



*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

*No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.*

# Staff Papers Series

Staff Paper P88-25

August 1988

MINNESOTA GRAIN MOVEMENTS

1985

by

David E. Buschena

Jerry E. Fruin

Daniel W. Halbach



**Department of Agricultural and Applied Economics**

University of Minnesota  
Institute of Agriculture, Forestry and Home Economics  
St. Paul, Minnesota 55108

MINNESOTA GRAIN MOVEMENTS  
1985

by

David E. Buschena  
Jerry E. Fruin  
Daniel W. Halbach

August, 1988

Special acknowledgment to Don Hirasuna for survey tabulation and data preparation, to Mel Loesch of the Minnesota Department of Transportation for providing and interpreting ICC rail waybill data and to all the firms which participated in the grain survey.

This research was undertaken for the North Central Regional Research Committee NC-137 National Grain Flow Study.

Staff Papers are published without formal review within the Department of Agricultural and Applied Economics.

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, religion, color, sex, national origin, handicap, age, or veteran status or sexual orientation.

## TABLE OF CONTENTS

	Page
List of Figures.....	ii
List of Tables.....	iii
Metric Conversion Table.....	iv
Introduction.....	1
Minnesota and United States Grain Exports - 1983 and 1985.....	3
Gulf of Mexico Ports.....	3
Pacific Northwest Ports.....	8
Port of Duluth/Superior.....	14
Minnesota Grain Movements - 1983 and 1985.....	19
All Commodities.....	19
Minnesota Corn Movements.....	33
Minnesota Wheat Movements.....	41
Minnesota Soybean Movements.....	46
List of Sources.....	54

## LIST OF FIGURES

	Page
Figure 1. All Commodities -- 1983 and 1985 Exports from Gulf Ports.....	4
Figure 2. Corn -- 1983 and 1985 Exports from Gulf Ports.....	6
Figure 3. Wheat -- 1983 and 1985 Exports from Gulf Ports.....	7
Figure 4. Soybeans -- 1983 and 1985 Exports from Gulf Ports.....	9
Figure 5. All Commodities -- 1983 and 1985 Exports from Pacific Ports..	10
Figure 6. Corn -- 1983 and 1985 Exports from Pacific Ports.....	11
Figure 7. Wheat -- 1983 and 1985 Exports from Pacific Ports.....	12
Figure 8. Soybeans -- 1983 and 1985 Exports from Pacific Ports.....	13
Figure 9. All Commodities -- 1983 and 1985 Export and Domestic Shipments from Duluth/Superior Ports.....	15
Figure 10. Corn -- 1983 and 1985 Export and Domestic Shipments from Duluth/Superior Ports.....	16
Figure 11. Wheat -- 1983 and 1985 Export and Domestic Shipments from Duluth/Superior Ports.....	17
Figure 12. Soybeans -- 1983 and 1985 Export and Domestic Shipments from Duluth/Superior Ports.....	18
Figure 13. Minnesota Grain Production.....	20
Figure 14. Minnesota Corn Disappearance.....	22
Figure 15. Minnesota Soybean Disappearance.....	23
Figure 16. Twin Cities Terminal Elevator Grain Receipts.....	27
Figure 17. Duluth/Superior Terminal Elevator Grain Receipts.....	28
Figure 18. Minnesota Terminal Elevator Grain Receipts.....	29
Figure 19. Minnesota Department of Agriculture Crop Reporting Districts.....	30
Figure 20. Total Terminal Elevator Grain Shipments.....	32

# LIST OF TABLES

	Page
Table 1. All Commodities -- 1985 Receipts at Minnesota Terminal Elevators and Processors from Upper Midwest Country Elevators...	25
Table 2. All Commodities -- 1985 Minnesota Terminal Elevator Shipments to Out-of-State Destinations.....	31
Table 3. All Commodities -- 1985 Minnesota Country Elevator Shipments to Out-of-State Destinations by Crop Reporting District (CRD).....	34
Table 4. Minnesota Corn Production by Crop Reporting District.....	35
Table 5. Corn -- 1985 Receipts at Minnesota Terminal Elevators and Processors from Upper Midwest Country Elevators.....	37
Table 6. Corn -- 1985 Minnesota Terminal Elevator Shipments.....	39
Table 7. Corn -- 1985 Minnesota Country Elevator Shipments to Out-of-State Destinations by CRD.....	40
Table 8. Minnesota Wheat Production by Crop Reporting District, 1982-1985.....	42
Table 9. All Wheat -- 1985 Receipts at Minnesota Terminal Elevators and Processors.....	43
Table 10. All Wheat -- 1985 Minnesota Terminal Elevator Shipments to Out-of-State Destinations.....	45
Table 11. All Wheat -- 1985 Minnesota Country Elevator Shipments to Out-of-State Destinations by CRD.....	47
Table 12. Minnesota Soybean Production by Crop Reporting District.....	48
Table 13. Soybeans -- 1985 Receipts at Minnesota Terminal Elevators and Processors from Upper Midwest Country Elevators.....	50
Table 14. Soybeans -- 1985 Minnesota Terminal Elevator Shipments to Out-of-State Destinations.....	52
Table 15. Soybeans -- 1985 Minnesota Country Elevator Shipments to Out-of-State Destinations by CRD.....	53

## METRIC CONVERSION TABLE

Throughout this report, the units of measurement used are the metric ton and bushel. Metric tons are used as the common base when more than one grain is being considered. The bushel is the unit of measurement used when a single grain is being considered. A metric conversion table is shown below.

1 metric ton	= 2,204.6 pounds
1 metric ton	= 36.74 bushels of wheat
1 metric ton	= 36.74 bushels of soybeans
1 metric ton	= 39.368 bushels of corn
1 metric ton	= 39.368 bushels of flax
1 metric ton	= 39.368 bushels of rye
1 metric ton	= 45.93 bushels of barley
1 metric ton	= 68.894 bushels of oats
1 metric ton	= 78.736 bushels of sunflowers
1 million metric tons	= 39 million bushels of corn
5 million metric tons	= 197 million bushels of corn
10 million metric tons	= 394 million bushels of corn
15 million metric tons	= 591 million bushels of corn
20 million metric tons	= 787 million bushels of corn

## INTRODUCTION

This publication presents the results of a state-wide survey of grain movements during 1985. The study was completed in conjunction with the 1985 nationwide grain movements study under the North Central Regional Research Project NC-137 and the South Central Regional Research Project SC-176. This grain survey is also the fifth in a series of bi-annual statewide grain flow studies, beginning in 1977, completed in the Department of Agricultural and Applied Economics.

Grain flow questionnaires were received from country elevators, terminal elevators, grain processors and feed mills. The results of this survey were evaluated by using secondary data sources. These secondary sources can be found in the bibliography. The methods used for survey evaluation for the 1985 and grain flow surveys are explained in "An Economic Analysis of Minnesota Grain Flows: 1983," by Daniel W. Halbach, Master's Thesis, Department of Agricultural and Applied Economics, University of Minnesota.

Minnesota's grain movements changed considerably during the period from 1983 to 1985. Reduced export demand, larger grain production and storage levels, a continuing shift in export grain shipments from West European markets to Pacific Rim markets and higher levels of direct out-of-state shipments by unit trains called for continual adjustment in the state's transportation system. Temporarily reduced grain shipment levels led to reduced barge and rail rates and improved transportation equipment availability for grain shippers.

The availability of attractive rates for unit train shipments led many Minnesota country elevators to upgrade their grain storage and handling systems to allow unit train loading. The growth in the number of

Minnesota country elevators with the ability to load these unit trains was substantial. The number of these facilities in Minnesota has grown fivefold during the period 1974-1985. Unit train loading capability allowed these country elevators to ship grain directly to export or domestic destinations. Such shipments became more important with the increased exports of grain to the Pacific Rim countries through Pacific Northwest ports.

This study will present the export volume by destination for Gulf ports, Pacific ports and the Port of Duluth/Superior for all grains. These export shipments by port will also be given for Minnesota's three major grains: corn, all wheat and soybeans. Grain production and movements into, through or from Minnesota for corn, for all wheat (including durum) for soybeans and for total grains and oilseeds will be presented by transportation mode.

## MINNESOTA AND UNITED STATES GRAIN EXPORTS - 1983 AND 1985

The route Minnesota grain takes to export destinations depends on market conditions as well as the transportation situation. Minnesota is comparatively distant from major port areas, but its location allows route flexibility for grain export movements. Grain originating in or moving through Minnesota for export can be shipped through the ports on Gulf of Mexico, the Pacific Northwest, or Duluth/Superior. These three port areas exported a total of 73.6 million metric tons of grain in 1985. This was a reduction from the 103.3 million metric tons that the U.S. exported in 1983. In 1985, shipments from the Gulf of Mexico accounted for 57% of all grain exports, the Pacific Northwest accounted for 19%, and Duluth/Superior accounted for 3% of these shipments. The remainder of U.S. exports were shipped from other Lake ports, Atlantic Coast ports and by rail to Mexico and Canada.

Minnesota's share of grain exports totaled 7.9 million metric tons. This was approximately 11% of all exports from the Gulf, Pacific Northwest and Duluth/Superior port areas in 1985. In 1983, Minnesota's share of export grain was 17 million metric tons, or over 16% of these port areas total grain shipments. Corn, wheat, and soybeans were over 98% of all the grain exported in 1985. The maps for all commodities show export volume in metric tons. The maps for corn, wheat, and soybean movements are in bushels.

### Gulf of Mexico Ports

Total grain exports from the Gulf of Mexico are shown in Figure 1. Gulf shipments were 53.7 million metric tons in 1985, a reduction of 23.5 million metric tons from 1983. Minnesota's Gulf exports decreased from

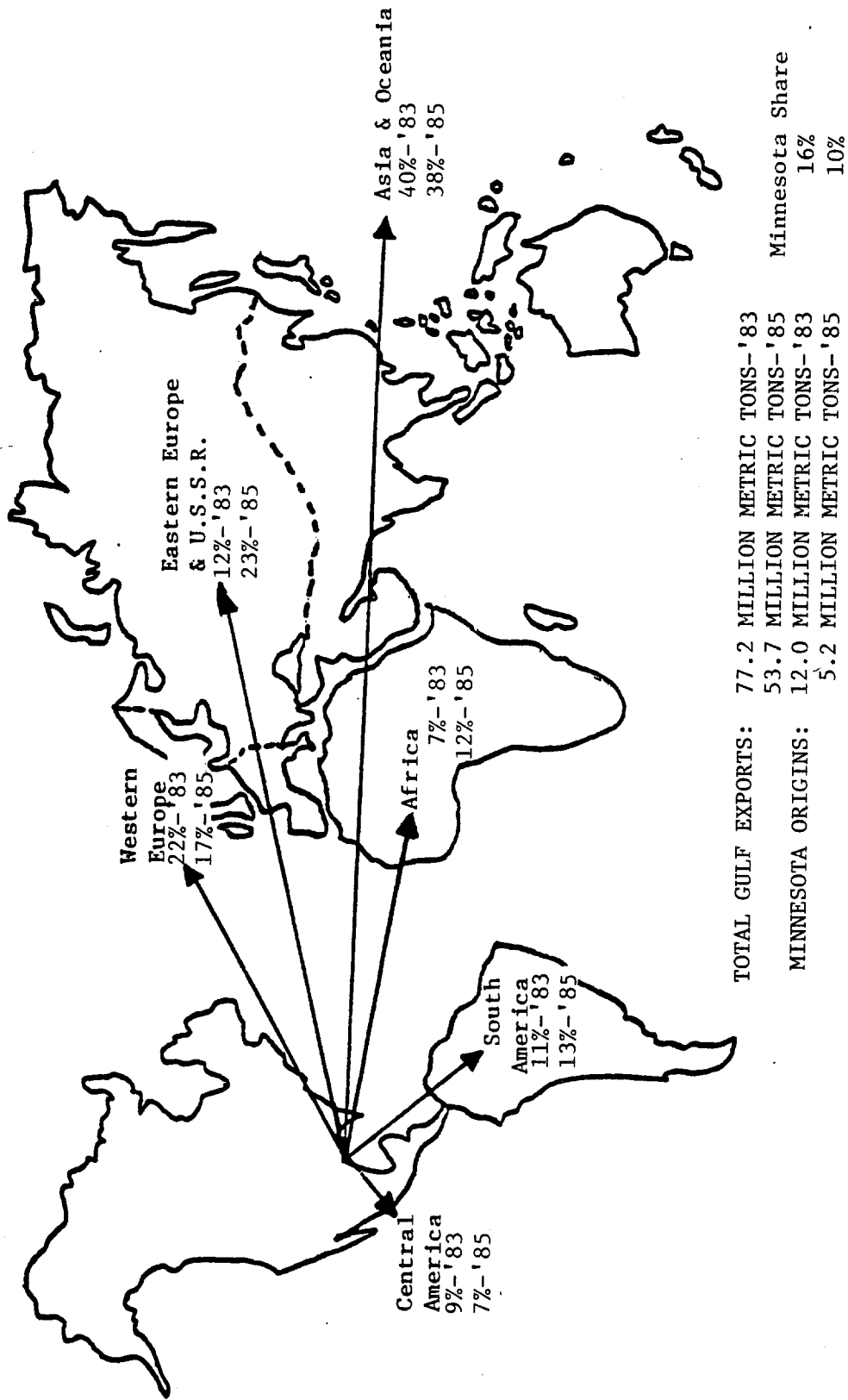


FIGURE 1  
ALL COMMODITIES  
1983 AND 1985 EXPORTS FROM GULF PORTS

Source: USDA, Inspection for Exports by Coastal Areas and Country of Destination.

12.0 million metric tons from 1983 to 5.2 million metric tons in 1985, a decline of over 50%. The state's percentage of total Gulf export shipments was reduced to 10% of the volume in 1985 from 16% in 1983. Total Gulf port exports destined for Eastern Europe and the Soviet Union increased by 3.1 million metric tons and increased in percentage of all exports to 23% in 1985 from 12% in 1983. Exports to Western Europe fell from 17.0 million metric tons or 22% in 1983 to 9.1 metric tons or 17% of all Gulf shipments in 1985.

Corn exports from the Gulf of Mexico are shown in Figure 2. Exports in 1985 were reduced from 1266.4 million bushels in 1983 to 1,081.2 million bushels in 1985. Minnesota's share of these exports declined from 18% of total volume in 1983 to 8% of all Gulf corn exports in 1985.

The most dramatic change in Gulf corn exports was a 318.5 million bushel increase in 1985 shipments to the Soviet Union and Eastern Europe. These shipments accounted for 40% of 1985 Gulf corn exports. Asia and Oceania's share decreased to 35% of all shipments in 1985, down from 52% in 1983 as a result of a reduction of 280.2 million bushels in exports to these countries from 1983 levels.

Gulf wheat exports are presented in Figure 3. Exports in 1985 of 475.4 million bushels were a reduction of 357.5 million bushels or 43% from 1983. Minnesota's Gulf export of wheat decreased by 51.2 million bushels from 1983, but its percentage share of the smaller U.S. total only decreased from 13% to 12%.

Unlike the corn exports in 1985, wheat sales to the USSR and Eastern Europe decreased 145.2 million bushels from 1983, accounting for 8% of total Gulf exports in 1985 down from 22% in 1983. Shipments to African

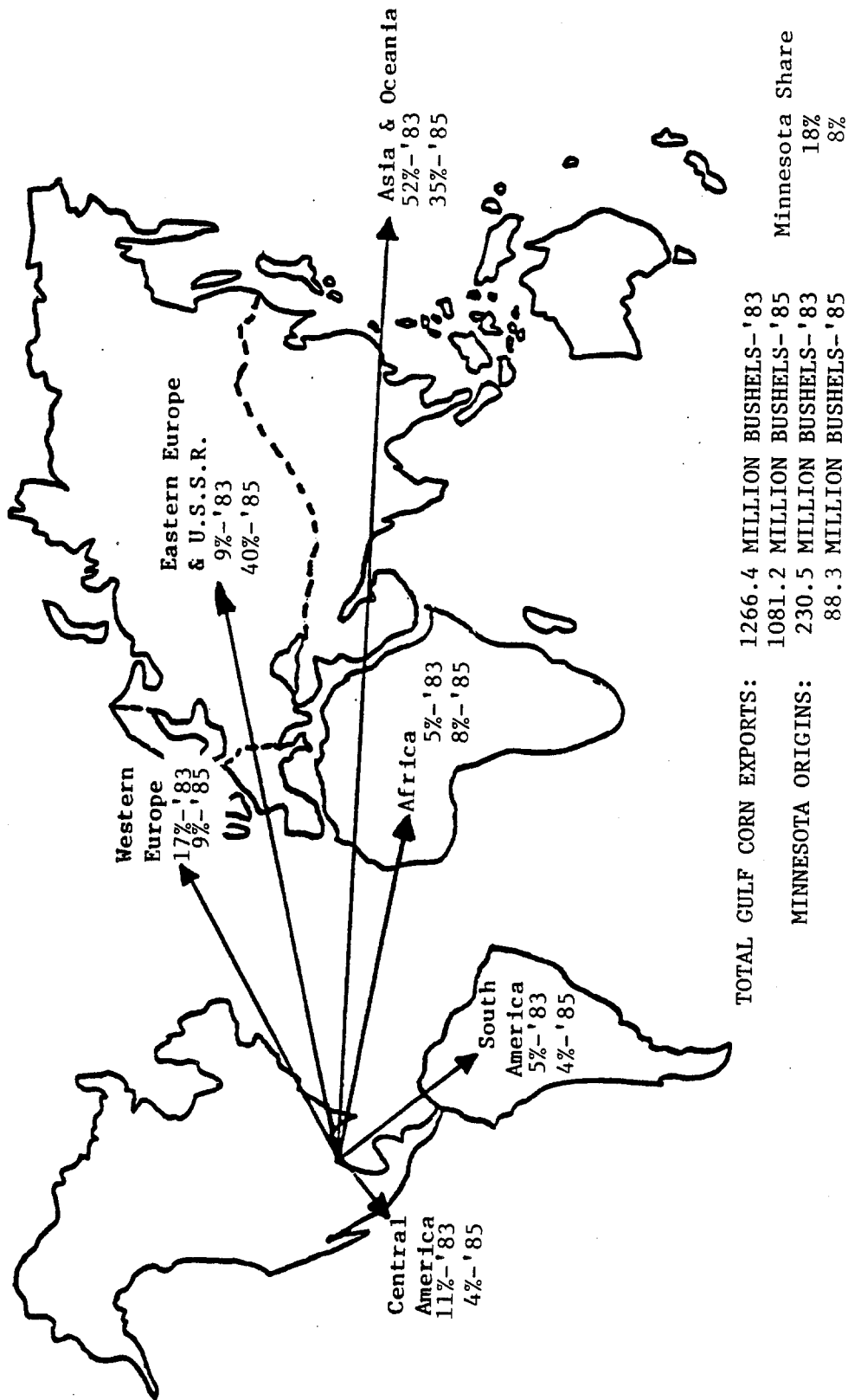


FIGURE 2  
CORN  
1983 AND 1985 EXPORTS FROM GULF PORTS

Source: USDA, Inspection for Exports by Coastal Areas and Country of Destination.

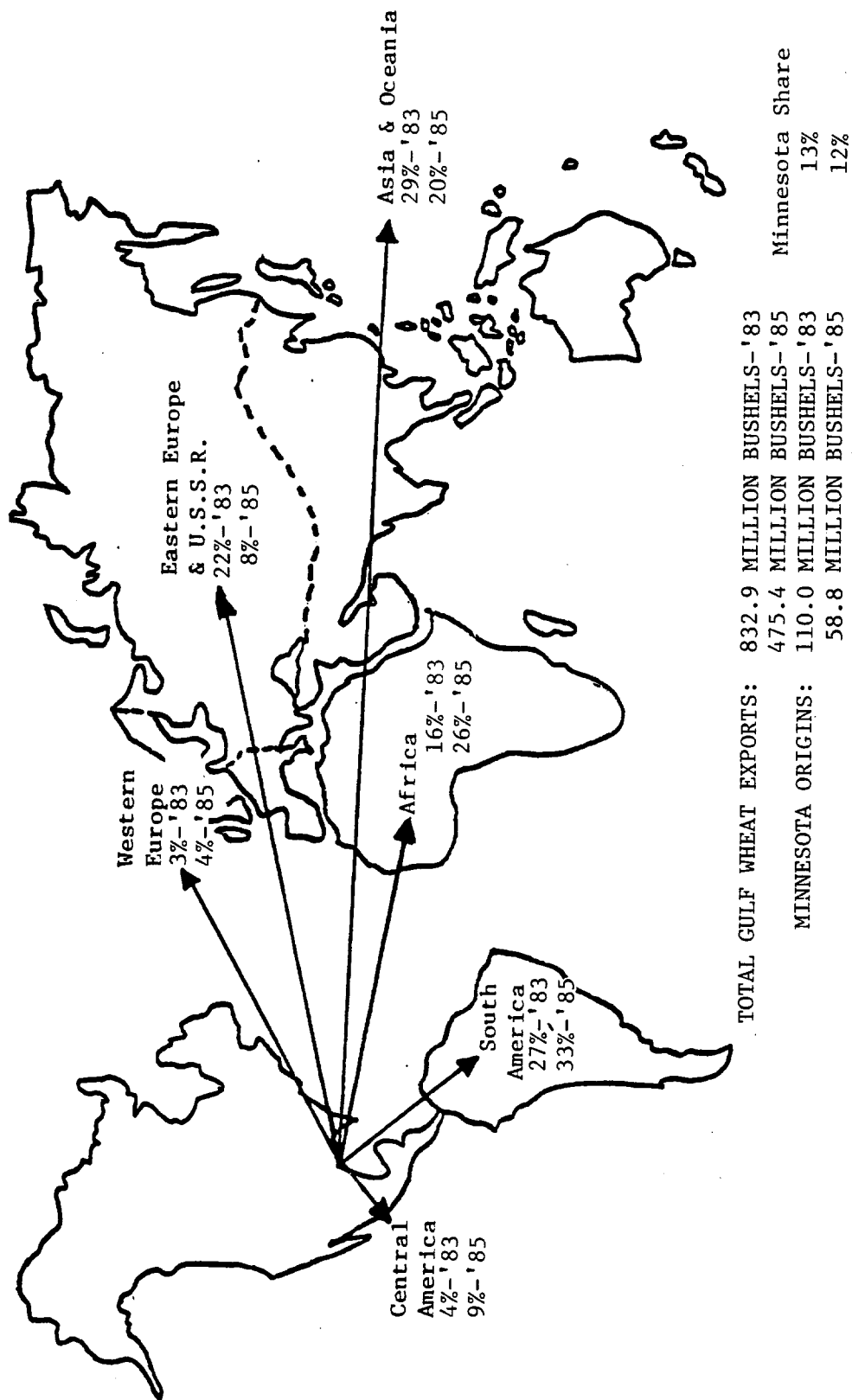


FIGURE 3  
WHEAT  
1983 AND 1985 EXPORTS FROM GULF PORTS

Source: USDA, Inspection for Exports by Coastal Areas and Country of Destination.

nations remained relatively constant in the volume 1985 when compared to 1983, resulting in a percentage share increase to 26% of all U.S. wheat shipments in 1985.

Figure 4 illustrates the flow of soybeans from the Gulf in 1983 and 1985. Total port area volume was reduced by 209.8 million bushels from 1983 to 490.4 million bushels in 1985. Minnesota's Gulf soybean exports also declined from 1983 to 47.8 million bushels, declining to 10% of the total Gulf shipments from 17% in 1983.

Western European soybean exports from the Gulf declined in volume to 166.5 million bushels in 1985, or 46% of the ports' 1985 soybean export movement. Gulf soybean shipments to Asia and Oceania increased to 45% of all exports, while declining in volume by 10.4 million bushels from 1983 levels.

#### Pacific Northwest Ports - 1983 AND 1985

Grain export volume for Pacific Northwest ports in 1985 is illustrated in Figures 5-8. These ports had a 3 million metric ton decline in total export shipments from 1983 levels. This was a much smaller relative change in volume than Gulf of Mexico ports experienced in this period. Asia and Oceania received the largest share of grain from these ports, accounting for 92% of all shipments in 1983 and 95% of all shipments in 1985. Export shipments in 1985 to Asia and Oceania declined by 2.2 million metric tons from 1983 levels.

Corn exports from Pacific ports are shown in Figure 6. All corn exports from these ports were to Asia and Oceania. The total volume of corn through Pacific ports increased from 221.8 million bushels in 1983 to 290.6 million bushels in 1985, reflecting an increases in demand for

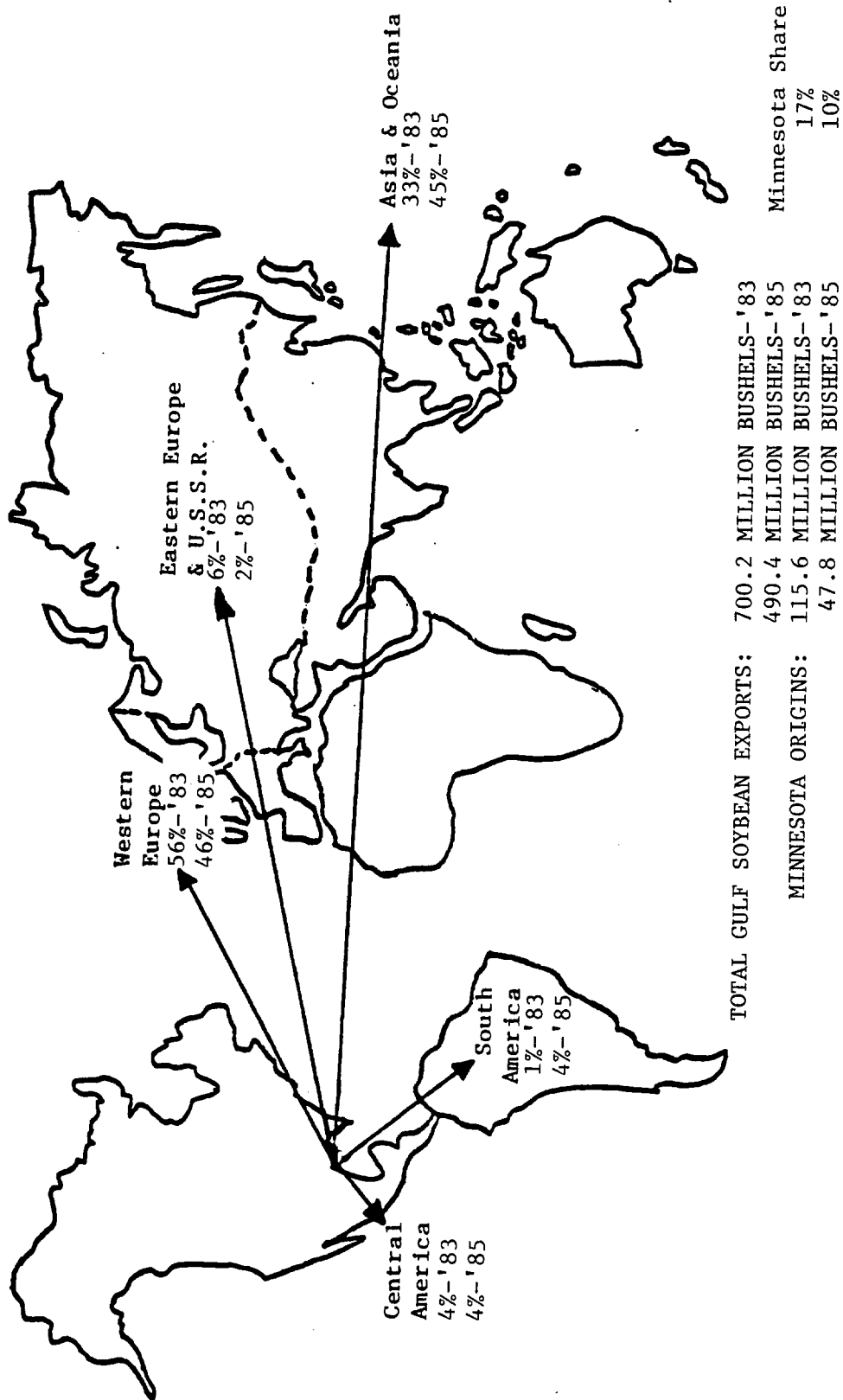


FIGURE 4  
SOYBEANS

1983 AND 1985 EXPORTS FROM GULF PORTS

Source: USDA, Inspection for Exports by Coastal Areas and Country of Destination.

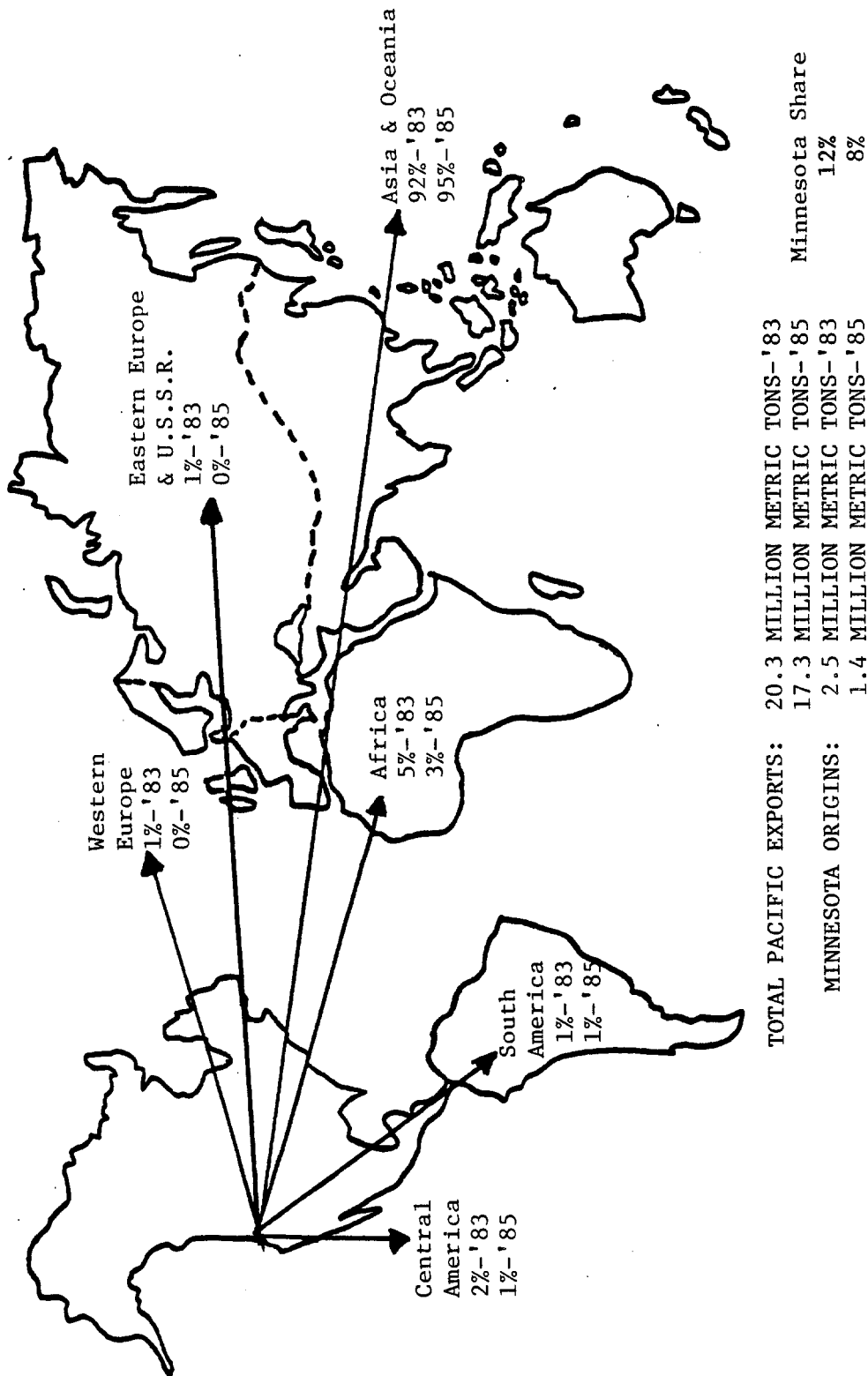


FIGURE 5  
ALL COMMODITIES  
1983 AND 1985 EXPORTS FROM PACIFIC\* PORTS

\*Includes California Ports.

Source: USDA, Inspection for Exports by Coastal Areas and Country of Destination.

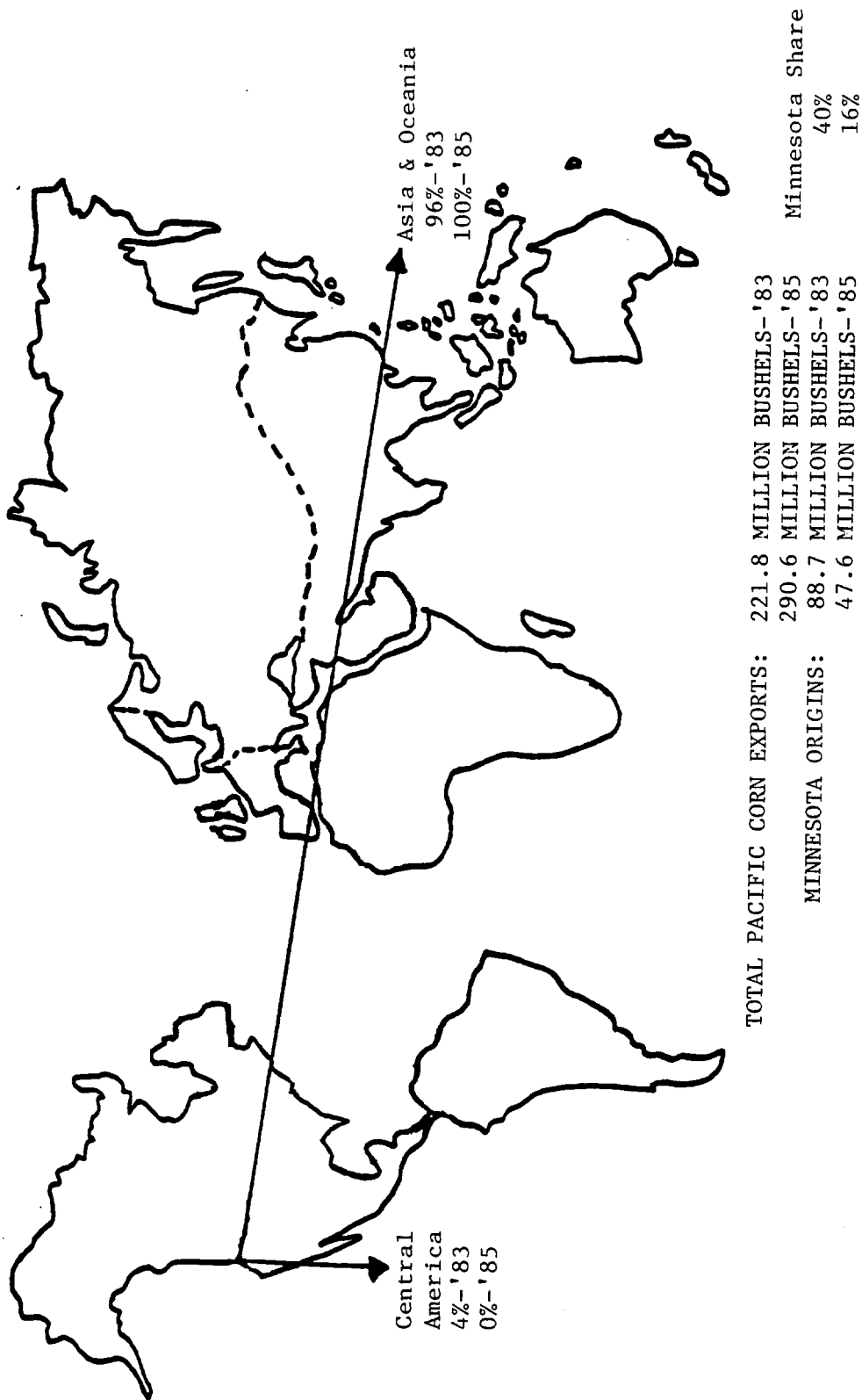
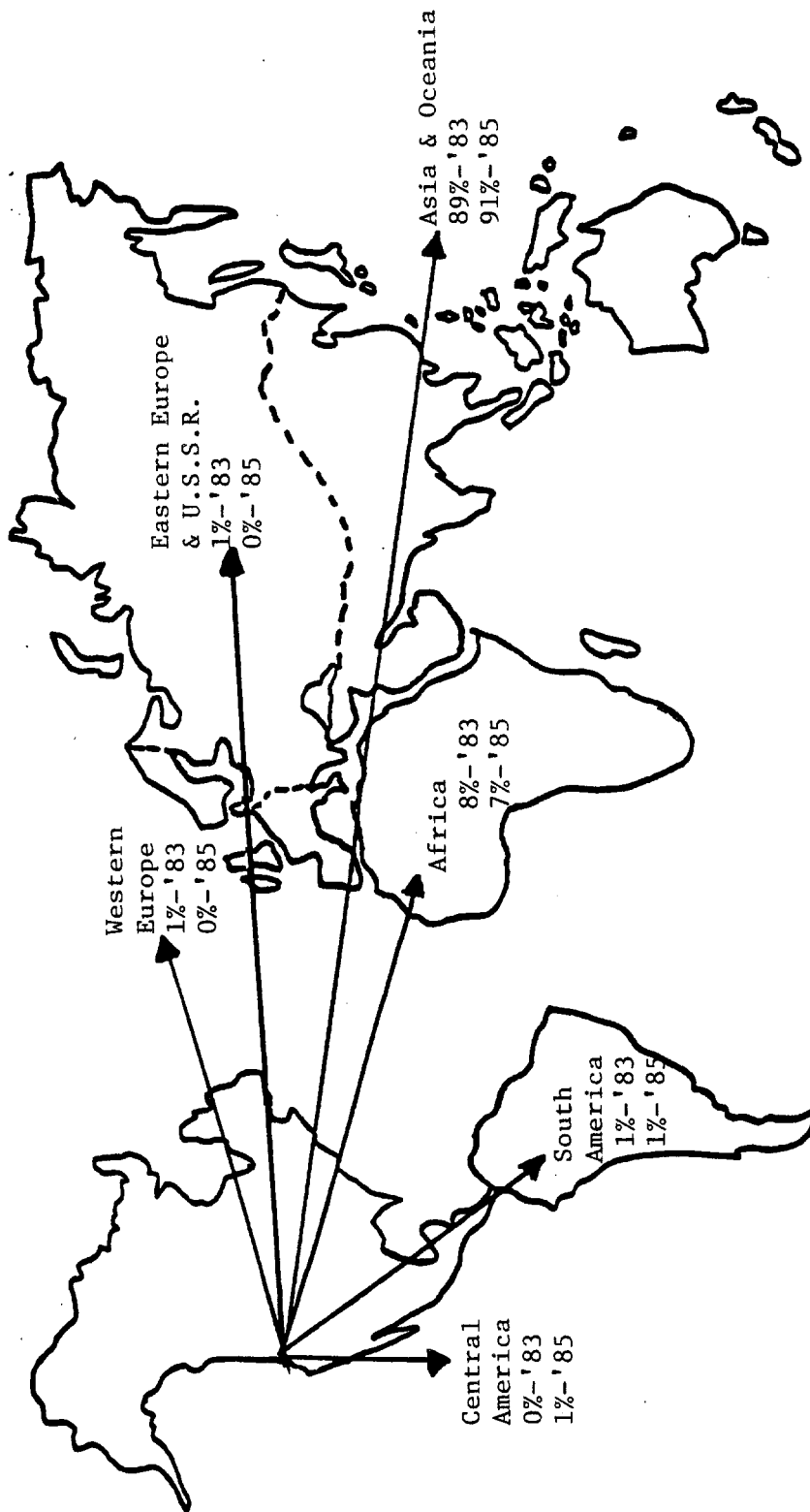


FIGURE 6  
CORN  
1983 AND 1985 EXPORTS FROM PACIFIC\* PORTS

\*Includes California Ports.

Source: USDA, Inspection for Exports by Coastal Areas and Country of Destination.

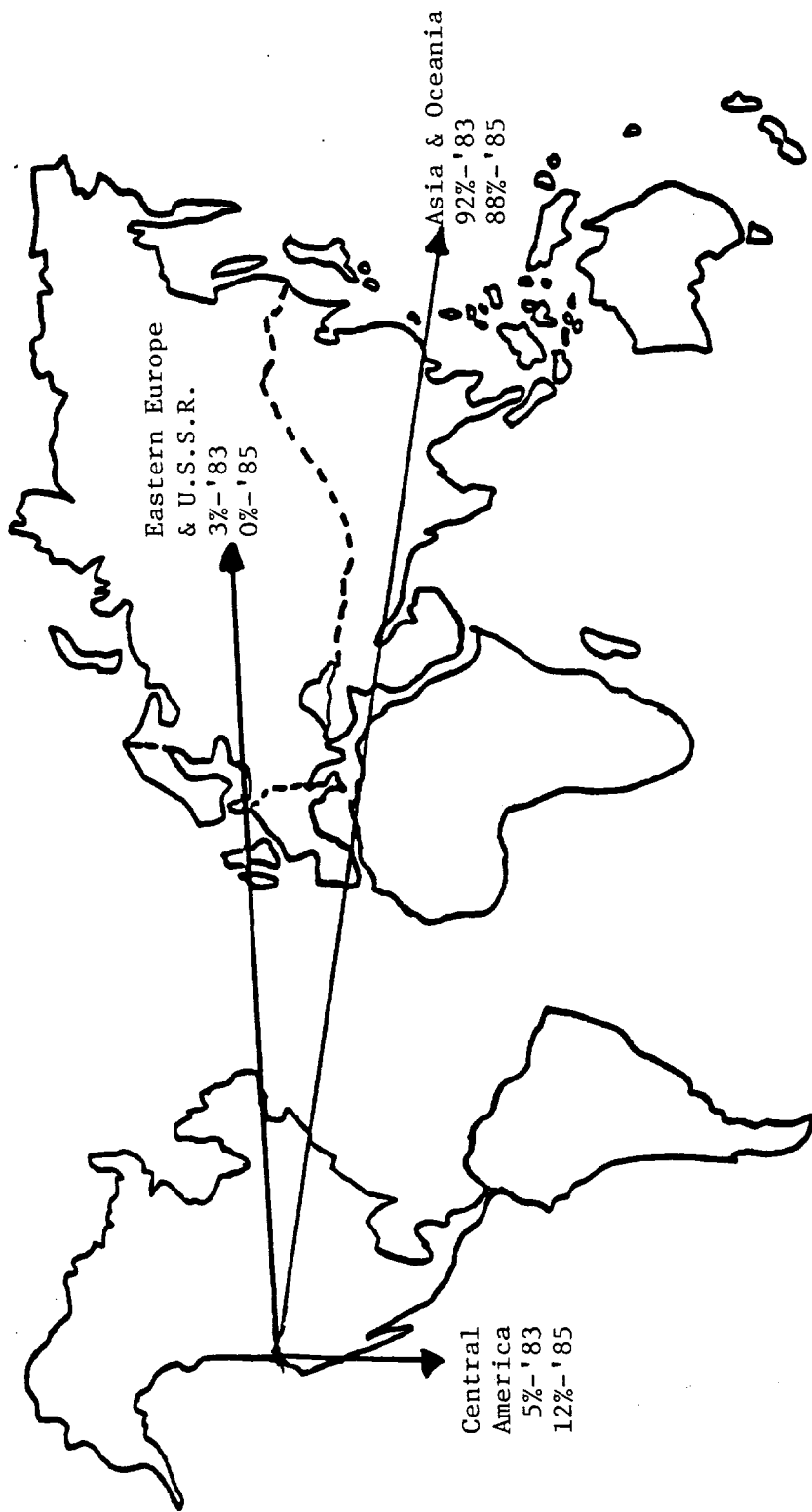


TOTAL PACIFIC WHEAT EXPORTS:	446.4 MILLION BUSHELS-'83	Minnesota Share
	306.9 MILLION BUSHELS-'85	0%
MINNESOTA ORIGINS:	0 MILLION BUSHELS-'83	
	1.8 MILLION BUSHELS-'85	1%

FIGURE 7  
WHEAT  
1983 AND 1985 EXPORTS FROM PACIFIC\* PORTS

\*Includes California Ports.

Source: USDA, Inspection for Exports by Coastal Areas and Country of Destination.



TOTAL PACIFIC SOYBEAN EXPORTS:	28.7 MILLION BUSHEL-'83	Minnesota Share
	18.6 MILLION BUSHEL-'85	17%
MINNESOTA ORIGINS:	4.9 MILLION BUSHEL-'83	31%
	5.8 MILLION BUSHEL-'85	

FIGURE 8  
SOYBEANS  
1983 AND 1985 EXPORTS FROM PACIFIC\* PORTS

\*Includes California Ports.

Source: USDA, Inspection for Exports by Coastal Areas and Country of Destination.

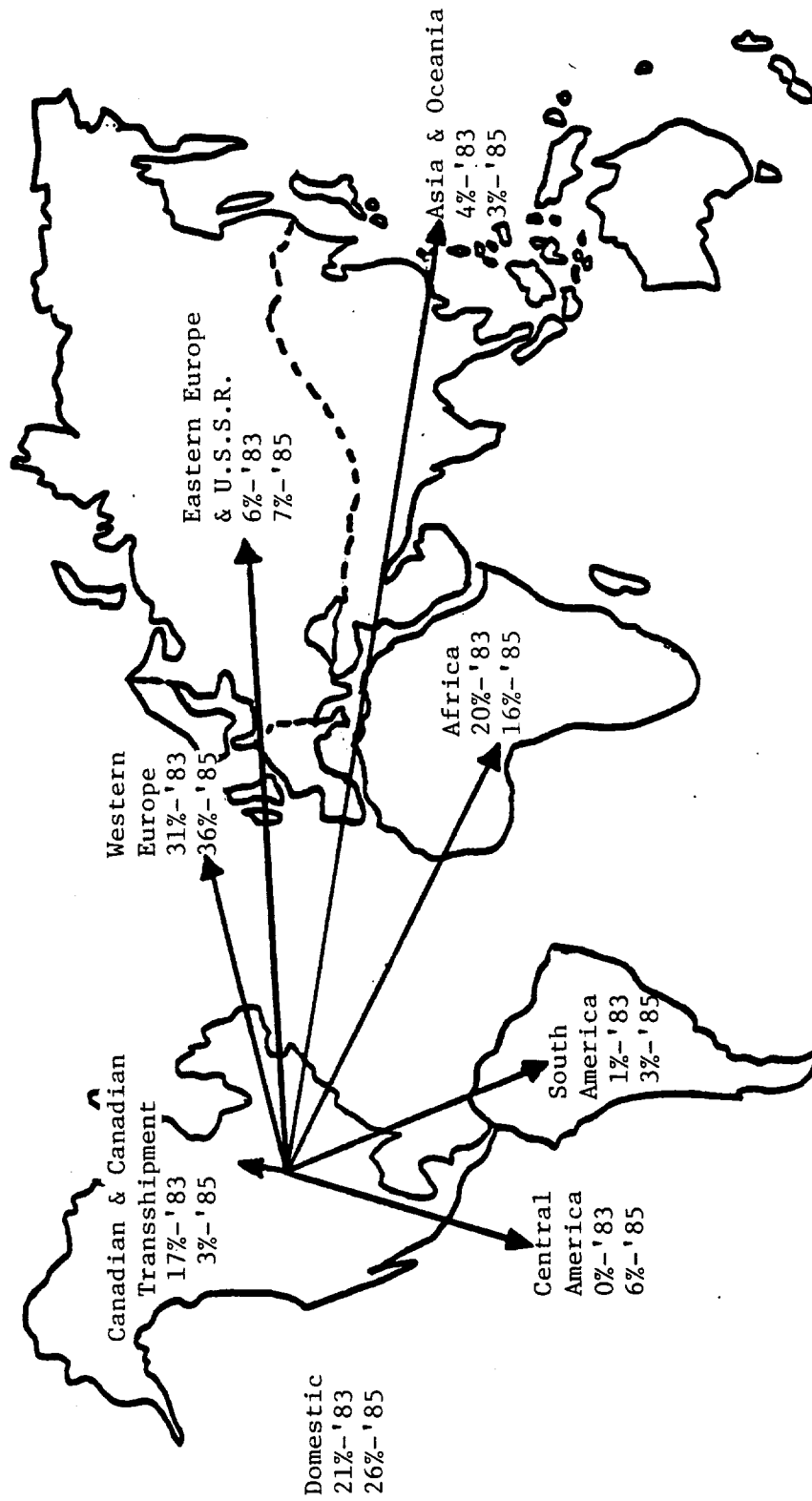
feedgrains in Pacific Rim and other Asian nations. Exports with Minnesota origins from these ports, however, decreased substantially from 1983, both in volume and as a percentage of Pacific Northwest (PNW) corn movements, to 16% in 1985.

Wheat exports from the Pacific Northwest were markedly lower than 1983 levels in 1985 with volume at 306.9 million bushels down 31%. Shipments to Asia and Oceania increased slightly in the percentage of movements to 91% of all wheat exports in 1985. Pacific ports were not a major destination area for Minnesota wheat, as only 1.8 million bushels of PNW wheat exports had Minnesota origins.

Soybean exports from the Pacific Northwest in 1985 decreased from 28.7 million bushels in 1983 to 18.6 million bushels in 1985. Most of these shipments were to Asia and Oceania. The percentage of shipments to Central America increased to 12% of PNW soybean exports in 1985. These shipments were primarily to Mexico. Minnesota's share of soybean exports from the Pacific Northwest increased by 1.1 million bushels, giving so with Minnesota origins amounted to 31% of PNW movements.

#### Port of Duluth/Superior

Though Duluth/Superior experienced lower shipment volume in 1985, the port, which shipped 2.6 million metric tons of grain in 1985, remains an important market for Upper Midwest grain. Figure 9-12 show the distribution of grain from Duluth/Superior. Domestic shipments, primarily to Eastern U. S. wheat millers, were 26% of all movements in 1985. The majority of Duluth/Superior shipments to Canada were transferred to ocean vessels for movement to export destinations. In 1985, Western Europe

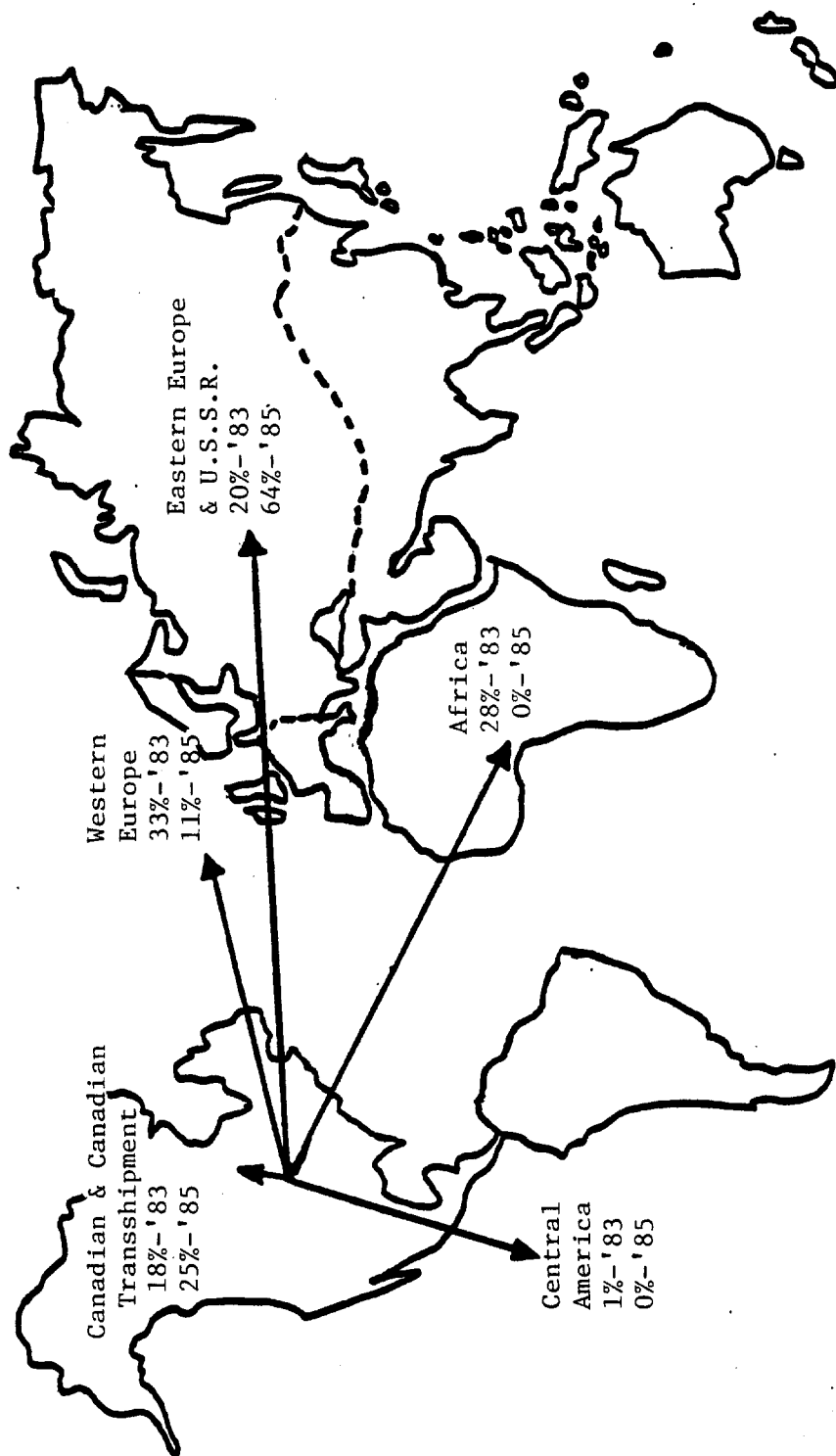


TOTAL DULUTH/SUPERIOR SHIPMENTS:	5.9 MILLION METRIC TONS-'83
	2.6 MILLION METRIC TONS-'85
MINNESOTA ORIGINS:	2.5 MILLION METRIC TONS-'83
	1.3 MILLION METRIC TONS-'85

Minnesota Share	42%
	50%

FIGURE 9  
ALL COMMODITIES  
1983 AND 1985 EXPORT AND DOMESTIC SHIPMENTS  
FROM DULUTH/SUPERIOR PORTS

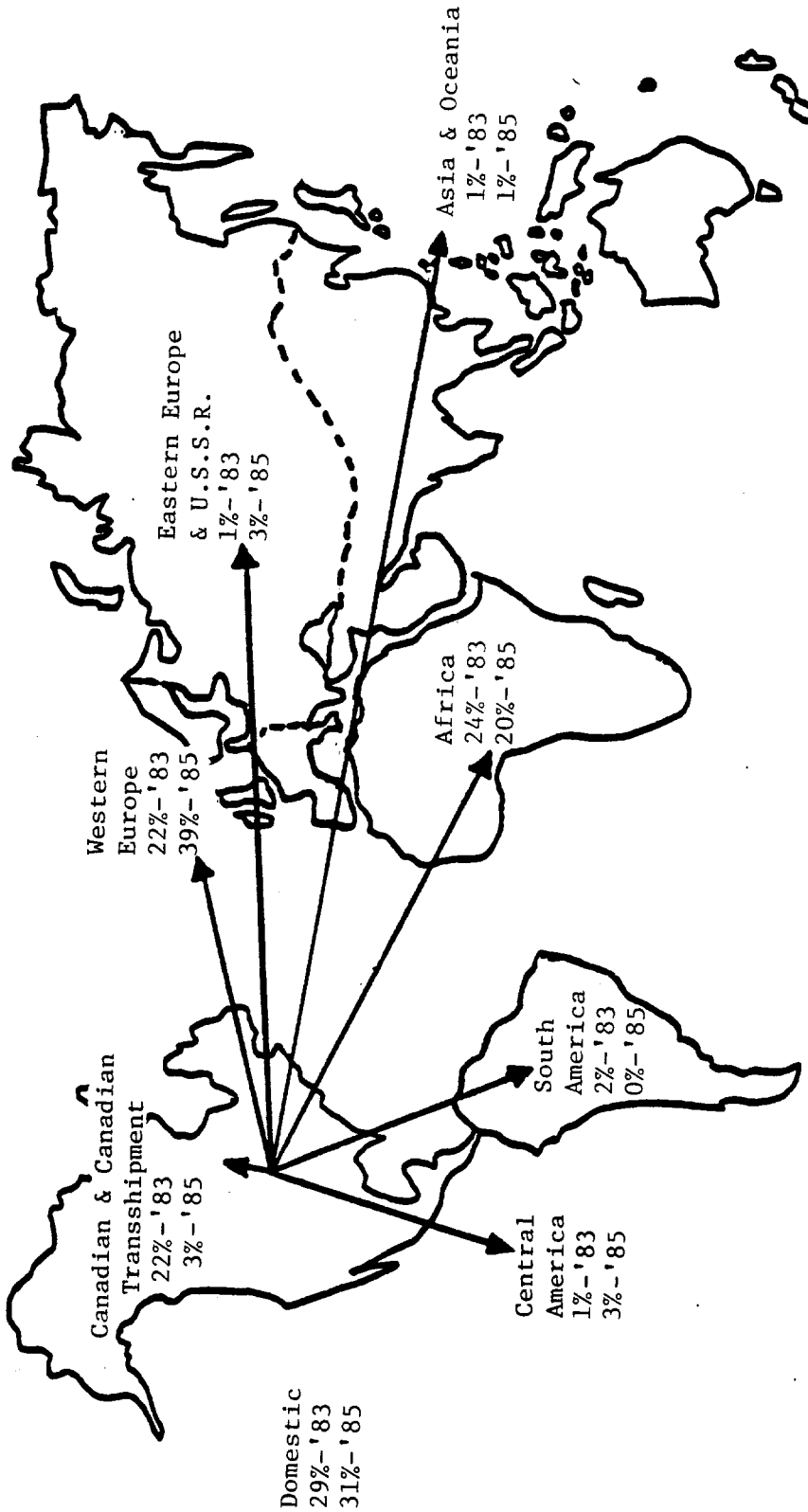
Sources: Minneapolis Grain Exchange Statistical Annual. Total Grain and Seed/By-Product Shipments, Port of Duluth/Superior, Guthrie-Hubner, Inc.



TOTAL DULUTH/SUPERIOR CORN EXPORTS:		21.9 MILLION BUSHELS-'83	Minnesota Share
		3.2 MILLION BUSHELS-'85	97%
MINNESOTA ORIGINS:		21.3 MILLION BUSHELS-'83	74%
		2.4 MILLION BUSHELS-'85	

FIGURE 10  
CORN  
1983 AND 1985 EXPORT AND DOMESTIC SHIPMENTS  
FROM DULUTH/SUPERIOR PORTS

Sources: Minneapolis Grain Exchange Statistical Annual. Total Grain and Seed/By-Product Shipments, Port of Duluth/Superior, Guthrie-Hubner, Inc.



TOTAL DULUTH/SUPERIOR WHEAT SHIPMENTS: 140.0 MILLION BUSHEL- '83

Minnesota Share  
30%  
50%

MINNESOTA ORIGINS:  
75.7 MILLION BUSHEL- '85  
41.5 MILLION BUSHEL- '83  
37.7 MILLION BUSHEL- '85

FIGURE 11  
WHEAT  
1983 AND 1985 EXPORT AND DOMESTIC SHIPMENTS  
FROM DULUTH/SUPERIOR PORTS

Sources: Minneapolis Grain Exchange Statistical Annual. Total Grain and Seed/By-Product Shipments, Port of Duluth/Superior, Guthrie-Hubner, Inc.

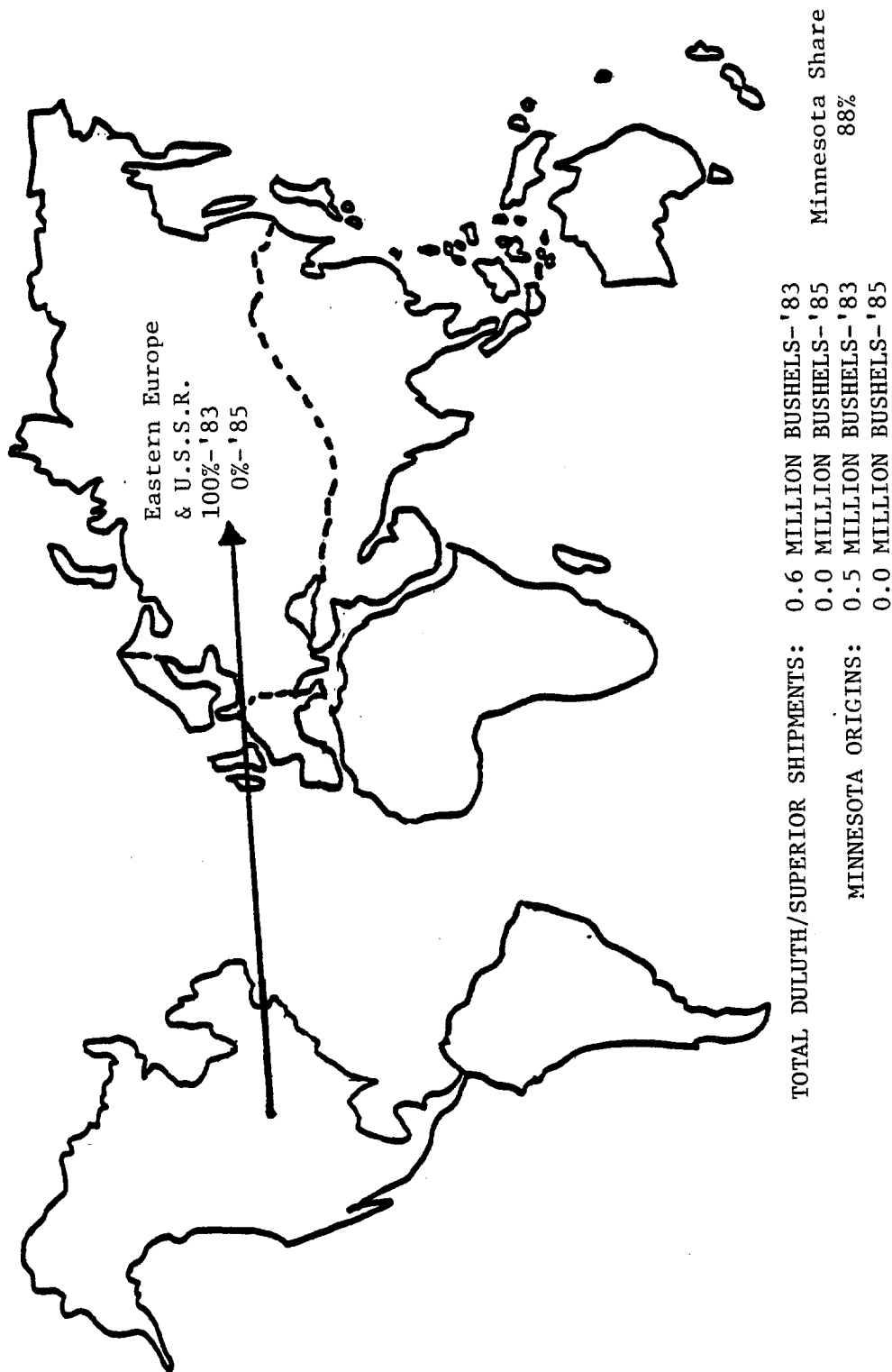


FIGURE 12  
SOYBEANS  
1983 AND 1985 EXPORT AND DOMESTIC SHIPMENTS  
FROM DULUTH/SUPERIOR PORTS

Sources: Minneapolis Grain Exchange Statistical Annual. Total Grain and Seed/By-Product Shipments,  
Port of Duluth/Superior, Guthrie-Hubner, Inc.

received 36% of all grain shipments from Duluth/Superior, while exports to African nations were 16% of total shipments.

Corn shipments from Duluth/Superior decreased precipitously from 21.9 million bushels in 1983 to 3.2 million bushels in 1985. The Soviet Union and Eastern Europe received 64% of corn export volume in 1985. Corn shipments to Western Europe and Africa in 1985 were also significantly reduced from 1983 levels. Exports with Minnesota origins were 74% in 1985, down from 97% in 1983.

Duluth/Superior wheat shipments declined from 140.0 million bushels in 1983 to 75.7 million bushels in 1985. Wheat shipments with Minnesota origins decreased to 37.7 million bushels in 1985, though Minnesota's percentage share increased to 50%. Shipments to domestic users, primarily to Buffalo, New York, accounted for 31% of all wheat shipments. Western Europe was the largest purchaser of export wheat from Duluth/Superior, receiving 39% of total port wheat shipments. African nations received 20% of the port's shipment wheat volume in 1985.

Soybean shipments from Duluth/Superior were negligible in 1985, a reduction from .6 million bushels in 1983. The 1983 export volume consisted of export sales to the Soviet Union, of which 88% of the soybeans had Minnesota origins.

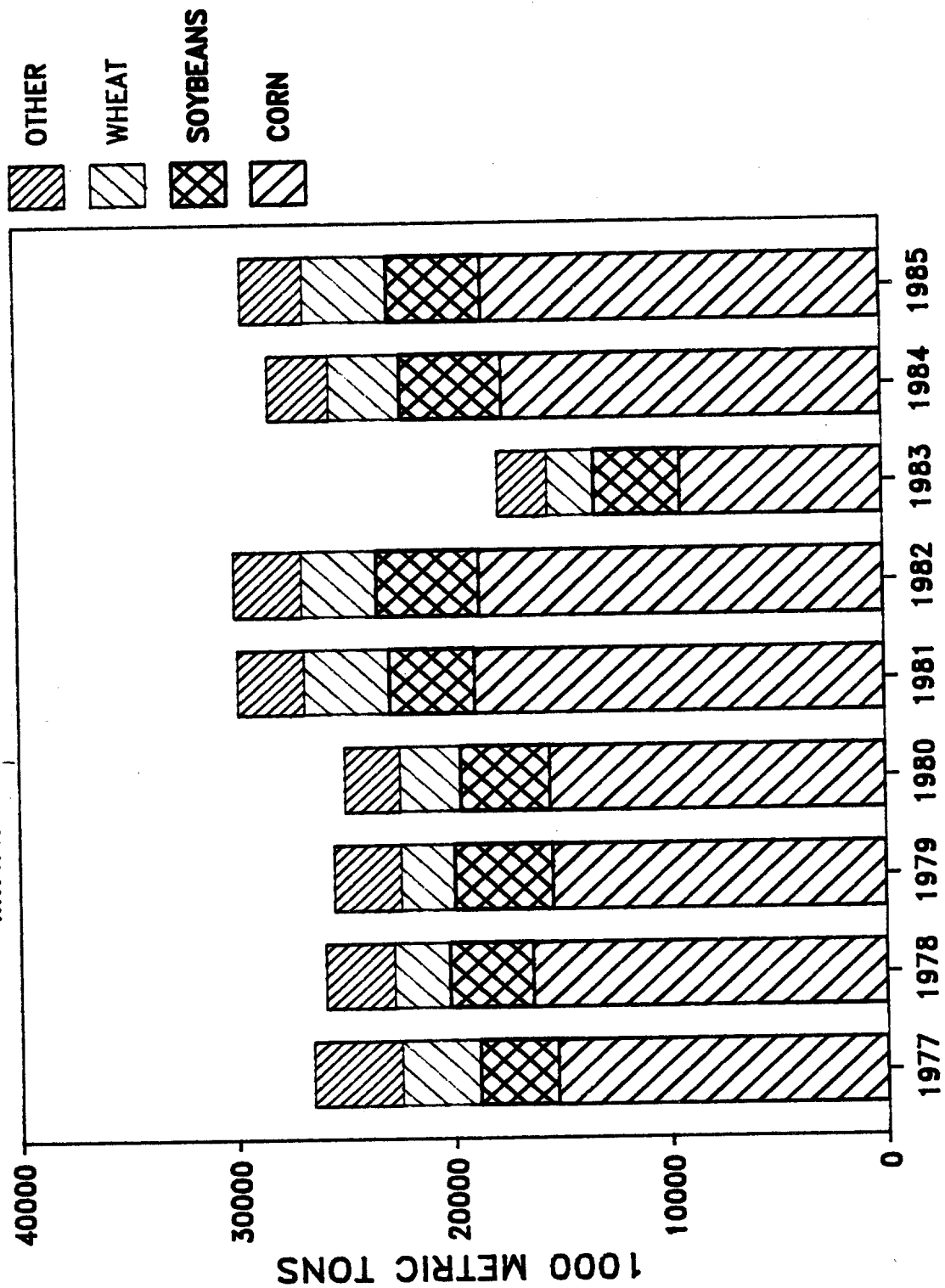
#### MINNESOTA GRAIN MOVEMENTS - 1983 AND 1985

##### All Commodities

##### A) Production and Use of Grain.

Minnesota farms produced 29.5 million metric tons of grain in 1985. This grain production is illustrated for selected years in Figure 13. In

# FIGURE 13 MINNESOTA GRAIN PRODUCTION



Source: Minnesota Agricultural Statistics.

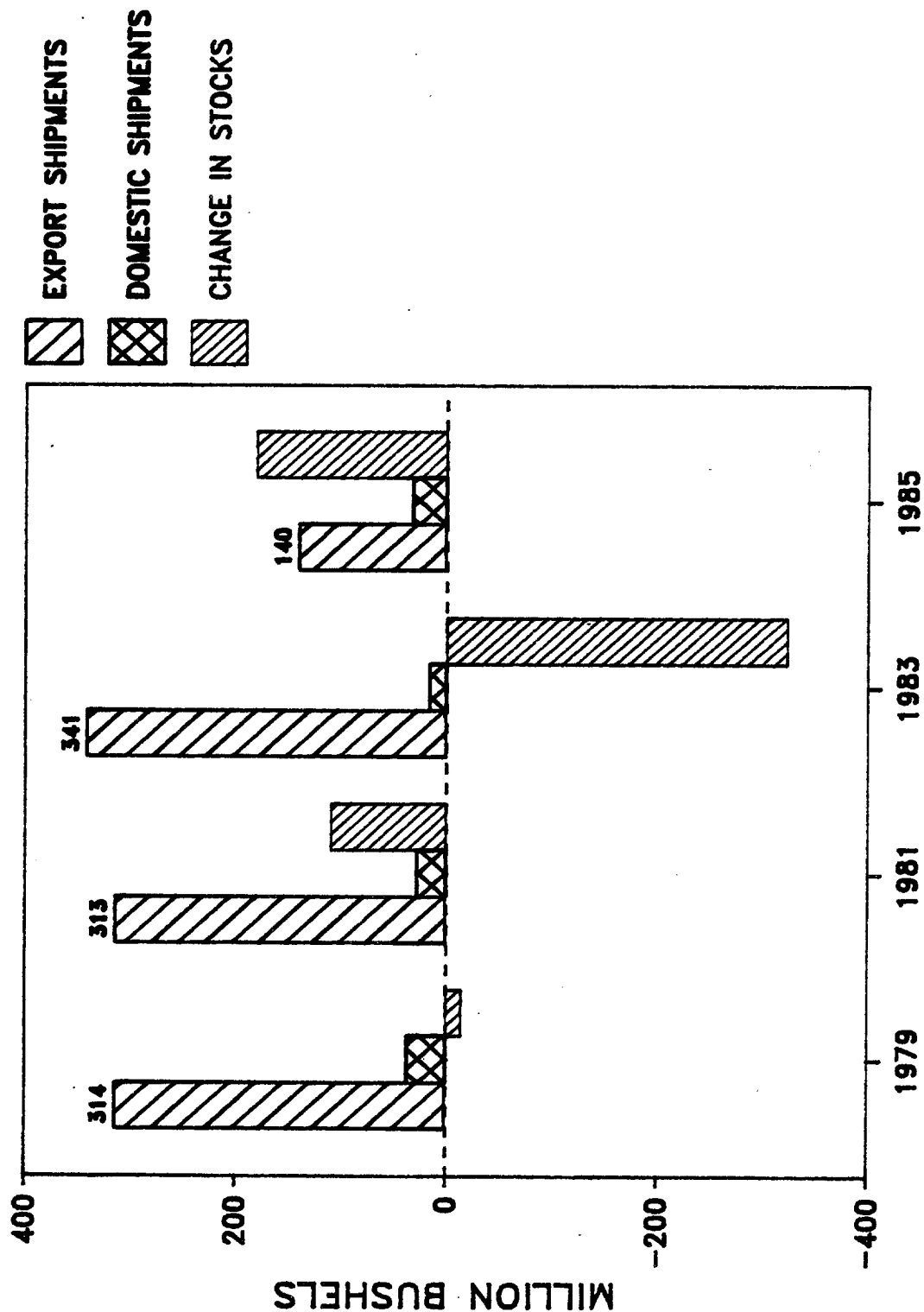
1985 corn, wheat and soybeans accounted for over 90% of the state's grain production. Individually, corn accounted for 62%, soybeans 15% and wheat 13% of total grain production in 1985. This grain was either stored on the farm, used as livestock feed, held in inventories, processed and consumed in Minnesota, or shipped out-of-state as grain or in a processed form.

Figures 14 and 15 illustrate Minnesota corn and soybean production and disappearance in 1983 and 1985. Wheat was not included in a similar figure because of the difficulty in determining the final use of wheat received from other states, which accounted for 76% of all terminal elevator and processor wheat receipts in 1985.

Minnesota's grain transportation system must adjust to production and policy shifts in domestic and international markets. The USDA'S 1983 Payment in Kind (PIK) program, coupled with widespread dry conditions and strong worldwide demand, had considerable influence on grain movements in 1983 and in subsequent years. The impact of the PIK program and the drought can be seen by the drop in 1983 corn production to 377.4 million bushels from 734.5 million bushels in 1982. The result was a stock reduction of 367.7 million bushels of corn. Soybean production in 1983 was 147.2 million bushels down from 171.5 million bushels in 1982 with a stock reduction of 54 million bushels. This drawdown in stocks was followed by the storage of large amounts of 1984 and 1985 grain production which replenished stocks.

Minnesota exports of corn were 139.9 million bushels in 1985, down from 340.6 million bushels in 1983. Soybean exports from Minnesota were 54.9 million bushels in 1985 down from 121.1 million bushels in 1983.

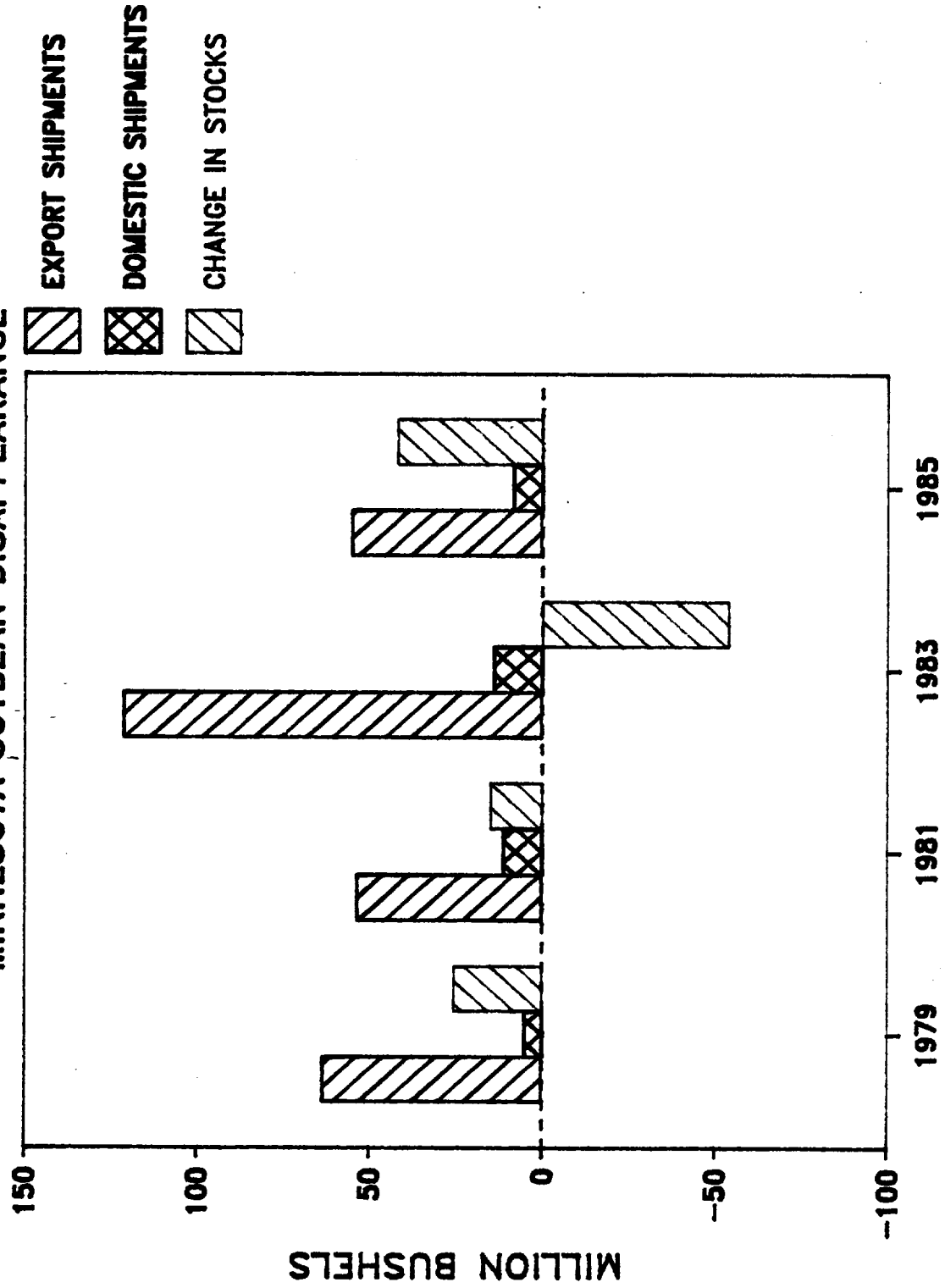
# FIGURE 14 MINNESOTA CORN DISAPPEARANCE



Source: Minnesota Agricultural Statistics.

# FIGURE 15

## MINNESOTA SOYBEAN DISAPPEARANCE



Source: Minnesota Agricultural Statistics.

The reduction in exports was of considerable importance for grain movements in the state. Shipments of corn and soybeans to other states (Domestic Shipments), in state processing and feed, seed or other use remained relatively constant in volume from 1983 to 1985.

B) Receipts of All Grains by Minnesota Terminal Elevators and Processors.

Minnesota's country, subterminal and terminal elevators face continuously changing optimal destination and transportation mode choices for grain shipments. The levels of these shipments are the focus of this and the following sections which will examine the following grain movements:

1. Receipts at Minnesota terminal elevators and processors.
2. Shipments from Minnesota terminal elevators.
3. Direct shipments from country elevators and subterminals to out-of-state destinations.

Table 1 lists total grain receipts by terminal elevators and processors in the Twin Cities area, Duluth/Superior and other processors in the state. The total 1985 volume was 18.4 million metric tons, a drop from 26.2 million metric tons in 1983. Twin Cities receipts, which include river terminals in Red Wing and Winona, accounted for 66% of these receipts (12 million metric tons) in 1985. Duluth/Superior terminal elevators received 24% of this volume (4.4 million metric tons) in 1985. The "Other Minnesota" category includes processors outside the Twin Cities or Duluth/Superior areas, and received the remaining 10% (1.9 million metric tons) of grain in 1985.

TABLE 1  
ALL COMMODITIES  
1985 RECEIPTS AT MINNESOTA TERMINAL ELEVATORS AND PROCESSORS  
FROM UPPER MIDWEST COUNTRY ELEVATORS  
(1,000 metric tons)

ORIGIN	DESTINATIONS										TOTAL
	Twin Cities		Duluth/Superior				Other Minnesota				
	RAIL	TRUCK	TOTAL	RAIL	TRUCK	TOTAL	RAIL	TRUCK	TOTAL		
Minnesota											
Northwest	522	252	774	813	385	1,198	30	11	41	2,013	32
West Central	480	723	1,203	69	.48	70	27	302	329	1,603	64
Central	31	1,384	1,415	19	3	22		113	113	1,550	97
East Central	16	24	41			0			0	41	60
Southwest	400	320	720	32		32	90	442	532	1,285	59
South Central	425	1,071	1,496			0	88	405	493	1,989	74
Southeast	9	477	486			0		22	22	508	98
Subtotal	1,893	4,252	6,135	934	388.48	1,323	235	1,295	1,530	8,988	66
Out-of-State											
North Dakota	2,458	1,212	3,670	2,252	433.53	2,686	7	294	301	6,657	29
South Dakota	1,426	612	2,038	404		404		74	74	2,516	27
Iowa	31	173	204			0			0	204	85
Wyoming	54										
Montana	93										
Nebraska	3										
Wisconsin	3										
Subtotal	4,069	1,997	5,913	2,656	433.53	3,090	7	368	375	9,377	30
TOTAL	5,952	6,249	12,048	3,590	822.01	4,412	242	1,663	1,905	18,365	47

Source: University of Minnesota Grain Flow Survey

Minnesota terminal elevators and processors received 51% (9.4 million metric tons) of their grain volume from other states. North and South Dakota accounted for 9.2 million metric tons of these receipts. Of these receipts from other states, terminal elevators and processors in the Twin Cities received 5.9 million metric tons, Duluth/Superior received 3.1 million metric tons, and other Minnesota processors received .4 million metric tons from outside the state.

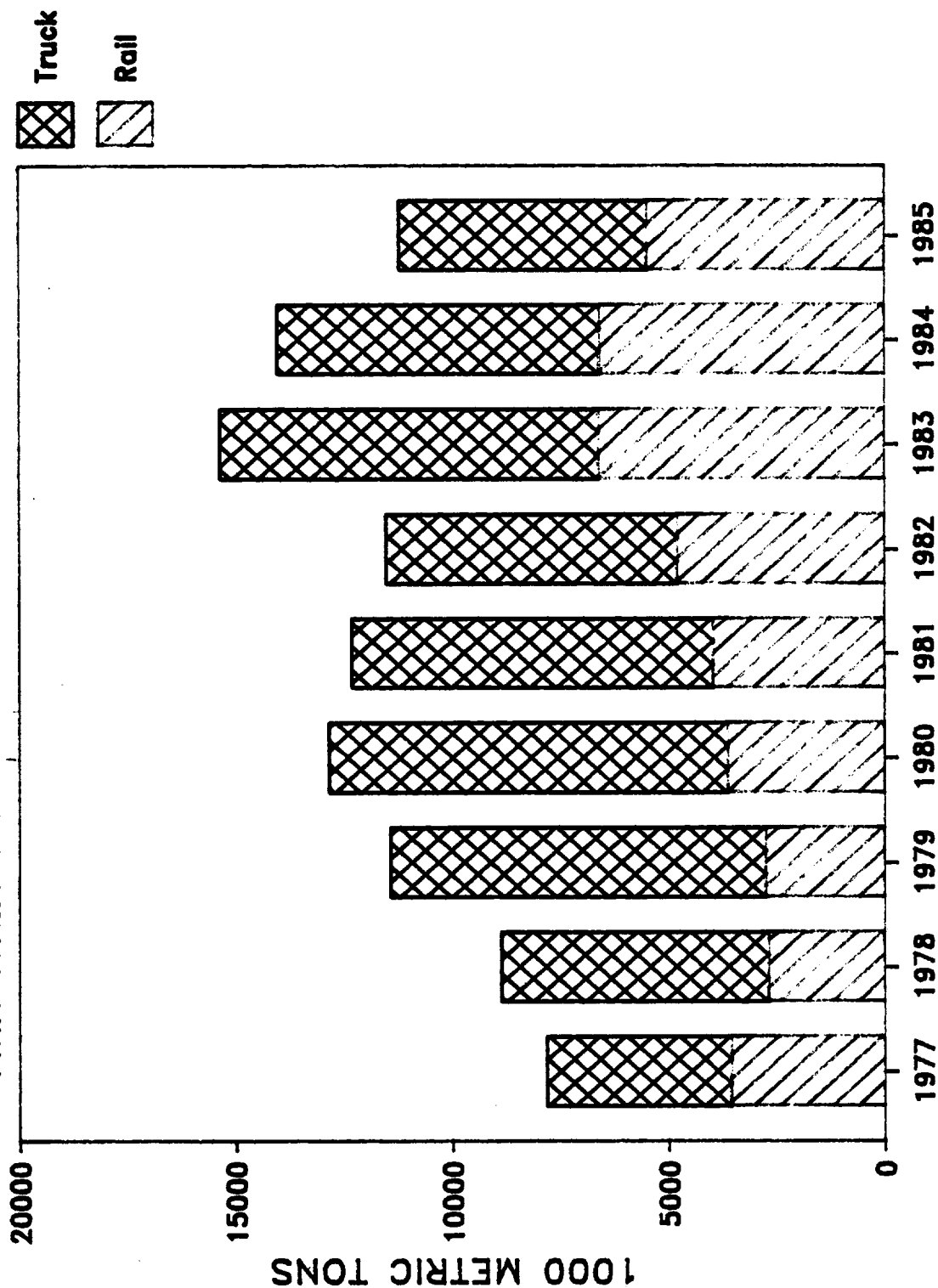
Terminal elevator grain receipts by mode for 1985 are also given in Table 1 and are illustrated by Figure 16 and Figure 17. Rail receipts in the Twin Cities increased to 49% of total receipts from 43% in 1983. Duluth/Superior rail receipts were 81% in 1985, up from 75% in 1983. Figure 18 illustrates total Minnesota terminal elevator grain receipts in 1983 and 1985. The 1985 breakdown between rail (53%) and truck (47%) remained unchanged from 1983, though rail's share of these movements has been increasing since the late 1970s. Table 1, in addition to later tables, refer to the Minnesota Department of Agriculture's Crop Reporting Districts (CRDs). These districts are illustrated in Figure 19.

#### C) Minnesota Terminal Elevator Grain Shipments.

Grain shipments from terminal elevators are listed in Table 2 and illustrated by mode in Figure 20. Total terminal elevator shipments were 11.8 million metric tons in 1985, down from 20.9 million metric tons in 1983. Gulf ports received 5 million metric tons of grain from Minnesota terminals in 1985, which was 42% of all Minnesota terminal shipments. All of these shipments were by barge from the Twin Cities. Almost 80% (2 million metric tons) of the shipments from Duluth/Superior were for export by vessel in 1985. Rail increased its share of terminal elevator

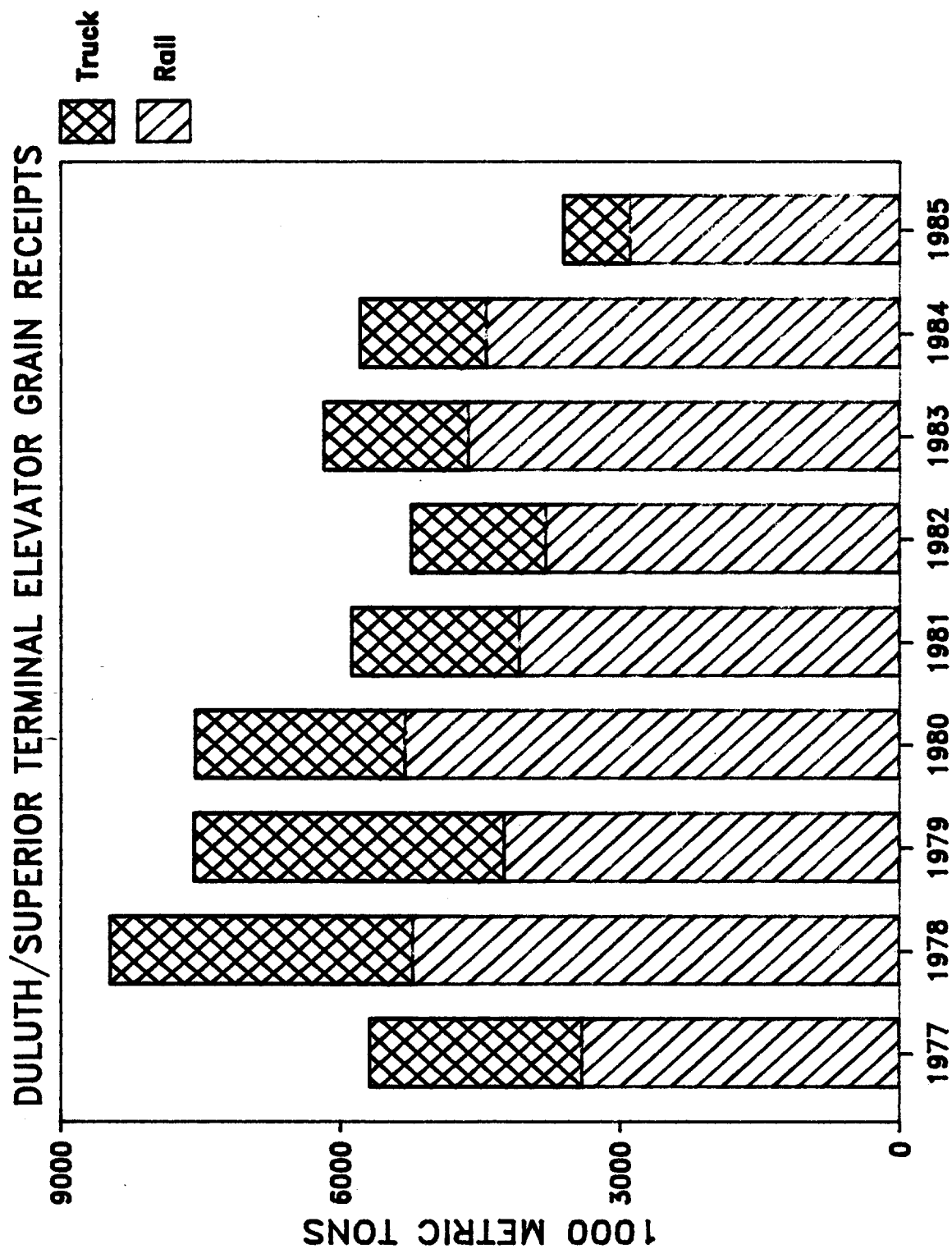
# FIGURE 16

## TWIN CITIES TERMINAL ELEVATOR GRAIN RECEIPTS



Source: Minneapolis Grain Exchange Statistical Annual

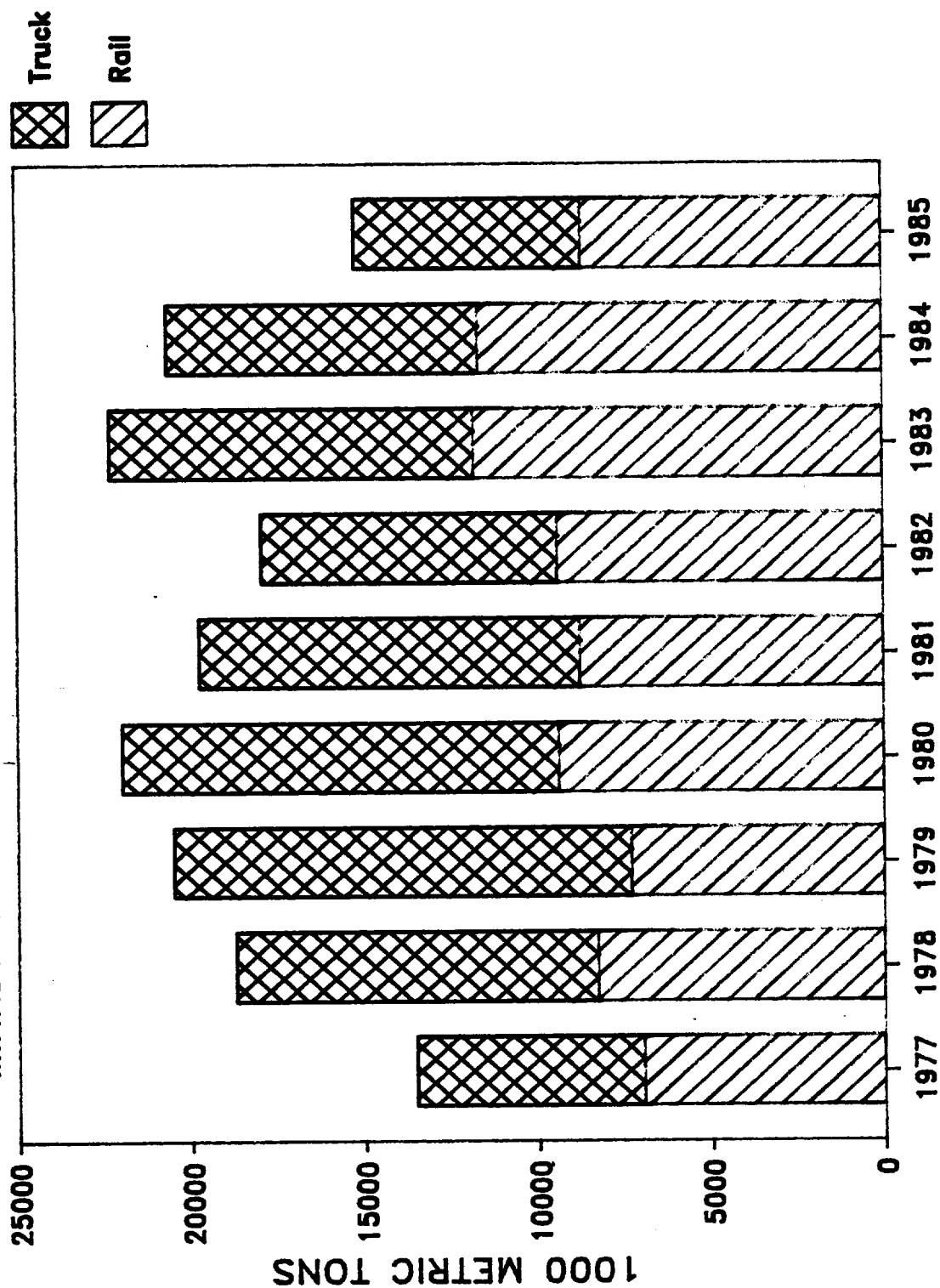
# FIGURE 17



Source: Minneapolis Grain Exchange Statistical Annual.

# FIGURE 18

MINNESOTA TERMINAL ELEVATOR GRAIN RECEIPTS



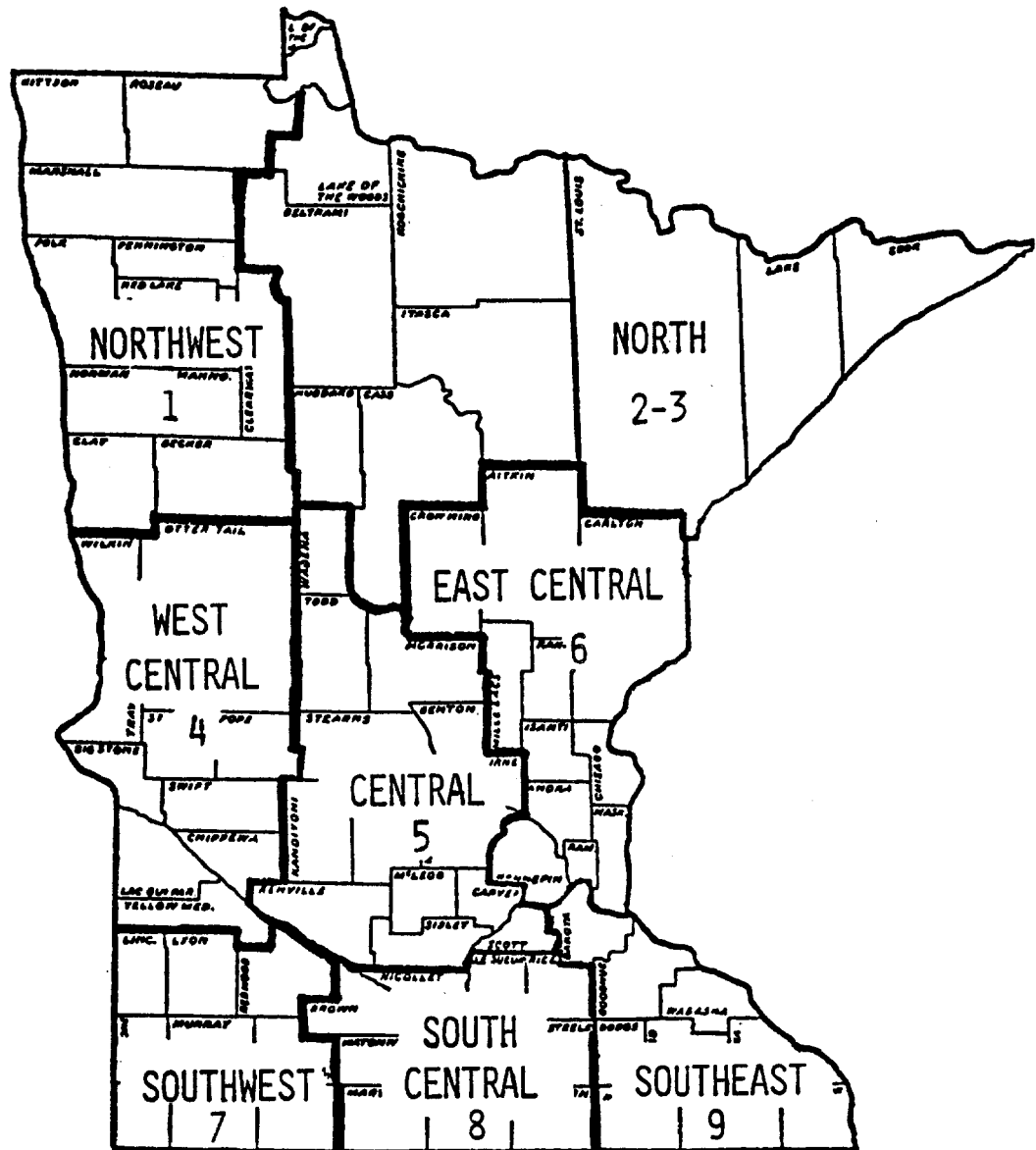


Figure 19. Minnesota Department of Agriculture  
Crop Reporting Districts<sup>1/</sup>.

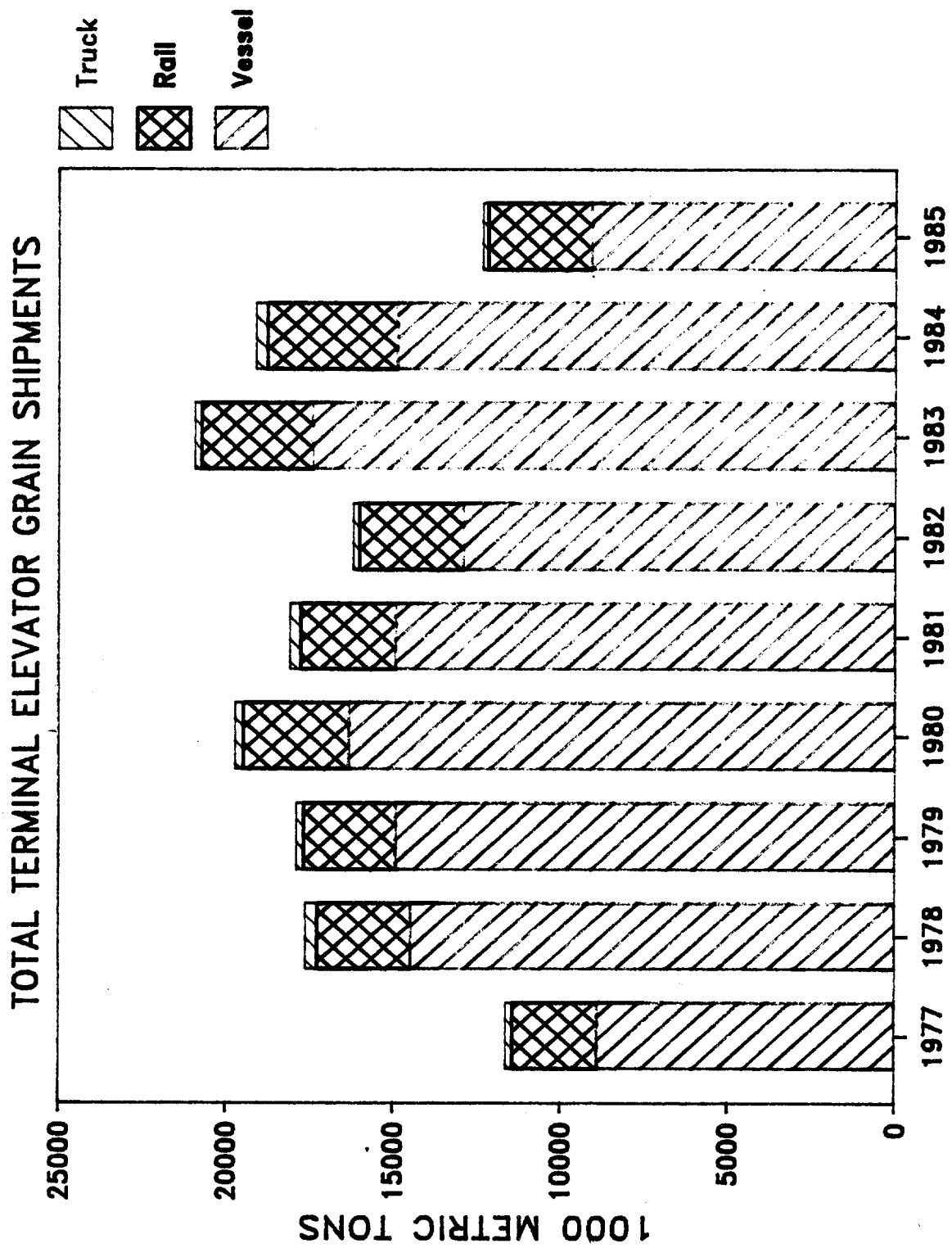
<sup>1/</sup> Crop Reporting Districts 2 and 3 have been combined.

TABLE 2  
ALL COMMODITIES  
1985 MINNESOTA TERMINAL ELEVATOR SHIPMENTS TO OUT-OF-STATE DESTINATIONS  
(1000 metric tons)

ORIGIN	DESTINATIONS										TOTAL	PERCENT	
	Gulf	Export	PNW	Misc.	Ill.	South	Mo.	East	Ind.	Iowa			
TWIN CITIES													
Rail	0	0	0	113	642	725	369	44	250	6	67	2,216	26%
Truck	0	0	0	0	88	0	0	0	0	0	11	99	1%
Barge	5,004	0	0	0	1	130	791	72	12	41	22	6,073	72%
Sub Total	5,004	0	0	113	731	855	1,160	116	262	47	100	8,368	
DULUTH/SUPERIOR													
Rail	0	0	0	0	30	298	17	0	351	9	0	705	21%
Truck	0	0	0	0	1	0	0	0	0	0	0	1	0%
Vessel	0	2,038	0	0	0	0	0	0	691	0	0	2,729	79%
Sub Total	0	2,038	0	0	31	298	17	0	1,042	9	0	3,435	
TOTAL													
Rail	0	0	0	113	672	1,023	386	44	601	15	67	2,921	25%
Truck	0	0	0	0	89	0	0	0	0	0	11	100	1%
Water	5,004	2,038	0	0	1	130	791	72	703	41	22	8,802	74%
TOTAL	5,004	2,038	113	113	762	1,153	1,177	116	1,304	56	100	11,823	
PERCENT	42%	17%		1%	6%	10%	10%	1%	11%	0%	1%		

Source: University of Minnesota Grain Flow Survey

# FIGURE 20



Source: Minneapolis Grain Exchange Statistical Annual.

shipments to 25% in 1985 from 18% in 1983, while shipments by vessel or barge declined to 74% from 85% in 1983. Terminal elevators in the Twin Cities shipped 72% (6.1 million metric tons) of all grain shipments by barge, while Duluth/Superior terminal elevators shipped 79% (2.7 million metric tons) of all grain shipments by vessel in 1985.

D) Minnesota Country Elevator Shipments Directly to Out-of-State Destinations.

Direct country elevator shipments to out-of-state destinations consisted primarily of unit train shipments to export loading areas. These shipments are shown in Table 3. The Pacific Northwest received 63% of these direct shipments (1.3 million metric tons), the bulk of which was corn. Of all shipments, 90% were by rail, reflecting the importance of unit train loading in Minnesota. The West Central (CRD 4) and the Southwest (CRD 7) districts accounted for 1.6 million metric tons of these shipments (76%). These districts have a locational advantage for Pacific Northwest shipments and a disadvantage relative to other districts for shipments to the Twin Cities or Duluth/Superior.

Minnesota Corn Movements

A) Production.

Corn accounted for 62% of all grain production in Minnesota in 1985. Corn production in 1985 totaled 724.5 million bushels, up from 689 million bushels in 1984 and 367 million bushels in the drought and PIK year 1983. The district with the greatest corn production in 1985 was the South Central (CRD 8), followed by the Southwest (CRD 7), and the West Central (CRD 4). Minnesota's 1982-1985 corn production and stock changes are given in Table 4.

TABLE 3  
ALL COMMODITIES  
1985 MINNESOTA COUNTRY ELEVATOR SHIPMENTS TO OUT OF STATE DESTINATIONS BY CRO  
(1,000 metric tons)

ORIGIN	DESTINATIONS										TOTAL	% RAIL	% TRUCK
	PNW	Gulf	Iowa	Wisc.	N. Dak.	Other Midwest	Canada	Cal.					
NORTHWEST	51	39	0	54	27	9	0	0	180	93	7		
RAIL	51	39		48	20	9			167				
TRUCK				6	7				13				
WEST CENTRAL	733	20	4	11	50	0	21	0	839	92	8		
RAIL	733	20	3	11			9		776				
TRUCK			1		50		12		63				
CENTRAL	38	0	6	1	0	0	0	0	45	84	16		
RAIL	38								38				
TRUCK			6	1					7				
SOUTHWEST	481	113	79	0	0	75	0	19.48	768	88	12		
RAIL	481	113				63		19.48	677				
TRUCK			79			12			91				
SOUTH CENTRAL	19	3	25	41	0	161	0	0	249	96	4		
RAIL	19	3	22	35		161			240				
TRUCK			3	6					9				
SOUTHEAST	0	0	20	12	0	1	0	0	33	0	100		
RAIL									0				
TRUCK			20	12		1			33				
TOTAL	1,322	175	134	119	77	246	21	19.48	2,113				
% RAIL	100	100	18	79	26	95	44	100	90				
%TRUCK	0	0	82	21	74	5	56	0	10				

Source: University of Minnesota Grain Flow Survey

TABLE 4  
MINNESOTA CORN PRODUCTION BY CROP REPORTING DISTRICT  
1982-1985  
(1,000 BUSHELS)

District	1982	1983	% Change From 1982	1984	% Change From 1983	1985	% Change From 1984
Northwest	7,901	6,552	-17%	9,659	47%	6,365	-34%
West Central	97,435	46,452	-52%	81,924	76%	92,149	12%
Central	147,893	72,250	-51%	130,357	80%	146,465	12%
East Central	25,591	16,734	-35%	24,735	48%	28,938	17%
Southwest	148,736	69,097	-54%	134,695	95%	149,899	11%
South Central	188,333	88,406	-53%	187,314	112%	191,183	2%
Southeast	117,485	66,952	-43%	119,307	78%	108,772	-9%
TOTALS	734,500	367,080	-50%	689,080	88%	724,500	5%
STOCK CHANGE	189,217	-364,718		44,332		180,791	

Source: Minnesota Agricultural Statistics

Since large amounts of corn are fed to livestock on or near the farms where it is produced, there can be substantial differences between a regions corn production and its quantity marketed. This feed use, as well as the existence of large amounts of on farm corn storage capacity, can cause year to year estimates of corn movements to vary greatly.

B) Minnesota Terminal Elevator and Processor Corn Receipts.

The 1985 corn receipts by Minnesota terminal elevators and processors can be found in Table 5. Most of this corn (87%) had Minnesota origins. Iowa and North Dakota each shipped more than 8 million bushels of corn to Minnesota terminal elevators and processors.

Twin Cities corn receipts in 1985 included 115.4 million bushels with Minnesota origins and 17.6 million bushels from other states. Truck receipts were 95.6 million bushels while rail receipts were 37.5 million bushels. The South Central region shipped the greatest amount of corn to the Twin Cities (51.0 million bushels). The Central region (CRD 5) also was an important source of corn for the Twin Cities (29.3 million bushels.)

Duluth/Superior corn receipts were 2.7 million bushels in 1985. The Southwest region shipped 1.3 million bushels of corn to Duluth/Superior. Virtually all corn received in Duluth/Superior arrived by rail in 1985.

Processors outside the Twin Cities or Duluth/Superior areas are categorized as "Other Minnesota" in the table. Trucks were the dominate carrier for corn movements to these processors.

Although the modal split was 72% truck and 28% rail for terminal elevator receipts from Minnesota, substantial differences existed in the shipment methods between the Crop Reporting Districts. Terminal Elevator

TABLE 5  
CORN  
1985 RECEIPTS AT MINNESOTA TERMINAL ELEVATORS AND PROCESSORS  
FROM UPPER MIDWEST COUNTRY ELEVATORS  
(1,000 bushels)

ORIGIN	DESTINATIONS												TOTAL
	Twin Cities		Duluth/Superior				Other Minnesota						
	RAIL	TRUCK	TOTAL	RAIL	TRUCK	TOTAL	RAIL	TRUCK	TOTAL	TOTAL	% RAIL	% TRUCK	
Minnesota													
Northwest	--	--	--	--	--	--	--	--	--	--	0	--	--
West Central	2,564	1,084	3,648	332	--	332	--	835	835	4,815	60	40	
Central	1,100	28,199	29,300	756	--	756	--	--	--	30,056	6	94	
East Central	649	521	1,170	--	--	--	--	--	--	1,170	55	45	
Southwest	11,295	4,605	15,900	1,279	--	1,279	354	4,064	4,418	21,596	60	40	
South Central	16,030	35,000	51,029	--	--	--	--	380	380	51,409	31	69	
Southeast	348	14,050	14,397	--	--	--	--	--	--	14,397	2	98	
Subtotal	31,985	83,459	115,444	2,367	--	2,367	354	5,279	5,633	123,443	28	72	
Out-of-State													
North Dakota	3,441	4,222	7,663	357	21	378	266	--	266	8,307	49	51	
South Dakota	831	1,084	1,916	--	--	--	--	--	--	1,916	43	57	
Iowa	1,236	6,804	8,040	--	--	--	--	--	--	8,040	15	85	
Subtotal	5,508	12,111	17,619	357	21	378	266	0	266	18,263	34	66	
TOTAL	37,493	95,569	133,063	2,724	21	2,745	619	5,279	5,898	141,705	29	71	

Source: University of Minnesota Grain Flow Survey

receipts from the South Central district were 69% truck movements and 31% rail movements, due to the proximity of Twin Cities and Red Wing/Winona river elevators. The Central district's corn shipments to terminals and processors were primarily by truck (94%). The Southwest district had the highest percentage (60%) by rail for these shipments.

C) Minnesota Terminal Elevator Corn Shipments.

Terminal elevator shipments of corn are shown in Table 6. Barges and lakkers carried 103.5 million bushels in 1985, or 95% of all terminal elevator corn shipments. The remaining 5% of the corn movements were generally by rail from Minnesota terminal elevators, with only negligible truck shipments. Twin Cities terminal elevators shipped the majority of the 109.2 million bushels of total out-of-state shipments in 1985. Barge was the most widely used mode with shipments totaling 100.3 million bushels, most of which was destined for Gulf export terminals. Rail shipments accounted for 5.7 million bushels of corn from Twin Cities elevators, of which 3.7 million bushels was to the Pacific Northwest port area.

Duluth/Superior terminal elevator shipments totaled 3.2 million bushels of corn, all of which were vessel export shipments. Vessel shipments of corn from Duluth/Superior in 1985 were down from 18.7 million bushels in 1984 and 21.9 million in 1983.

D) Country Elevator Corn Shipments Directly to Out-of-State Destinations

Out-of-state shipments from Minnesota subterminals and country elevators located outside the terminal elevator area are listed in Table 7. The majority of these shipments (91%) were by rail. Of the 61.1 million

TABLE 6  
CORN  
1985 MINNESOTA TERMINAL ELEVATOR SHIPMENTS  
(1000 BUSHELS)

ORIGIN	DESTINATIONS					TOTAL
	Gulf	Export	Pacific Northwest	Alabama Tennessee	Other Domestic	
TWIN CITIES						
Rail	0		3,693		1,962	5,655
Truck	0				130	130
Barge	85,324			4,077	9,632	100,254
Sub Total	85,324	0	3,693	4,077	9,632	106,039
DULUTH/SUPERIOR						
Rail	0					0
Truck	0					0
Vessel	0	3,207				3,207
Sub Total	0	3,207	0	0	0	3,207
TOTAL						
Rail	0	0	3,693	0	0	5,655
Truck	0	0	0	0	0	130
Water	85,324	3,207	0	4,077	9,632	103,461
TOTAL	85,324	3,207	3,693	4,077	9,632	109,246

Source: University of Minnesota Grain Flow Survey

TABLE 7  
CORN  
1985 MINNESOTA COUNTRY ELEVATOR SHIPMENTS TO OUT OF STATE DESTINATIONS BY CRD  
(1,000 bushels)

ORIGIN	DESTINATIONS											TOTAL	%RAIL	%TRUCK
	PNW	Mobile,AL	Iowa	Tx.	Wisc.	N&S Dak.	Ind.	Canada	Neb.	Ill.	Cal.			
NORTHWEST	--	--	--	--	--	--	--	--	--	--	--	--	--	--
WEST CENTRAL	23,144	--	--	--	--	1,962	--	823	--	--	--	25,929	91	9
CENTRAL	1,010	--	--	--	--	--	--	--	--	--	--	1,010	100	0
SOUTHWEST	18,950	2,946	20	--	--	480	--	--	1,274	--	767	24,437	93	7
SOUTH CENTRAL	756	--	174	136	1,597	--	716	--	--	5,632	--	9,010	98	2
SOUTHEAST	--	--	365	--	323	--	--	--	--	--	--	688	100	0
TOTAL	43,860	2,946	559	136	1,920	2,442	716	823	1,274	5,632	767	61,073		
% RAIL	100	100	0	100	71	0	100	44	0	100	100	91		
%TRUCK	0	0	100	0	29	100	0	56	100	0	0	9		

Source: University of Minnesota Grain Flow Survey

bushels of corn shipped by these elevators in 1985, 43.9 million bushels (72%) were shipped to the Pacific Northwest. The state of Illinois and the port of Mobile, Alabama were also important export-bound destinations for country elevator corn shipments. The West Central and Southwest regions accounted for the bulk of this directly shipped corn, reflecting the influence of the Pacific Northwest market and their relative distance from river and lake terminals.

#### Minnesota Wheat Movements

##### A) Production

Minnesota produced 142.4 million bushels of wheat in 1985, an 18% increase from 1984. (Table 8). The Northwest region (CRD 1) and the West Central region (CRD 4) together produced 90% of all Minnesota wheat, with production of 83.2 million and 44.6 million bushels, respectively. Wheat in storage in Minnesota increased 78.0 million bushels in 1985. The wheat movements in this study are a total of all wheat, which includes: spring wheat, durum, and winter wheat.

##### B) Minnesota Terminal Elevator and Processor Wheat Receipts.

Wheat receipts by Minnesota terminal elevators and processors were 333.1 million bushels in 1985 (Table 9). The largest share of wheat received by these terminal elevators originated outside Minnesota (252.0 million bushels). North Dakota was the largest out-of-state source for these receipts, shipping 184.9 million bushels in 1985. South Dakota was another important source of wheat for Minnesota terminals and processors, shipping 65.4 million bushels. The Northwest (CRD 1) and the West Central

TABLE 8  
MINNESOTA WHEAT PRODUCTION BY CROP REPORTING DISTRICT  
1982-1985  
(1,000 BUSHELS)

District	1982	1983	% Change From '82	1984	% Change From '83	1985	% Change From '84
Northwest	74,980	47,208	-37%	76,541	62%	83,248	9%
West Central	36,097	23,282	-36%	32,725	41%	44,582	36%
Central	8,191	3,807	-54%	5,281	39%	6,384	21%
East Central	268	285	6%	327	15%	310	-5%
Southwest	3,470	2,498	-28%	2,517	1%	4,674	86%
South Central	2,288	836	-63%	1,469	76%	1,662	13%
Southeast	576	410	-29%	933	128%	757	-19%
TOTALS	126,809	78,960	-38%	120,711	53%	142,426	18%
STOCK CHANGE	10,829	-37,838		26,845		78,006	

Source: Minnesota Agricultural Statistics

TABLE 9  
ALL WHEAT  
1985 RECEIPTS AT MINNESOTA TERMINAL ELEVATORS AND PROCESSORS  
(1000 BUSHELS)

ORIGIN	DESTINATIONS												TOTAL		
	Twin Cities		Duluth/Superior						Other Minnesota						
	RAIL	TRUCK	TOTAL	RAIL	TRUCK	TOTAL	RAIL	TRUCK	TOTAL	RAIL	TRUCK	TOTAL			
Minnesota															
Northwest	10,422	4,974	15,396	24,295	11,580	35,875	426	12	438	51,709	68	32			
West Central	5,887	13,369	19,256	1,728	0	1,728		948	948	21,932	36	64			
Central	0	3,140	3,140	0	121	121			0	3,261	0	100			
East Central	0	0	0	0	0	0			0	0	0	0			
Southwest	0	1,075	1,075	0	0	0			0	1,075	0	100			
South Central	0	582	582	0	0	0		25	25	607	0	100			
Southeast	0	131	131	0	0	0		441	441	572	0	100			
Subtotal	16,309	23,271	39,580	26,023	11,701	37,724	426	1,426	1,852	79,156	54	46			
Out-of-State															
North Dakota	64,715	33,195	97,910	65,189	11,308	76,497	0	10,481	10,481	184,888	70	30			
South Dakota	37,235	18,576	55,811	7,455	0	7,455	0	2,096	2,096	65,362	68	32			
Montana	1,725	0	1,725	0	0	0	0	0	0	1,725	100	0			
Subtotal	103,675	51,771	155,446	72,644	11,308	83,952	0	12,577	12,577	251,975	70	30			
TOTAL	119,984	75,042	195,026	98,667	23,009	121,676	426	14,003	14,429	331,131	66	34			

Source: University of Minnesota Grain Flow Survey

(CRD 4) regions accounted for 92% of all terminal elevator and processor receipts with Minnesota origins.

Wheat receipts by Twin Cities terminal elevators and processors were 195.0 million bushels in 1985, of which 120.0 million arrived by rail and 75.0 million arrived by truck. Nearly 80% of Twin Cities wheat receipts originated outside Minnesota. Wheat receipts from North Dakota were 97.9 million bushels, while 55.8 million bushels were from South Dakota.

Duluth/Superior terminal elevators and processors had wheat receipts of 121.7 million bushels in 1985. The modal breakdown was 98.7 million bushels by rail and 23.0 million bushels by truck. Approximately 70% of Duluth/Superior wheat receipts were from out-of-state, primarily from North Dakota.

Minnesota processors not located in the Twin Cities or Duluth/Superior areas received 14.4 million bushels of wheat in 1985, or about 4% of all wheat receipts in the state. Nearly all of these processor receipts were by truck, with the bulk of receipts originating from North Dakota.

Rail accounted for 68% of wheat shipments from the Northwest district to Minnesota terminals and processors in 1985, while 64% of shipments from the West Central district moved by truck.

#### C) Minnesota Terminal Elevator Wheat Shipments.

Wheat shipments by Minnesota terminal elevators of 226.4 million bushels in 1985 reflect the importance of the Twin Cities and Duluth/Superior in domestic and export wheat movements (Table 10). Twin Cities barge shipments to the Gulf and Duluth/Superior export shipments were 111.3 million bushels of wheat, or 49% of all terminal shipments.

TABLE 10  
ALL WHEAT  
1985 MINNESOTA TERMINAL ELEVATOR SHIPMENTS TO OUT-OF-STATE DESTINATIONS

ORIGIN	DESTINATIONS							TOTAL
	Gulf Ports	Export	Illinois	New York	Penn. Virginia	Other South	Other Midwest	
TWIN CITIES								
Rail	--	--	24,282	5,148	3,798	5,224	9,388	1,331
Truck	--	--	--	--	--	--	--	0
Barge	58,766	--	4,022	--	--	--	17,519	2,332
Sub Total	58,766	--	28,304	5,148	3,798	5,224	26,907	3,663
DULUTH/SUPERIOR								
Rail	--	--	9,839	8,634	824	11	--	1,828
Truck	--	--	--	--	--	--	--	0
Vessel	--	52,574	--	24,503	--	--	--	1,605
Sub Total	--	52,574	9,839	33,137	824	11	--	3,433
TOTAL								
Rail	--	--	34,121	13,782	4,622	5,235	9,388	3,159
Truck	--	--	--	--	--	--	--	0
Water	58,766	52,574	4,022	24,503	--	--	17,519	3,937
TOTAL	58,766	52,574	38,143	38,285	4,622	5,235	26,907	7,096
								231,628

Source: University of Minnesota Grain Flow Survey

Domestic shipments to New York or Illinois were 47.9 million bushels in 1985, comprising 21% of all Minnesota terminal elevator shipments.

Of all shipments from Minnesota terminal elevators, 71% moved by vessel or barge, while the remaining volume moved by rail. Wheat shipments of 196.4 million bushels from the Twin Cities were 82.6 million bushels by barge and 49.2 million bushels by rail, or 63% and 37% of shipments, respectively. Of Duluth/Superior's 99.8 million bushels in wheat shipments, nearly 80% were by vessel.

#### D) Minnesota Country Elevator Wheat Shipments Directly to Out-of-State Destinations

Only the Northwest district (CRD 1) had direct wheat shipments to other states in 1985, as shown in Table 11. Unit train shipments to terminal elevators in the Pacific Northwest accounted for 92% of the nearly 2 million bushels of this 1985 out-of-state wheat movement.

### Minnesota Soybean Movements

#### A) Production

Soybean production in Minnesota decreased to 160 million bushels in 1985 from 172.9 million in 1984, a 7% decline. Table 12 lists the production and storage of soybeans from 1982 to 1985. There was a large 1984 crop and an increase in stocks in 1984 and 1985 which affected the soybean transportation requirements in 1985. The South Central (CRD 8) and the Southwest (CRD 7) districts produced 43.1 million and 40.6 million bushels of soybeans in 1985, respectively, together comprising over half of Minnesota's soybean production. The West Central (CRD 4) and Central (CRD 5) districts also produced substantial amounts of soybeans.

TABLE 11  
ALL WHEAT  
1985 MINNESOTA COUNTRY ELEVATOR SHIPMENTS TO OUT OF STATE DESTINATIONS BY CRD  
(1,000 bushels)

ORIGIN	DESTINATIONS			
	PNW	N. Dak.	TOTAL	% RAIL % TRUCK
NORTHWEST	1,793	161	1,954	100 0
TOTAL	1,793	161	1,954	100 0
% RAIL	100	100	100	
%TRUCK	0	0	0	

Source: University of Minnesota Grain Flow Survey

TABLE 12  
MINNESOTA SOYBEAN PRODUCTION BY CROP REPORTING DISTRICT  
1982-1985  
(1,000 BUSHELS)

District	1982	1983	% Change From 1982	1984	% Change From 1983	1985	% Change From 1984
Northwest	3,195	5,956	86%	7,656	29%	4,966	-35%
West Central	29,927	26,981	-10%	33,477	24%	30,669	-8%
Central	29,026	23,676	-18%	27,913	18%	26,016	-7%
East Central	2,304	2,201	-4%	2,339	6%	2,294	-2%
Southwest	45,324	35,835	-21%	40,755	14%	40,632	0%
South Central	47,010	39,964	-15%	45,850	15%	43,105	-6%
Southeast	14,650	12,572	-14%	14,911	19%	12,309	-17%
TOTALS	171,465	147,200	-14%	172,920	17%	160,000	-7%
STOCK CHANGE	42,133	-30,637	-173%	20,120	166%	42,014	109%

Source: University of Minnesota Grain Flow Survey

B) Minnesota Terminal Elevator and Processor Soybean Receipts.

There were two major Minnesota destinations for soybeans in 1985 (Table 13). Twin Cities terminal elevator and processors received 63.2 million bushels of soybeans in 1985, drawing substantial amounts of soybeans from the Central, West Central, and Southwest districts of Minnesota. The Twin Cities also received smaller quantities of soybeans from North and South Dakota. Soybean processors outside the terminal elevator areas provided an important market for producers in the South Central, Southwest, and West Central districts, receiving total shipments of 49.7 million bushels of soybeans from these districts in 1985.

The Twin Cities and outstate processors destinations show little difference in modal breakdown for soybean receipts. Trucks carried 77% of all soybeans destined for these Minnesota locations, which was virtually unchanged from 1983. Receipts from Minnesota origins had truck movements of 81%. Minnesota soybean receipts with out of state origins had rail movements of 55%.

The Southwest district shipped the largest volume of soybeans out of the district in 1985, of which 73% moved by truck. The bulk of the South Central district's Minnesota soybean shipments were by truck to outstate processors. Terminal elevator soybean receipts originating from the Central district were all by truck, with 86% of this movement destined for the Twin Cities. The West Central district's movements included shipments to the Twin Cities by rail (70%), and shipments destined for processors, primarily by truck.

TABLE 13  
SOYBEANS  
1985 RECEIPTS AT MINNESOTA TERMINAL ELEVATORS AND PROCESSORS  
FROM UPPER MIDWEST COUNTRY ELEVATORS  
(1,000 bushels)

ORIGIN	DESTINATIONS										TOTAL	
	Twin Cities		Duluth/Superior		Other Minnesota		TOTAL		TOTAL			
Minnesota	RAIL	TRUCK	TOTAL	RAIL	TRUCK	TOTAL	RAIL	TRUCK	TOTAL	TOTAL	% RAIL	% TRUCK
Northwest	1,303	1,824	3,127	--	--	--	317	386	703	3,830	42	58
West Central	7,121	3,142	10,263	--	--	--	1,007	10,311	11,318	21,581	38	62
Central	--	19,294	19,294	--	--	--	--	3,179	3,179	22,473	0	100
East Central	--	--	--	--	--	--	--	--	--	--	--	--
Southwest	3,902	6,217	10,119	--	--	--	2,980	12,454	15,434	25,553	27	73
South Central	666	5,947	6,613	--	--	--	3,245	14,495	17,740	24,353	16	84
Southeast	--	4,253	4,253	--	--	--	--	368	368	4,621	0	100
Subtotal	12,992	40,677	53,669	--	--	--	7,549	41,193	48,742	102,411	19	81
Out-of-State												
North Dakota	4,290	2,792	7,082	--	--	--	--	327	327	7,409	58	42
South Dakota	1,470	957	2,427	--	--	--	--	627	627	3,054	48	52
Subtotal	5,760	3,749	9,509	0	0	0	0	954	954	10,463	55	45
TOTAL	18,752	44,426	63,178	0	0	0	7,549	42,147	49,696	112,874	23	77

Source: University of Minnesota Grain Flow Survey

C) Minnesota Terminal Elevator Soybean Shipments.

Soybean shipments from the Twin Cities of 49.3 million bushels were considerably lower than the 82.5 million bushels recorded in 1984 and 116.6 million bushels during 1983 (Table 14). All terminal elevator soybean shipments were by barge, with 93% of this shipments bound for Gulf ports. There were some soybean shipments to soybean processors, primarily in the southern states, which accounted for the remaining barge movement.

D) Minnesota Country Elevator Shipments Directly to Out-of-State Destinations.

Direct shipments of 14.1 million bushels in 1985 (Table 15) indicated there were three major direct out-of-state shipment destinations for Minnesota country elevators. The Pacific Northwest received 41% of these shipments, (5.8 million bushels) by unit train. The Gulf port of Mobile, Alabama received 2.8 million bushels by unit train, accounting for 20% of all direct shipment shipments. Midwest soybean processors and river terminals in other states were the third destination for subterminal and country elevator shipments. Iowa shipments were the largest in this destination group, receiving 4.2 million bushels of soybeans, of which 82% were by truck.

TABLE 14  
SOYBEANS  
1985 MINNESOTA TERMINAL ELEVATOR SHIPMENTS TO OUT-OF-STATE DESTINATIONS  
(1000 bushels)

ORIGIN	DESTINATIONS					TOTAL
	Gulf Ports	Alabama	Miss.	Tennessee	Illinois	
TWIN CITIES						
Rail	--	--	--	--	--	0
Truck	--	--	--	--	--	0
Barge	45,635	1,277	150	1,526	706	49,294
Sub Total	45,635	1,277	150	1,526	706	49,294
DULUTH/SUPERIOR						
Rail	--	--	--	--	--	--
Truck	--	--	--	--	--	--
Vessel	--	--	--	--	--	--
Sub Total	--	--	--	--	--	--
TOTAL						
Rail	--	--	--	--	--	--
Truck	--	--	--	--	--	--
Water	45,635	1,277	150	1,526	706	49,294
TOTAL	45,635	1,277	150	1,526	706	49,294

Source: University of Minnesota Grain Flow Survey

**TABLE 15**  
**SOYBEANS**  
**1985 MINNESOTA COUNTRY ELEVATOR SHIPMENTS TO OUT OF STATE DESTINATIONS BY CRO**  
**(1000 bushels)**

ORIGIN	DESTINATIONS							TOTAL	% RAIL	% TRUCK
	PNW	Gulf	Iowa	Mo.	Misc.	S. Dak	Nebr.			
NORTHWEST		703						703	100	0
WEST CENTRAL	5,335	724	20					6,079	100	0
CENTRAL	425							425	100	0
SOUTHWEST		1,393	2,859	192		26	954	5,424	47	53
SOUTH CENTRAL			894					894	90	10
SOUTHEAST			395		164			559	100	0
TOTAL	5,760	2,117	4,168	192	164	26	954	14,084		
% RAIL	100	100	98	100			100	98		
% TRUCK			2		100	100		2		

Source: University of Minnesota Grain Flow Survey

## LIST OF SOURCES

- Economic Research Service, USDA. Foreign Agricultural Trade of the United States (FATUS). (various years)
- Farmer's Elevator Association of Minnesota. 1977-1987. Yearbook. Minneapolis.
- Agricultural Marketing Service, USDA. Grain and Feed News. (various years)
- Guthrie-Hubner, Inc. 1980-1986. Port of Duluth/Superior Shipments.
- Halbach, Daniel. 1985. An Economic Analysis of Minnesota Grain Flows: 1983. Master's Thesis, University of Minnesota.
- Interstate Commerce Commission. Railroad Waybill Statistics, 1985.
- Minneapolis Grain Exchange. Minneapolis Grain Exchange Statistical Annual. (various years)
- Minnesota Department of Agriculture. Minnesota Agricultural Statistics. (various years)
- Upper Great Plains Transportation Institute. North Dakota Grain and Oilseed Transportation Statistics (various years), North Dakota State University, UGPTI 36.
- U.S. Department of the Army, Corps of Engineers. Waterborne Commerce of the United States, 1985.