINATIONS OF TRUCKED OATS BY CROP REPORTING DISTRICTS, NORTH DAKOTA, 1957 CROP.

PURCHASED	16,152,521 BU.
TRUCKED	2,019,747 BU.
TRUCKED	12.5%
MPLS.-ST. PAUL	19.4%
DULUTH	3.3%
OTHER MINN.	2.1%
OKLA., TEX., KAN., ETC.	26.0%
MONT., COLO., UTAH	26.0%
CANADA	.2%
UNKNOWN	1.5%
MISC.	3.0%
IN-STATE	18.5%

Flax

As in 1956, flax ranked third behind wheat and oats in the volume shipped by truck. Of the 14,358,013 bushels purchased, 1,516,117 bushels or 11 percent was trucked (Figure 5).

Ninety-five percent of all flax trucked was moved to out-of-state destinations. Flax ranked third behind wheat and oats in the out-of-state movement of trucked grain. Eleven percent of all grains trucked out-of-state were oats (Appendix Table 1).

Sixty-five percent of the trucked flax went to Minneapolis-St. Paul as compared to 78 percent in 1956. Twenty-one percent went to other Minnesota destinations. Approximately 5 percent went to in-state destinations.

Crop Reporting District 9 led all others with 29 percent of the total purchased volume trucked. District 6 reported 17 percent trucked. All others reported 11 percent or less with District 2 reporting .3 percent trucked.

Barley

For the 1957 crop, barley ranked fourth in total amount trucked. In 1956 barley ranked sixth for all grains trucked (Table 5). Ten percent of all grains trucked was barley.

Only 3 percent of the 54,950,482 bushels purchased or 1,432,408 bushels were trucked (Figure 6). This represents an increase over 1956, however, since only 1 percent of the 1956 barley purchased crop was trucked.

A significant shift in destinations from 1956 to 1957 was indicated in the truck movement of barley. Minneapolis-St. Paul received 22 percent of the 1957 crop whereas the Twin Cities terminal markets received about 50 percent of the 1956 purchased crop. Duluth-Superior received 54 percent of the 1957 crop trucked. This market received only 1 percent of the 1956 crop moved by truck.

District 7 reported 19 percent of the total barley purchases shipped by truck. District 6 reported only 5 percent but accounted for over one-third of the total volume trucked. Districts 1, 7 and 9 were the source of another one-third and the other Districts represented the balance.

Sixteen percent of the trucked barley went to in-state destinations. District 2 reported 87 percent of the trucked volume moved to in-state destinations, District 4, 64 percent, and District 7, 51 percent. District 8 reported no barley trucked.

Soybeans

Soybeans ranked fifth in total volume trucked. The 1,288,333 bushels represented 9 percent of all grains trucked. In 1956 soybeans ranked fourth even though the amount trucked in 1957 indicates significant increases in both amount trucked and percent trucked (Table 5).

NORTH DAKOTA

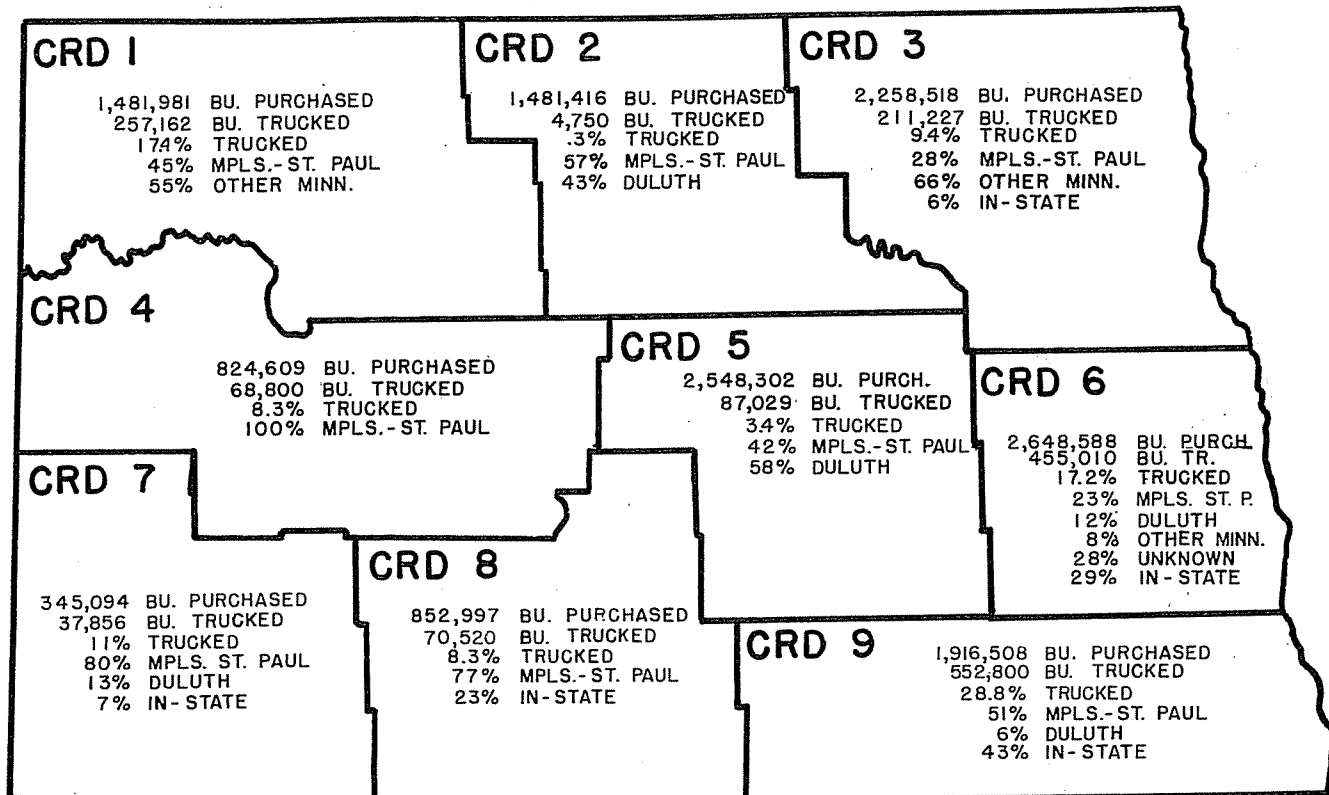


FIGURE 5 FLAX. TOTAL FLAX PURCHASED BY COUNTRY ELEVATORS, PERCENT OF PURCHASES TRUCKED AND DESTINATIONS OF TRUCKED FLAX BY CROP REPORTING DISTRICTS, NORTH DAKOTA, 1957 CROP

PURCHASED	14,358,013	BU.
TRUCKED	1,516,117	BU.
TRUCKED	10.6%	
MPLS.-ST.-PAUL	65.0%	
DULUTH	7.0%	
OTHER MINN.	13.9%	
UNKNOWN	8.7%	
IN-STATE	5.4%	

NORTH DAKOTA

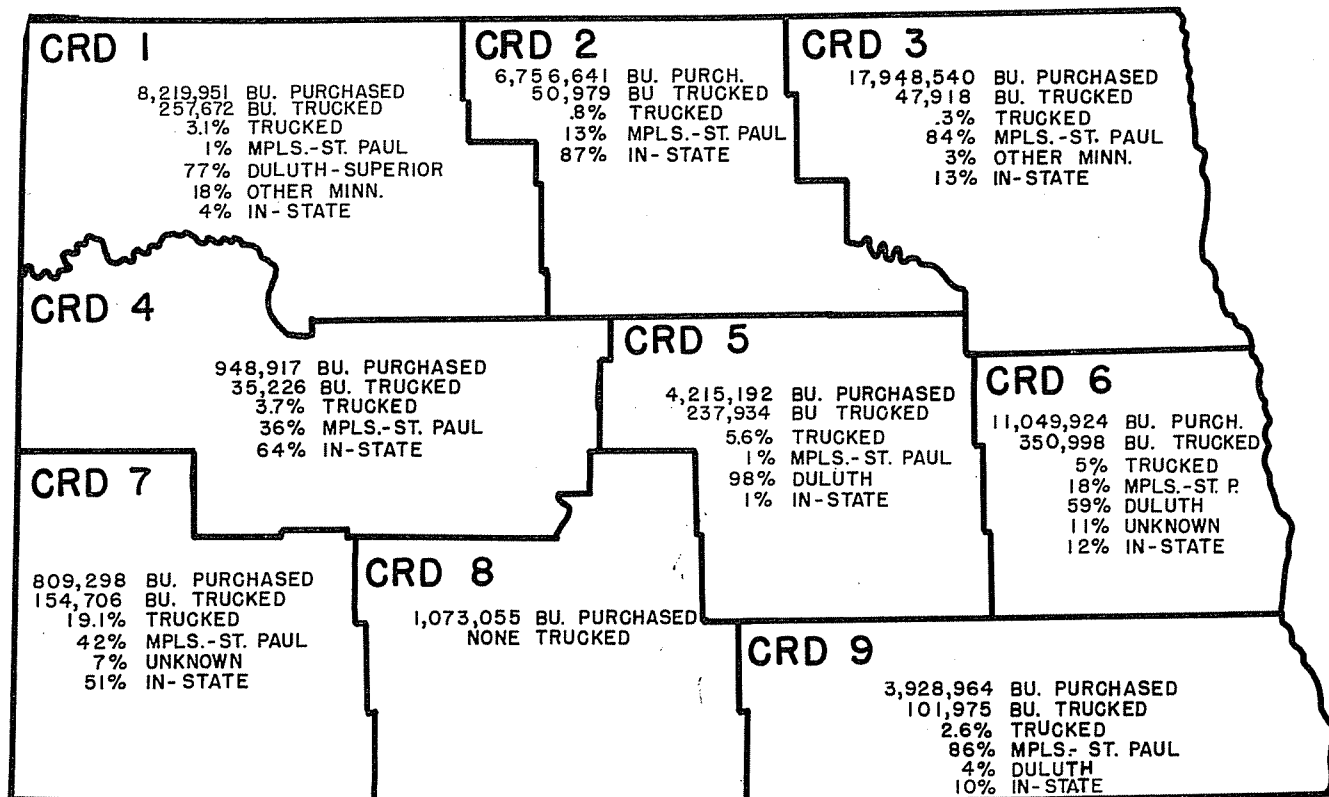


FIGURE 6 BARLEY. TOTAL BARLEY PURCHASED BY COUNTRY ELEVATORS, PERCENT OF PURCHASES TRUCKED AND DESTINATIONS OF TRUCKED BARLEY BY CROP REPORTING DISTRICTS, NORTH DAKOTA, 1957 CROP.

PURCHASED	54,950,482	BU.
TRUCKED	1,432,408	BU.
TRUCKED	2.6%	
MPLS.-ST. PAUL	21.6%	
DULUTH-SUPERIOR	53.7%	
OTHER MINN.	3.4%	
UNKNOWN	5.1%	
IN-STATE	16.2%	

Soybeans accounted for the largest percentage of purchased volume moved by truck. The 1,288,333 bushels trucked represents 63 percent of the 2,043,645 bushels purchased (Figure 7). In 1956, 50 percent of the total amount purchased was trucked.

Minneapolis-St. Paul received 35 percent of the total amount trucked. Other Minnesota points received 27 percent, Canada 14 percent. Twelve percent was moved to in-state points.

As in 1956 most of the trucked soybeans came from Crop Reporting Districts 6 and 9. Districts 5 and 7 reported small amounts purchased but accounted for none of the trucked volume. District 1 reported 39,000 bushels trucked, all to in-state destinations. District 1 reported no soybean purchases, however. The only assumption that can be made is that none were purchased from North Dakota growers, but rather from Montana or other adjacent producing areas.

As in 1956, 12 percent of the total trucked soybeans went to in-state destinations.

Other Grains

The bulk of the grain in this category is millet. Sunflower seed also comprised some of the grain in this category.

Of the 1,306,389 bushels purchased, 970,770 bushels or 74 percent were trucked (Figure 8). This amount represented about 7 percent of the total grains trucked. This is an increase over the 1956 figure of 3 percent.

Minneapolis-St. Paul received about 3 percent of the amount trucked. Sixty-eight percent went to unknown destinations. Thirty percent was reported trucked to in-state destinations.

Crop Reporting Districts 6 and 9 were responsible for practically all of the grain in this category. Ninety-one percent of the other grains trucked from District 9 went to in-state destinations, while District 6 reported 96 percent of the trucked volume went to unknown out-of-state destinations. District 2 reported 18 percent of the total purchased volume trucked. All of this went to in-state destinations.

Corn

The 220,871 bushels of corn trucked represented about 2 percent of all grains trucked. The amount trucked was considerably less than the 619,782 bushels trucked in 1956. This caused corn to rank only seventh in importance whereas corn ranked fifth in all grains trucked in 1956 (Table 5).

Of the 1,046,469 bushels purchased, the amount trucked represents 19 percent (Figure 9). Unlike 1956 when only 20 percent was moved to out-of-state destinations, approximately 90 percent of the total trucked went to out-of-state points.

The most important out-of-state destinations were Minneapolis-St. Paul, 47 percent of the total amount trucked, other Minnesota markets, 37 percent, Montana and Canada 5 percent and in-state points 11 percent.

NORTH DAKOTA

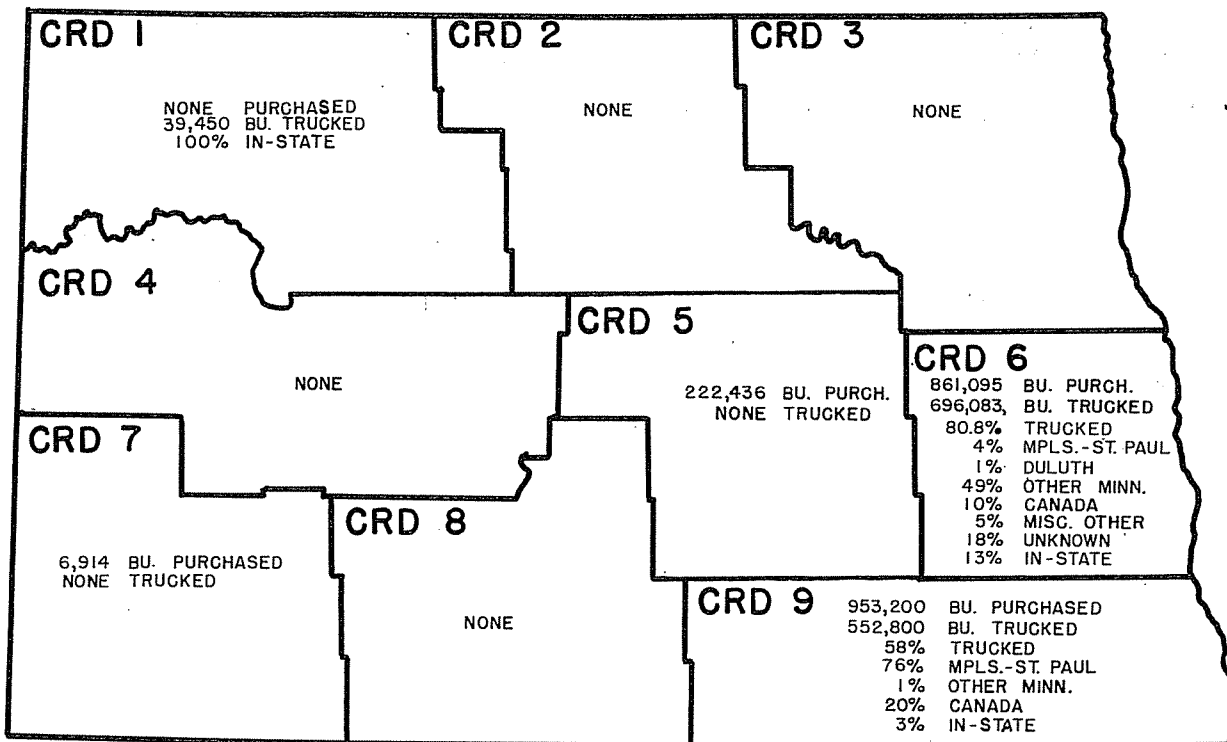


FIGURE 7 SOYBEANS. TOTAL SOYBEANS PURCHASED BY COUNTRY ELEVATORS, PERCENT OF PURCHASES TRUCKED AND DESTINATIONS OF TRUCKED SOYBEANS BY CROP REPORTING DISTRICTS, NORTH DAKOTA, 1957 CROP.

PURCHASED	2,043,645	BU.
TRUCKED	1,288,333	BU.
TRUCKED	63.0%	
MPLS.-ST. PAUL	34.8%	
DULUTH	.7%	
OTHER MINN.	26.7%	
CANADA	13.9%	
MISC.	2.6%	
UNKNOWN	9.5%	
IN-STATE	11.8%	

NORTH DAKOTA

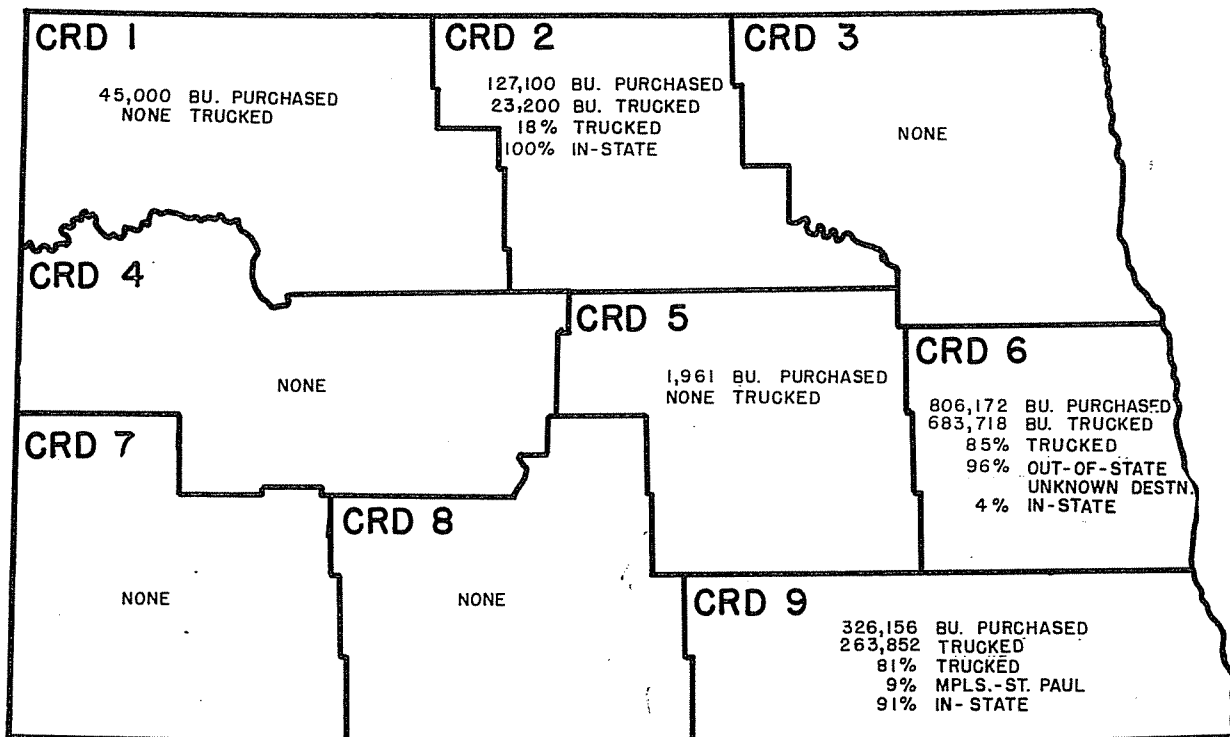


FIGURE 8 OTHER GRAINS. TOTAL OTHER GRAINS PURCHASED BY COUNTRY ELEVATORS, PERCENT OF PURCHASES TRUCKED AND DESTINATIONS OF TRUCKED OTHER GRAINS BY CROP REPORTING DISTRICTS, NORTH DAKOTA, 1957 CROP

PURCHASED	1,306,389	BU.
TRUCKED	970,770	BU.
TRUCKED	74.3%	
MPLS.-ST. PAUL	2.6%	
UNKNOWN		
(OUT-OF-STATE)	67.5%	
IN-STATE	29.9%	

NORTH DAKOTA

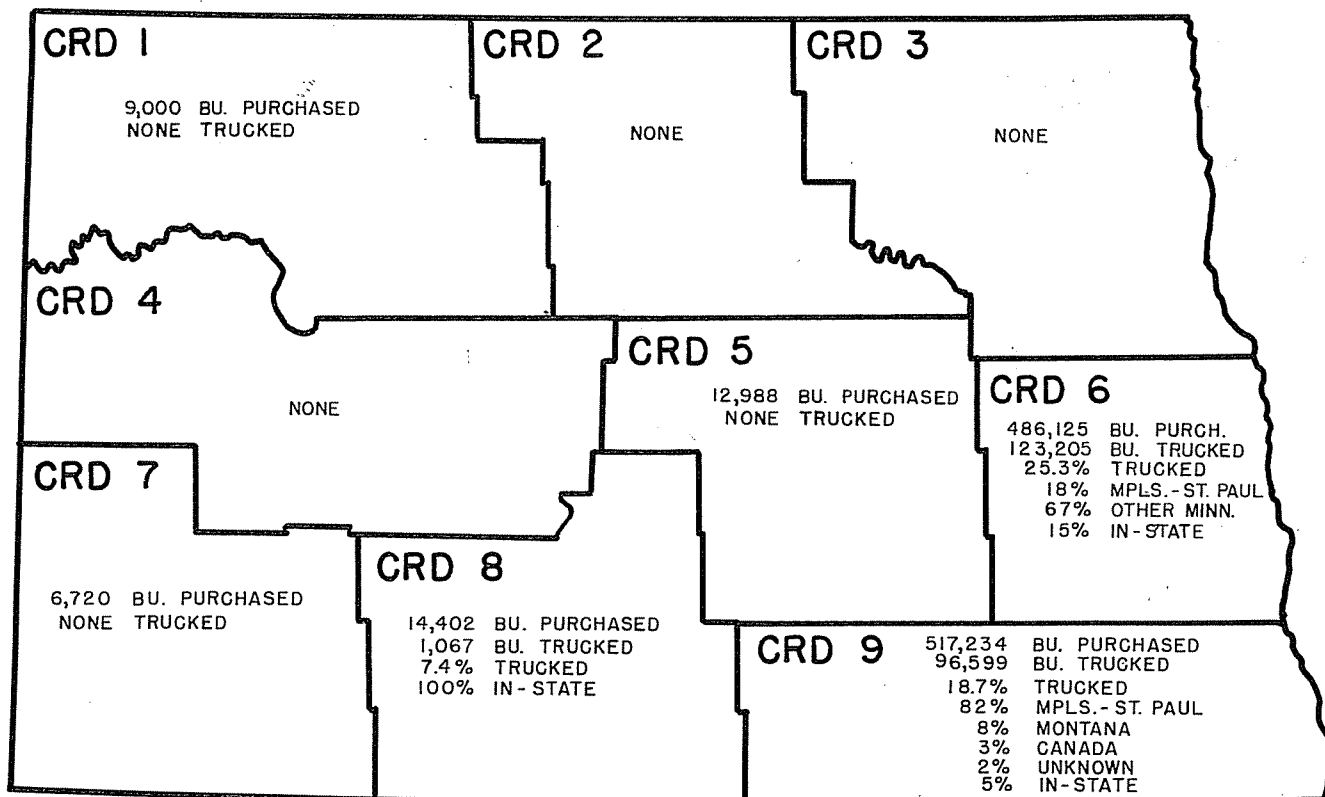


FIGURE 9 CORN. TOTAL CORN PURCHASED BY COUNTRY ELEVATORS, PERCENT OF PURCHASES TRUCKED AND DESTINATIONS OF TRUCKED CORN BY CROP REPORTING DISTRICTS, NORTH DAKOTA, 1957 CROP.

PURCHASED	1,046,469	BU.
TRUCKED	220,871	BU.
TRUCKED	19.20%	
MPLS.-ST. PAUL	46.6%	
OTHER MINN.	37.3%	
MONTANA	3.3%	
CANADA	1.2%	
IN-STATE	11.1%	
UNKNOWN	.5%	

NORTH DAKOTA

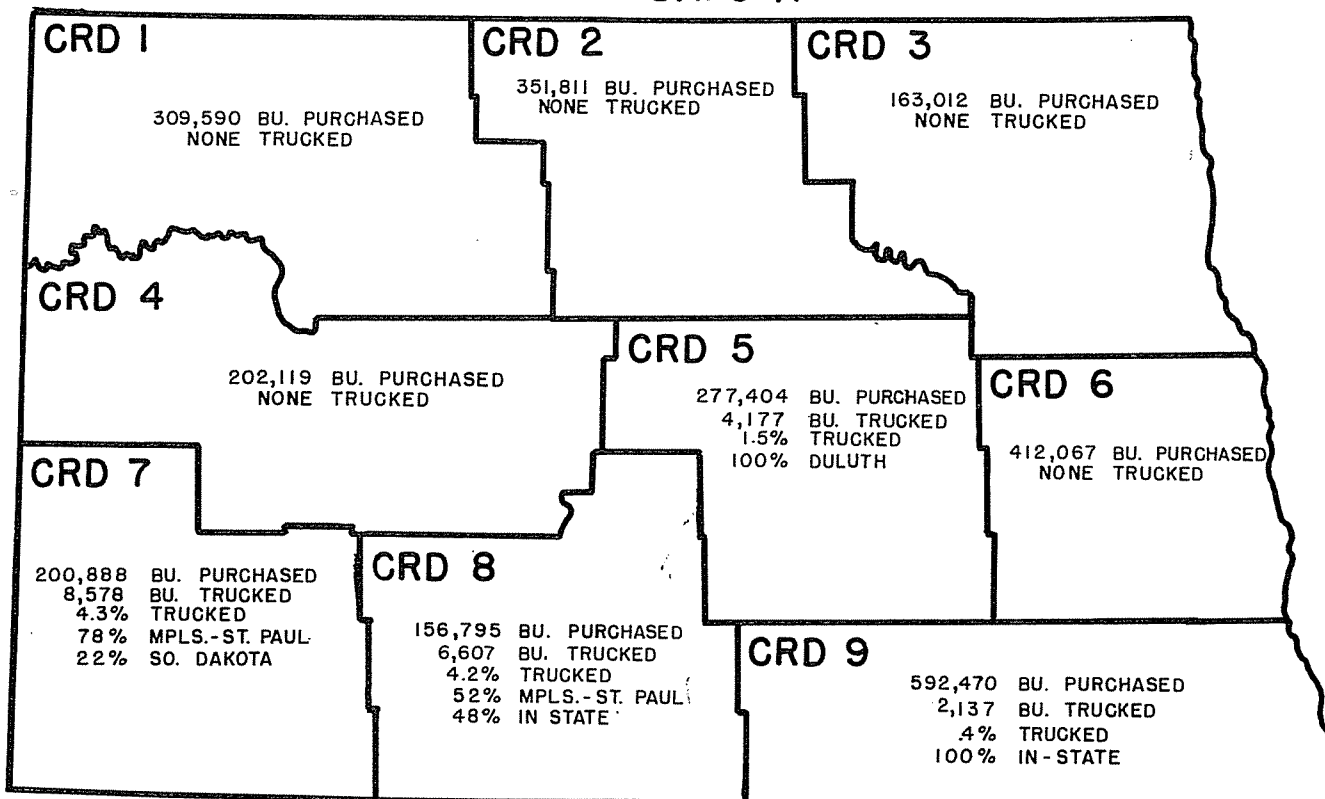


FIGURE 10 RYE. TOTAL RYE PURCHASED BY COUNTRY ELEVATORS, PERCENT OF PURCHASES TRUCKED AND DESTINATIONS OF TRUCKED RYE BY CROP REPORTING DISTRICTS, NORTH DAKOTA, 1957 CROP.

PURCHASED	2,666,156	BU.
TRUCKED	21,499	BU.
TRUCKED	.8%	
MPLS.-ST. PAUL	47.0%	
DULUTH	19.4%	
S. DAK.	8.9%	
IN-STATE	24.7%	

Crop Reporting Districts 6 and 9 accounted for almost all of the trucked corn. District 6 reported 25 percent of the total purchased trucked. District 9 reported 19 percent.

Rye

Less than 1 percent of the rye purchased was trucked. Of the 2,666,156 bushels purchased, only 21,499 bushels were trucked (Figure 10). This volume represented only .15 percent of all grains trucked (Table 5).

Minneapolis-St. Paul received 47 percent of the trucked rye, Duluth 19 percent, South Dakota 9 percent, and 25 percent went to in-state destinations.

Factors Affecting Trends in Truck Grain Shipping

Many factors are responsible for the continued shift to motor carriers for movement of grain to market. Chief among these factors are the differentials in the freight rates charged between railroads and trucks, the shortage and physical condition of railroad grain boxcars, less time in transit offered by trucks, convenience in loading the trailer unit and the subsequent immediate disposition of the truck and trailer and the increasing demand of trucking organizations for backhauls to home terminals.

Motor carriers enjoy the privilege of the agricultural exemption clause in the Interstate Commerce Act. Transportation of certain of these commodities are not subject to regulation by the Interstate Commerce Commission thus allowing greater freedom in rate making. Heretofore, railroads were not allowed much latitude in shifting competitive rates downward. There seems to be a tendency toward altering this situation, however, as demonstrated in certain legislation in the Transportation Act of 1958. In Section 15a of Part I of the Interstate Commerce Act, the rule of rate-making, has been altered to instruct the Commission to give due consideration, in rate litigation, to the needs of the particular type of carrier rather than the effect of a rate decrease on other types of carriers revenues; "Rates of a carrier shall not be held up to a particular level to protect the traffic of any other mode of transportation."^{4/}

Revision of Section 203b, Part II, Interstate Commerce Act also came under attack in the Act. Certain commodities were added or deleted from the agricultural commodities exemption list.^{2/} Although grains were not affected, the legislation

^{4/}The Interstate Commerce Act, Revised to October 1, 1958. United States Government Printing Office, Washington, D. C., 1958, p. 64.

^{2/}Robert W. Harbeson, "The Transportation Act of 1958." Land Economics, a quarterly journal of Planning, Housing and Public Utilities. Volume XXXV, Number 2. University of Wisconsin, Madison, Wisconsin. May 1959, p. 164.

points out a trend towards revision of this particular phase of the Act. Motor carriers of grains are highly dependent upon this clause to support their competitive advantage position.

Another important recent event that may have a significant impact upon the trend in truck shipping of North Dakota grains is the opening of the St. Lawrence Seaway for ocean going vessels. Not only are new markets opened, but already investigations are underway into the possible effects on the transportation systems in North Dakota. Western railroads have proposed a plan to refund a percentage of the freight charges paid on grain shipments when a shipper routes an agreed portion of his traffic by rail each year.^{6/} This plan was not readily accepted by various groups,^{7/} but it serves as a good indication of changes that may take place as a result of the Seaway.

Another significant event is the legislation enacted by the 1959 North Dakota State Legislature affecting the transportation industry of this state. An increase in truck length from 50 to 60 feet and increased weights were approved. The Legislature also placed back into law provisions whereby the highway commissioner may enter into reciprocity agreements with other states or make other arrangements whereby the registration fees of trucks will be prorated according to the amount of travel in each state.

As a part of the questionnaire, North Dakota elevator operators were asked their opinion on this subject. The results are shown in Table 7.

TABLE 7. NUMBER OF RETURNS FROM EACH CROP REPORTING DISTRICT AND THE NUMBER OF RESPONSES TO THE QUESTION, "THE 1959 NORTH DAKOTA STATE LEGISLATURE INCREASED LENGTH AND LOAD LIMITS ON TRUCKS ON NORTH DAKOTA HIGHWAYS. WHAT EFFECT WILL THIS HAVE ON MOVEMENT OF GRAIN TO MARKET BY TRUCK?"

	CROP REPORTING DISTRICT																			
	1		2		3		4		5		6		7		8		9		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Increase	20	45	27	62	40	58	9	56	20	55	21	70	11	65	12	58	21	46	181	56
Decrease	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2	9	0	0	3	1
No Change	10	23	12	27	15	22	4	25	10	28	4	13	2	12	6	27	13	28	76	23
Did Not Reply	14	32	5	11	13	19	3	19	6	17	5	17	4	23	2	9	12	26	64	20
TOTAL	44	100	44	100	69	100	16	100	36	100	30	100	17	100	22	100	46	100	324	100

^{6/}Traffic World. Number 17, Volume 103. April 25, 1959, p. 37.

^{7/}Traffic World. Number 20, Volume 103. May 16, 1959, p. 31.

Over half of the elevator managers felt that this would aid in increasing the amount of grain trucked from North Dakota.

Elevator operators were also asked to indicate their opinion on several other questions. When asked, "Do you think the movement of grain to market by truck will continue to increase?", sixty-six percent made an affirmative response while only 9 percent indicated a negative answer. This result is almost identical with the response to the same question in the 1956 survey. (Table 8).

TABLE 8. NUMBER OF RETURNS FROM EACH CROP REPORTING DISTRICT AND THE NUMBER OF RESPONSES TO THE QUESTION, "DO YOU THINK MOVEMENT OF GRAIN TO MARKET BY TRUCK WILL CONTINUE TO INCREASE?"

	CROP REPORTING DISTRICT										TOTAL									
	1		2		3		4		5				6		7		8		9	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Yes	26	59	28	64	41	59	9	56	29	80	24	80	14	82	11	50	33	72	215	66
No	4	9	6	13	7	10	2	13	1	3	3	10	1	6	2	9	2	4	28	9
No Change	7	16	7	16	11	16	3	19	5	14	1	3	1	6	5	23	4	9	44	14
Did Not Reply	7	16	3	7	10	15	2	12	1	3	2	7	1	6	4	18	7	15	37	11
TOTAL	44	100	44	100	69	100	16	100	36	100	30	100	17	100	22	100	46	100	324	100

The interstate highway program in North Dakota which will eventually be composed of U. S. 94, east-west, and U. S. 29, north-south along the eastern border is progressing at a rapid pace. U. S. 94 has been completed between Valley City and Jamestown and other sections are currently under construction east and west of these locations. Elevator operators were asked their opinion on the probable effect of this factor on truck shipping of grain from North Dakota. Fifty-four percent felt it would have an increasing effect (Table 9). This compares to 47 percent who thought it would increase truck movement of grain in the 1956 survey.

TABLE 9. NUMBER OF RETURNS FROM EACH CROP REPORTING DISTRICT AND THE NUMBER OF RESPONSES TO THE QUESTION, "WHAT EFFECT WILL THE NEW HIGHWAY PROGRAM HAVE ON MOVEMENT OF GRAIN TO MARKET?"

CROP REPORTING DISTRICT													TOTAL							
	1		2		3		4		5		6		7		8		9		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Increase	20	45	24	54	37	54	6	38	22	61	17	57	10	59	11	50	27	59	174	54
Decrease	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No Change	10	23	13	29	21	30	5	31	6	17	9	30	3	18	7	32	7	15	81	25
Did Not Reply	14	32	7	17	11	16	5	31	8	22	4	13	4	23	4	18	12	26	69	21
TOTAL	44	100	44	100	69	100	16	100	36	100	30	100	17	100	22	100	46	100	324	100

The railroads of North Dakota as a result of their drive toward economy of operation are proposing elimination of many branch line trains and substitution of tri-weekly for daily service where it is not already in effect. Elevator operators were asked to express their opinion on this situation. Sixty-three percent felt it would lead toward increased movement of grain to market by truck. Only 1 percent indicated a decreasing effect. (Table 10).

TABLE 10. NUMBER OF RETURNS FROM EACH CROP REPORTING DISTRICT AND THE NUMBER OF RESPONSES TO THE QUESTION, "IF THE RAILROADS OF NORTH DAKOTA SUCCEED IN REDUCING BRANCH LINE SERVICE TO TRI-WEEKLY TRIPS, AS THEY PROPOSE, WHAT EFFECT WILL THIS HAVE ON GRAIN MOVED TO MARKET BY TRUCK?"

CROP REPORTING DISTRICT													TOTAL							
	1		2		3		4		5		6		7		8		9		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Increase	26	59	28	64	44	64	8	50	23	64	21	70	10	59	12	55	31	68	203	63
Decrease	0	0	0	0	2	3	1	6	0	0	0	0	0	0	0	0	1	2	4	1
No Change	7	16	13	29	9	13	4	25	9	25	4	13	4	23	6	27	6	13	62	19
Did Not Reply	11	25	3	7	14	20	3	19	4	11	5	17	3	18	4	18	8	17	55	17
TOTAL	44	100	44	100	69	100	16	100	36	100	30	100	17	100	22	100	46	100	324	100

Elevator operators were also asked what proportion of their trucked grain was moved by different kinds of motor carriers, i.e., common carriers, private carriers, milling company or cooperative operated vehicles, or strictly itinerant haulers. These answers were in percentage figures and thus difficult to analyze. By perusing the tabulated data, the only assumption that seems evident is that those elevators that use a particular kind of carrier seem to maintain their relations with this type quite constantly. It seems that common carriers are the preferred type of hauler.

SUMMARY AND CONCLUSIONS

The volume of grain shipped by truck from country elevators to first destinations increased from 4.8 percent of the total purchased volume in 1956 to 7.2 percent in 1957.

Approximately 89 percent of the trucked grain was shipped to out-of-state destinations. The other 11 percent went to in-state destinations.

Approximately 50 percent of the out-of-state trucked grain went to Minneapolis-St. Paul and 21 percent went to Duluth-Superior. Fifty percent of the 1956 amount went to the Twin-Cities, but only 6 percent went to the Great Lakes points.

Wheat accounted for the major portion of the out-of-state movement, approximately 50 percent. All other commodities were quite evenly ranked with oats accounting for 14 percent and rye only .13 percent. Wheat also led the in-state movement with 17 percent of the total in-state trucked volume.

Districts 6 and 1 accounted for 45 percent of the out-of-state movement. Districts 3 and 9 were the source of 28 percent. Districts 6 and 9 were responsible for 57 percent of the in-state trucked grain.

Wheat, oats and flax ranked in that order in total amount trucked. Barley ranked fourth, jumping from sixth in 1956. Soybeans, rye and other grains remained in their comparative positions. Corn slipped to seventh after ranking fifth in 1956.

Wheat increased from 39 percent of the total in 1956 to 47 percent in 1957. Oats decreased from 28 percent to 14 percent. Others did not change significantly.

Federal legislation in the Transportation Act of 1958 produced significant changes in transportation field indicating probable future trends in the attitudes of law-makers and Commission personnel.

The St. Lawrence Seaway has been opened for ocean-going vessels. This should have significant effects on the transportation of grains from North Dakota.

The 1959 North Dakota State Legislature passed laws easing restrictions on length and weight limits for trucks on North Dakota highways. Elevator operators felt this would have a significant effect on the truck shipment of grain.

The majority of the elevator managers indicated that reduction in rail branch line service would serve to increase the tendency to ship grain by truck.

Most elevators ship via one type of motor carrier consistently. Common carriers seem to get the bulk of the trade.

With the increasing tendency toward truck shipping of grain, those groups directly affected such as, grain exchange officials, elevator operators and processors at terminal markets, and competing modes of transportation, will find adjustment necessary.

The trend in the next few years will be affected by federal and state legislation, and the ability of other modes of transportation to compete favorably with trucks in the movement of country grain to terminal markets and ports.

APPENDIX

Table 1.....Grain Trucked out of the State, by Commodities, by Destination.

Table 2.....Grain Trucked out of the State, by Commodities, by Crop
Reporting District.

Table 3.....Grain Trucked Within the State, by Commodities by Crop
Reporting District.

TABLE 1. GRAIN TRUCKED OUT OF THE STATE, BY COMMODITIES, BY DESTINATION.

DESTINATION	CORN (bu)	WHEAT (bu)	OATS (bu)	SOYBEANS (bu)	FLAX (bu)	BARLEY (bu)	RYE (bu)	OTHER (bu)	TOTAL (bu)	PERCENT OF TOTAL
Mpls-St. Paul	102,874	4,059,681	390,922	447,852	884,079	309,083	10,110	24,921	6,229,522	49.45
Duluth-Superior	-----	1,628,148	66,870	9,000	104,720	769,517	4,177	-----	2,584,432	20.52
Other Minnesota	82,500	424,079	41,470	343,784	210,020	48,339	-----	-----	1,150,192	9.13
S. Dak., Mont., Ia.	7,300	-----	179,195	-----	-----	-----	1,920	-----	188,415	1.50
Colorado-Utah	-----	-----	345,000	-----	-----	-----	-----	-----	345,000	2.74
Neb., Kan., Okla., Tex.	-----	-----	643,890	-----	-----	-----	-----	-----	643,890	5.11
Canada	2,600	-----	4,472	179,686	-----	-----	-----	-----	186,758	1.48
Miscellaneous	-----	-----	62,264	33,816	-----	-----	-----	-----	96,080	.76
Unknown	1,576	158,000	30,761	122,400	131,500	73,500	-----	655,538	1,172,775	9.31
TOTAL	196,850	6,269,908	1,764,784	1,136,538	1,332,319	1,199,939	16,207	680,459	12,597,004	100.00
Percent of Total	1.56	49.77	14.01	9.02	10.58	9.53	.13	5.40		100.00

TABLE 2. GRAIN TRUCKED OUT OF THE STATE, BY COMMODITIES, BY CROP REPORTING DISTRICT, 1957-58

CROP REPORTING DISTRICT	CORN (bu)	WHEAT (bu)	OATS (bu)	SOYBEANS (bu)	FLAX (bu)	BARLEY (bu)	RYE (bu)	OTHER (bu)	TOTAL (bu)	PERCENT OF TOTAL
DISTRICT 1	---	1,859,400	449,406	---	257,162	249,996	---	---	2,815,964	22.36
DISTRICT 2	---	129,685	22,684	---	4,750	6,736	---	---	163,855	1.30
DISTRICT 3	---	1,452,119	120,281	---	197,825	41,691	---	---	1,811,916	14.38
DISTRICT 4	---	486,875	59,255	---	68,000	12,760	---	---	627,690	4.98
DISTRICT 5	---	546,082	258,083	---	87,029	235,214	4,177	---	1,130,585	8.98
DISTRICT 6	105,205	498,409	171,551	599,506	315,088	487,734	---	655,538	2,833,031	22.49
DISTRICT 7	---	662,579	260,260	---	35,219	74,306	8,578	---	1,040,942	8.26
DISTRICT 8	---	343,069	110,421	---	54,518	---	3,452	---	511,460	4.06
DISTRICT 9	91,645	291,690	312,843	537,032	311,928	91,502	---	24,921	1,661,561	13.19
TOTAL	196,850	6,269,908	1,764,784	1,136,538	1,332,319	1,199,939	16,207	680,459	12,597,004	100.00
PERCENT OF TOTAL	1.56	49.77	14.01	9.02	10.58	9.53	.13	5.40		100.00

TABLE 3. GRAIN TRUCKED WITHIN THE STATE BY COMMODITIES, BY CROP REPORTING DISTRICT, 1957-58.

CROP REPORTING DISTRICT	CORN (bu)	WHEAT (bu)	OATS (bu)	SOYBEANS (bu)	FLAX (bu)	BARLEY (bu)	RYE (bu)	OTHER (bu)	TOTAL (bu)	PERCENT OF TOTAL
DISTRICT 1	---	60,393	9,396	39,450	---	2,676	---	---	111,915	7.32
DISTRICT 2	---	7,401	---	---	---	44,243	---	23,200	74,844	4.90
DISTRICT 3	---	145,553	14,968	---	13,402	6,227	---	---	180,150	11.78
DISTRICT 4	---	11,315	24,500	---	---	22,466	---	---	58,281	3.81
DISTRICT 5	---	43,463	2,057	---	---	2,720	---	---	48,240	3.16
DISTRICT 6	18,000	55,767	159,542	96,577	139,922	63,264	---	28,180	561,252	36.71
DISTRICT 7	---	42,027	39,520	---	2,637	80,400	---	---	164,584	10.77
DISTRICT 8	1,067	3,159	---	---	16,002	---	3,155	---	23,383	1.53
DISTRICT 9	4,954	16,938	4,980	15,768	11,835	10,473	2,137	238,931	306,016	20.02
TOTAL	24,021	385,916	254,963	151,795	183,798	232,469	5,392	290,311	1,528,665	100.00
PERCENT OF TOTAL	1.57	25.25	16.68	9.93	12.02	15.21	.35	18.99		100.00