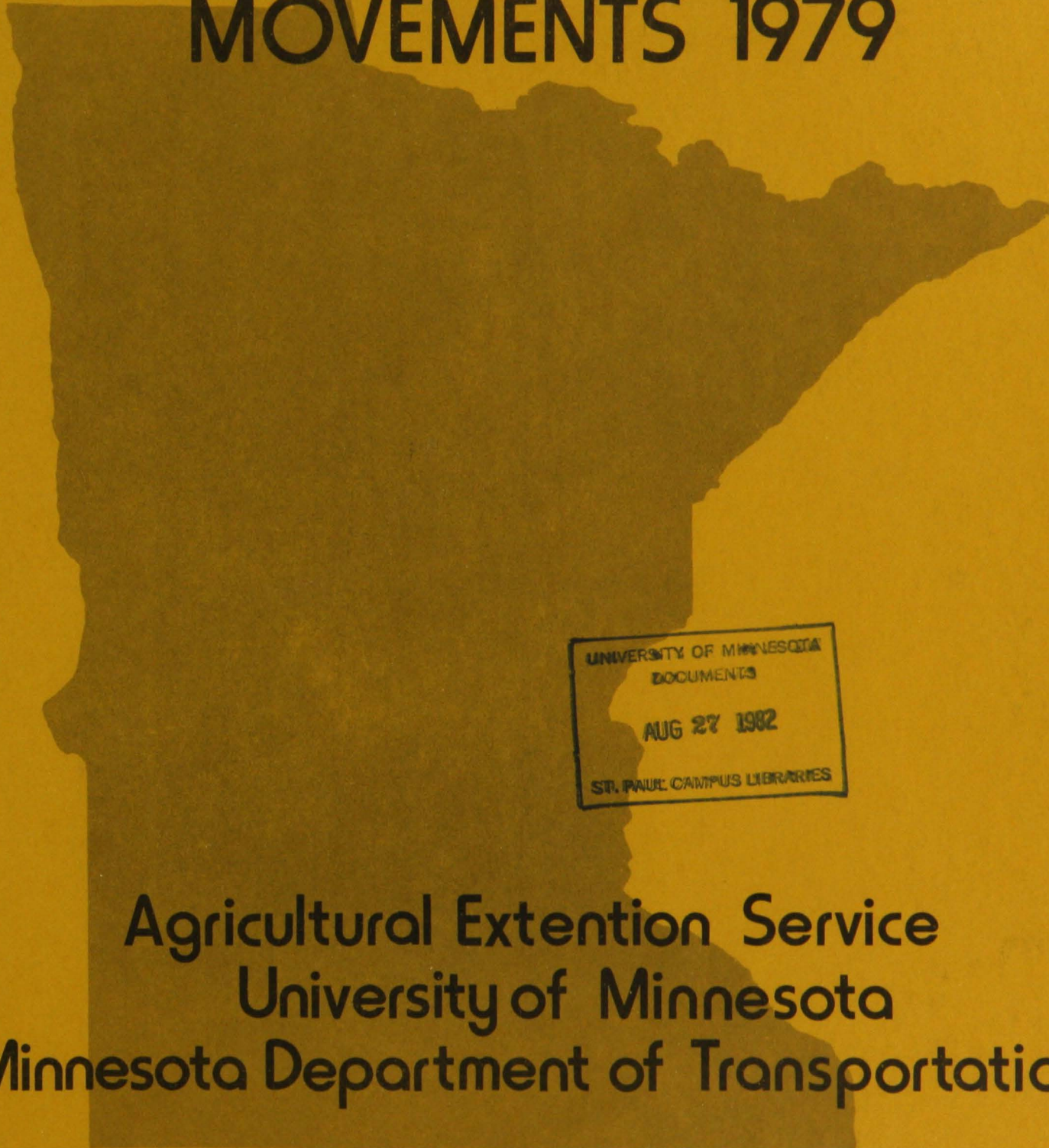


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# MINNESOTA BARLEY, OATS, SUNFLOWER, FLAX, AND RYE MOVEMENTS 1979



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MINNESOTA BARLEY, OATS, SUNFLOWER,  
FLAX, AND RYE MOVEMENTS

1979

Extension Bulletin 471-1982

by

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## INTRODUCTION

Minnesota cash grain producing areas, located far from the population centers of the eastern and western seaboard and from deepwater ocean ports, depend on an efficient transportation system to be competitive in domestic and world markets. A flexible system is also important due to the volatility of world grain markets.

Today, the Upper Midwest marketing and transportation system is undergoing major changes. Historically, nearly all Minnesota cash grain moving into export markets moved either into the Twin Cities for transshipment via barge to the Gulf of Mexico, or to Duluth/Superior for transshipment via vessel through the Great Lakes. Cash grain not exported, or processed in-state, moved via rail to processors in the East. Although water modes of transportation continue to be the predominant export link, and rail the predominant link to the East, alternative routes and markets have developed adding flexibility to the Upper Midwest marketing and transportation system. Major changes include the emergence of the Pacific Northwest as a major corn export port, the expansion of country subterminal elevators, and the development of unit-trains with their lower rates.

The growth of the Pacific Northwest as an export market is in response to the growing demand for corn from countries bordering the Pacific Ocean. Major Pacific Rim customers include Japan, Taiwan, China, and Korea. Historically, corn exported to these countries moved from ports on the Gulf of Mexico through the Panama Canal and across the Pacific. Higher ocean fuel costs, bottlenecks at the Panama Canal, and the Mississippi River bottleneck at Lock and Dam 26 have worked in favor of ports in the Pacific Northwest.

Lower unit-train rates have reduced the transport costs from country subterminals and have increased marketing alternatives for country elevators.

As a result, more and more grain is being shipped directly between country subterminals and deepwater ports at the Gulf of Mexico and in the Pacific Northwest.

The investment in unit-train loading facilities has been dramatic. In 1974, there were 19 country subterminal elevators in Minnesota which could load 25 cars or more. In 1980, there were 55. Most of these facilities are located in southern Minnesota where corn density is greatest.

Changes are also occurring in the "gathering movements" to Duluth/Superior and the Twin Cities. Most notable is the increased utilization of trucks. This trend is particularly apparent in movements to the Twin Cities. Trucks share of the total grain volume received in the Twin Cities increased from 47 percent in 1970 to 73 percent in 1979. Similarly, trucks accounted for only 25 percent of the grain received in Duluth/Superior, but 49 percent of the much larger volume in 1979.

The passage of the "Staggers Rail Act of 1980" and increases in waterway user fees will also influence the marketing of Minnesota cash grain. Major provisions of the Staggers Act involve abandonment and rate-making policy. The Act encourages railroad companies to abandon unprofitable lines. Minnesota, which has many light-density lines, may lose additional lines.

The rate-making provisions include significant deregulation which allows railroad companies more freedom in raising and lowering rates. Furthermore, railroads can now enter into rate and service contracts with shippers. This ability to enter into contracts could place smaller shippers at a disadvantage to larger shippers who have more bargaining power with the railroads.

Several waterway user fee proposals may add as much as 20 cents per bushel to freight costs. Most of the added cost would be transferred back to producers in the form of lower prices.

More extensive discussions of agricultural transportation problems facing Minnesota are available in the following Extension folders: Upper Midwest Transportation Issues for the 1980's, Extension Folder 556-1980, Jerry Fruin; Yesterday, Today, and Tomorrow: Railroads in Minnesota, Extension Folder 624-1981, Jerry Fruin and Robert Lunt; The Railroad Problem in Minnesota, Extension Folder 515-Revised 1980, Jerry Fruin and Mike Alley; and Minnesota Grain Movements in the Seventies: Changing Trends, Extension Bulletin 472-1982, J. Mike Alley, Jerry Fruin and Chuck Eldridge.

## THE SURVEY

Although reliable estimates of grain production in Minnesota exist, there has not been accurate information available about the movement of grain after it leaves the farm. Information of this type is needed by grain producers, shippers, transportation firms, and merchandizers to identify additional marketing opportunities and to make better marketing decisions. This information is also necessary for the formulation of rational grain transportation policies, given the uncertainties of regulatory reform and waterway user fees, railroad bankruptcies and abandonments, and road and highway financing problems.

Consequently, a survey was conducted at the request of the Minnesota Department of Agriculture and the Minnesota Department of Transportation to provide basic data relative to Minnesota grain movements. The survey was designed to estimate the quantity of grain shipped and received, the origin and destination of the shipments, the mode of transportation and the month of shipment for the 1979 calendar year.

One hundred ninety-eight country elevators, 39 terminal elevators, and 36 grain processors were surveyed. Country elevators included feed mills and train-loading facilities that were not in the Twin Cities, Red Wing, Winona, and Duluth/Superior. Terminal elevators included the lake terminals in Duluth/Superior, terminal elevators on the Mississippi and Minnesota Rivers capable of loading barges, and other large terminal elevators located in the Twin Cities rail-switching district. Grain processors included all Minnesota processors of wheat, soybeans, barley, sunflowers, oats, flax, and rye.

Each year there are unforeseen developments which influence marketing patterns. Calendar year 1979 was no exception. Larger than average harvests in 1978 and 1979, a rail car shortage, and a Grain Millers strike in Duluth/Superior all influenced the flow of grain in 1979. The rail car shortage



was aggravated by the bankruptcies of the Rock Island and Milwaukee Railroads. The Grain Millers strike, which began on July 6, virtually halted all grain shipments from Duluth/Superior harbors for the next 82 days.

This folder examines the movement of barley, oats, sunflowers, flax and rye produced or marketed in Minnesota. Three companion bulletins examine the movements of wheat, corn and soybeans: Minnesota Wheat Movements, 1979, Extension Bulletin 467-1982, J. Mike Alley, Jerry Fruin and Chuck Eldridge; Minnesota Corn Movements, 1979, Extension Bulletin 466-1982, J. Mike Alley, Jerry Fruin and Chuck Eldridge; Minnesota Soybean Movements, 1979, Extension Bulletin 468-1982, J. Mike Alley, Jerry Fruin and Chuck Eldridge.

## BARLEY

Minnesota is among the leading barley producing states. In 1979, Minnesota ranked fourth behind North Dakota, Idaho and California. The majority of barley produced in Minnesota and surrounding states, that is not fed locally, moves into Minnesota either to maltsters or terminal elevators in the Twin Cities and Duluth/Superior. Barley shipped to the Twin Cities is either malted or transshipped via rail to maltsters east of the Mississippi River. In 1979, roughly 27 million bushels of barley were malted in Minnesota. Barley shipped to Duluth/Superior is either exported via the Great Lakes or shipped by rail to maltsters in the east.

### Barley Movements Into and Within Minnesota

Figure 1 shows the volume of barley shipped into or within Minnesota by country elevators in the Upper Midwest in 1979. North Dakota accounted for 49 of the 57 million bushels moving into the state. Minnesota country elevators shipped 32 million bushels to in-state destinations. Railroads were the predominant mode of transportation, accounting for 85 percent of the shipments from out-of-state origins and 59 percent of the shipments from Minnesota origins.

The Twin Cities was the predominant destination, receiving 56 million bushels (primarily malting varieties). Figure 2 shows the origin of the movements to the Twin Cities<sup>1</sup> and the relative shares carried by trucks and railroads. North Dakota accounted for 34 of the 56 million bushels received. The Northwest Crop Reporting District (CRD) and the West Central CRD accounted

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<sup>1</sup> Includes maltsters in Moorhead, Cannon Falls, Red Wing, and Winona.

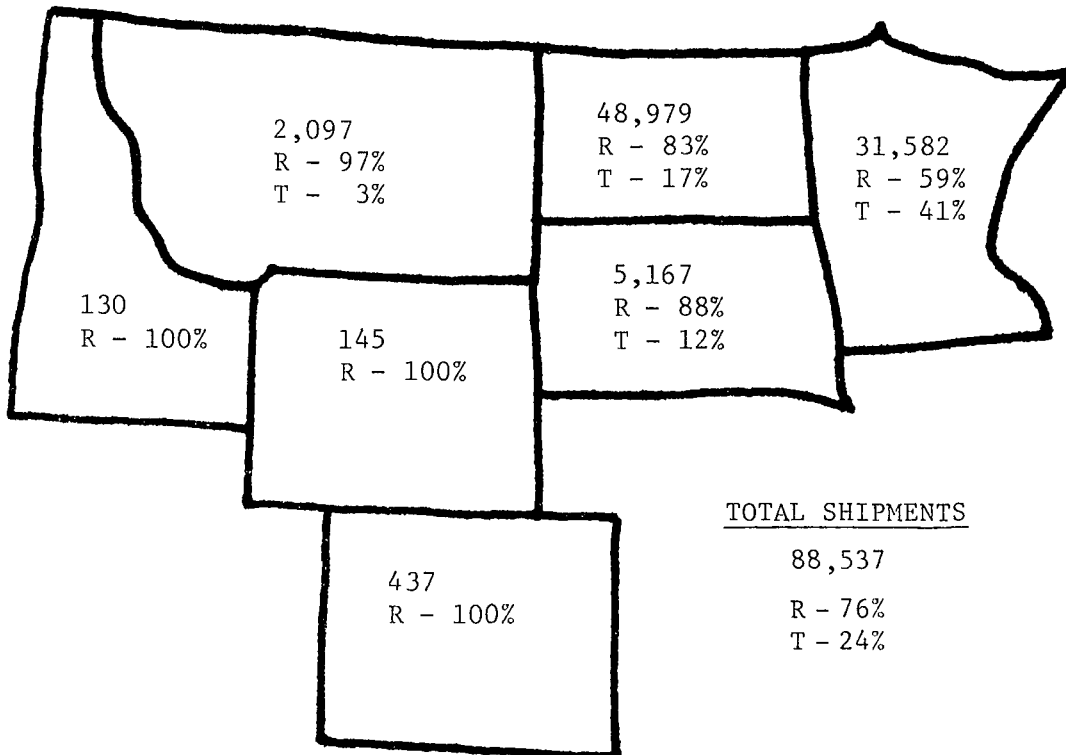
for nearly all the shipments from Minnesota. Railroads, which are often preferred to trucks because of transit privileges, accounted for 90 percent of the shipments.

Lake terminal elevators in Duluth/Superior received 31 million bushels (primarily feed barley) in 1979. Figure 3 shows the origins of the barley shipped to Duluth/Superior and the relative shares carried by trucks and railroads. North Dakota shippers accounted for roughly half of volume received. The Northwest CRD accounted for nearly all shipments originating in Minnesota. Truck was the predominant mode for shipments by Minnesota country elevators, whereas rail was the predominant mode for shipments by out-of-state country elevators.

FIGURE 1

UPPER MIDWEST COUNTRY ELEVATOR BARLEY SHIPMENTS TO MINNESOTA DESTINATIONS, 1979

(1,000 bushels)



### Barley Movements Out of Minnesota

Terminal elevators in the Twin Cities and Duluth/Superior shipped an estimated 44 million bushels of barley to out-of-state destinations in 1979. Railroads accounted for 58 percent of these shipments. Forty percent moved by barge or vessel. Figure 4 shows the destination of the shipments and volume carried by each mode of transportation.

Lake terminal elevators in Duluth/Superior shipped 25 million bushels. Thirteen million bushels were exported to the USSR (4 million), Syria (2.2 million), Iraq (1.9 million), East Germany, West Germany, Malta, Italy and Iran. Nearly 8 million bushels were shipped by rail to Wisconsin, New York, Texas and Illinois.

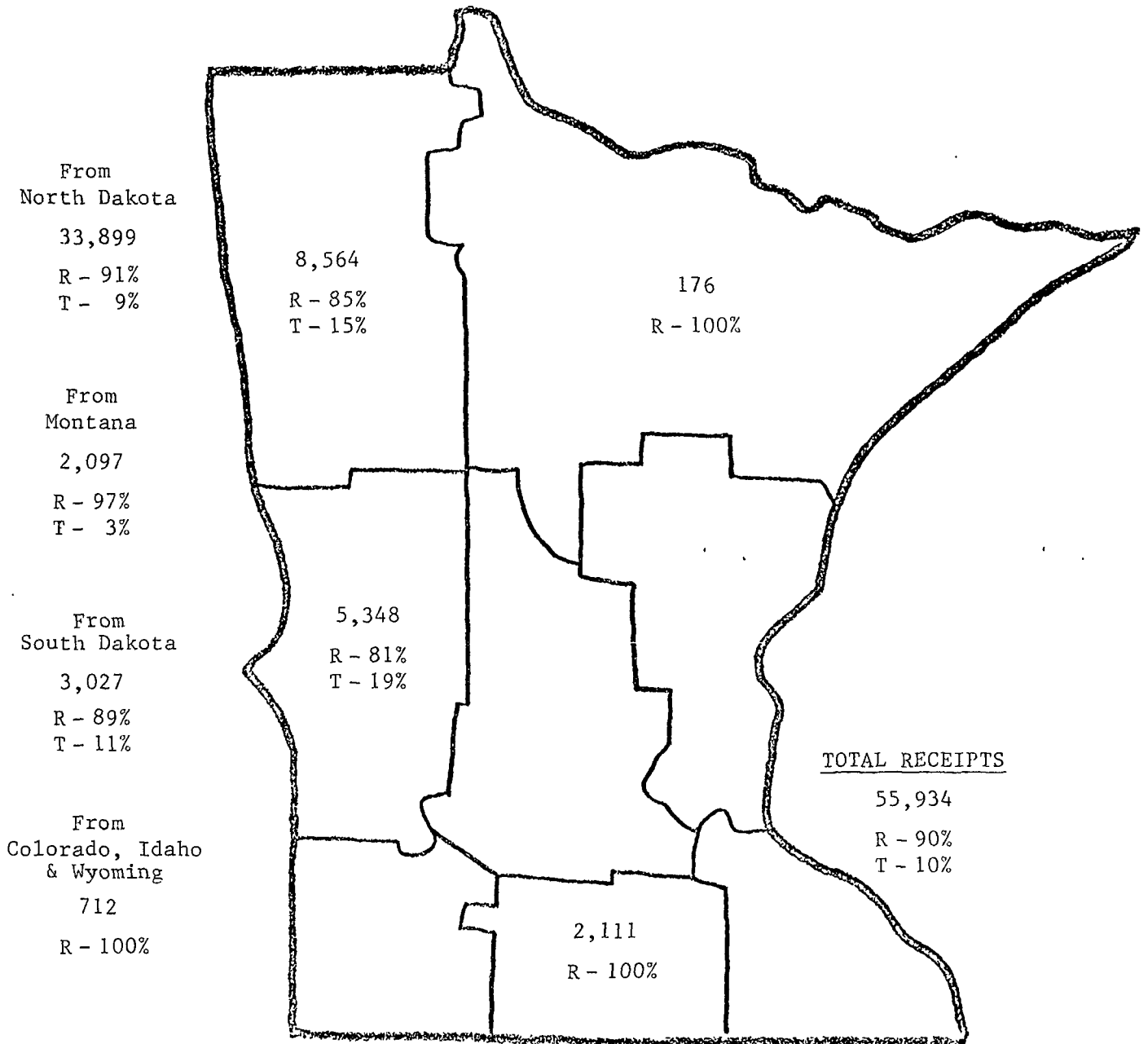
Terminal elevators and malting houses in the Twin Cities shipped an estimated 18.3 million bushels out-of-state. Over half of the shipments were to maltsters in Wisconsin. Rail accounted for 96 percent of the shipments. Maltsters in New York, Illinois, Pennsylvania and Ohio received roughly one million bushels each.

Roughly 5.5 million bushels were shipped directly out-of-state by Minnesota country elevators. The Northwest CRD (2.2 million) and the South Central CRD (2.9 million) accounted for the majority of these shipments. Almost all of the shipments were by rail to maltsters in Wisconsin and states further east.

FIGURE 2

UPPER MIDWEST COUNTRY ELEVATOR BARLEY  
SHIPMENTS TO THE TWIN CITIES\*, 1979

(thousand bushels)



\*Includes maltsters in Moorhead, Cannon Falls, Red Wing and Winona.

FIGURE 3

UPPER MIDWEST COUNTRY ELEVATOR BARLEY  
SHIPMENTS TO DULUTH/SUPERIOR, 1979  
(thousand bushels)

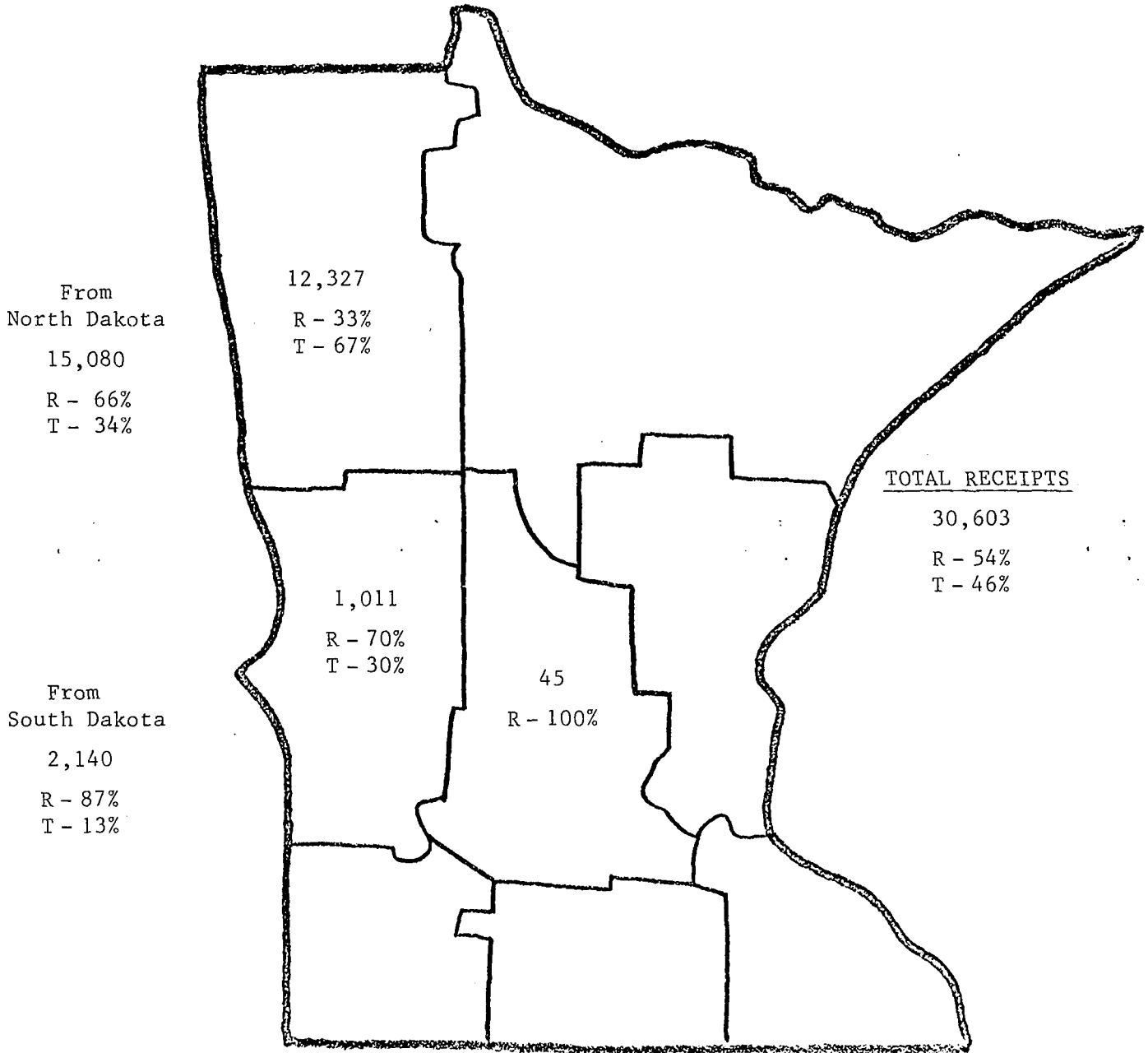
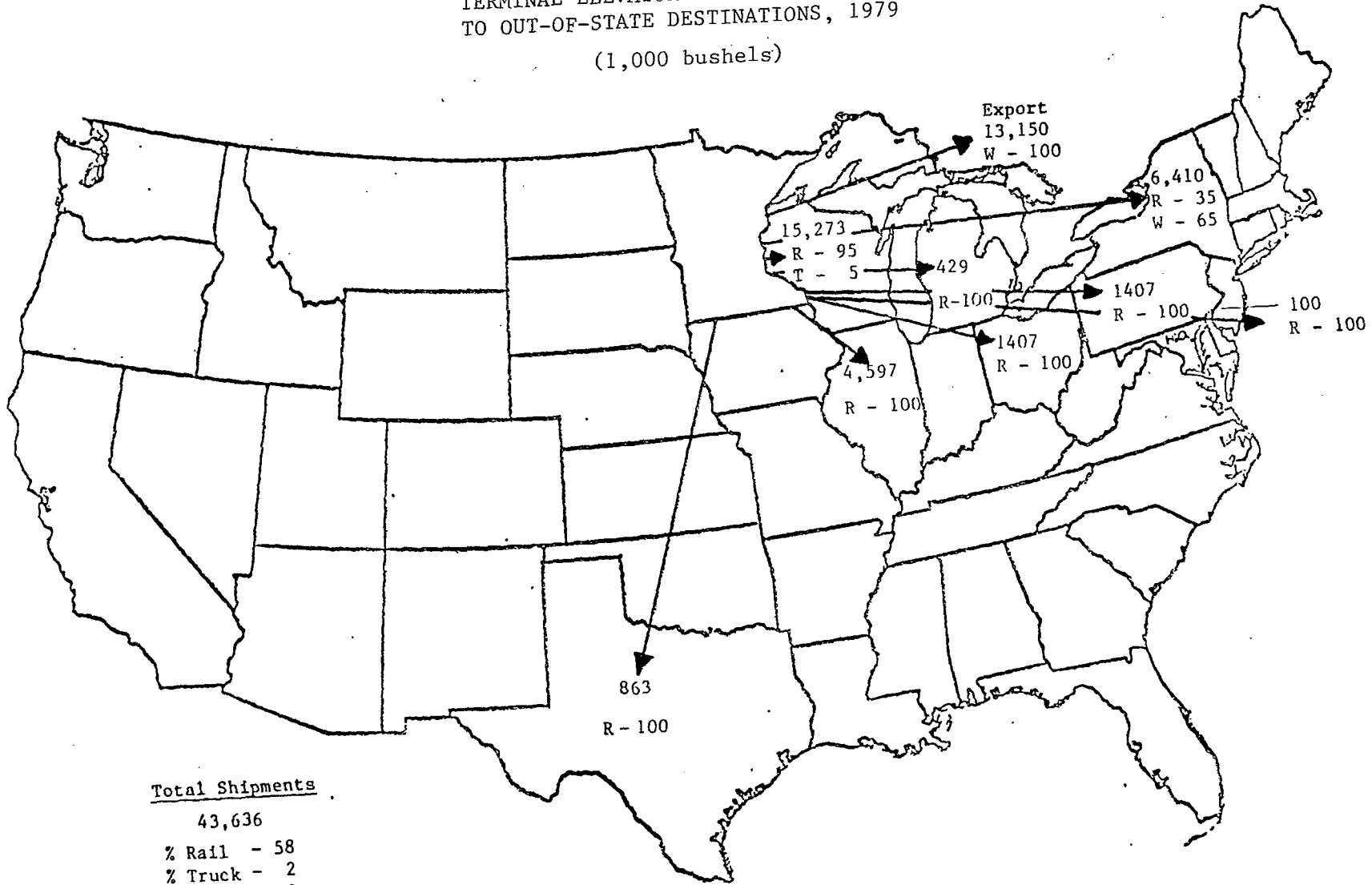


FIGURE 4  
 TERMINAL ELEVATOR BARLEY SHIPMENTS  
 TO OUT-OF-STATE DESTINATIONS, 1979  
 (1,000 bushels)



## OATS

Minnesota was second in the production of oats in 1979 to South Dakota. The primary use of oats in Minnesota and the Dakotas is for livestock feed. The volume of oats fed locally varies from year to year in response to changes in its relative price to other feed grains. In 1979, 66 percent of the oats produced in Minnesota and the Dakotas was used on the farm where produced. Most of the oats not fed locally are shipped to the Twin Cities and Duluth/Superior either for processing or transshipment. Very few oats were exported in 1979.

### Oat Movements Into and Within Minnesota

The Twin Cities received 25.3 million bushels of oats in 1979. Roughly 14.7 million bushels originated in the Dakotas (Figure 5). Rail was the predominant mode of destination, accounting for 69 percent of the oats received. Rail is often preferred to truck due to the favorable proportional rates available to the major oat consuming regions.

Minnesota country elevators shipped 10.6 million bushels to the Twin Cities. The West Central CRD (4.4 million), Northwest CRD (2.4 million) and the Southwest CRD (2.1 million) accounted for most of the shipments. Rails accounted for 64 percent of the shipments.

An estimated 1.9 million bushels were shipped to Duluth/Superior. Trucks accounted for 62 percent of the shipments. Roughly half of the oats received originated in the Dakotas. The Northwest CRD accounted for nearly all the shipments originating in Minnesota.



Oat Movements Out of Minnesota

Terminal elevators in the Twin Cities shipped an estimated 15.6 million bushels of oats to out-of-state destinations in 1979. Figure 6 shows the destination of the shipments. Water modes of transportation, primarily barge, accounted for half the shipments. Railroads accounted for 42 percent of the shipments. States bordering the Gulf of Mexico were the predominant destinations, receiving 6 million bushels. Included in Figure 6 are the 1.3 million bushels exported directly from Duluth/Superior via vessel to Canada and Venezuela.

Roughly 6.7 million bushels were shipped directly out-of-state by Minnesota country elevators. Trucks accounted for 79 percent of these shipments. The Northwest CRD (2.6 million) and Southwest CRD (2.2 million) accounted for most of the shipments. The majority of the shipments were to Iowa and states east of the Mississippi River.

FIGURE 5

UPPER MIDWEST COUNTRY ELEVATOR OAT  
SHIPMENTS TO THE TWIN CITIES, 1979  
(thousand bushels)

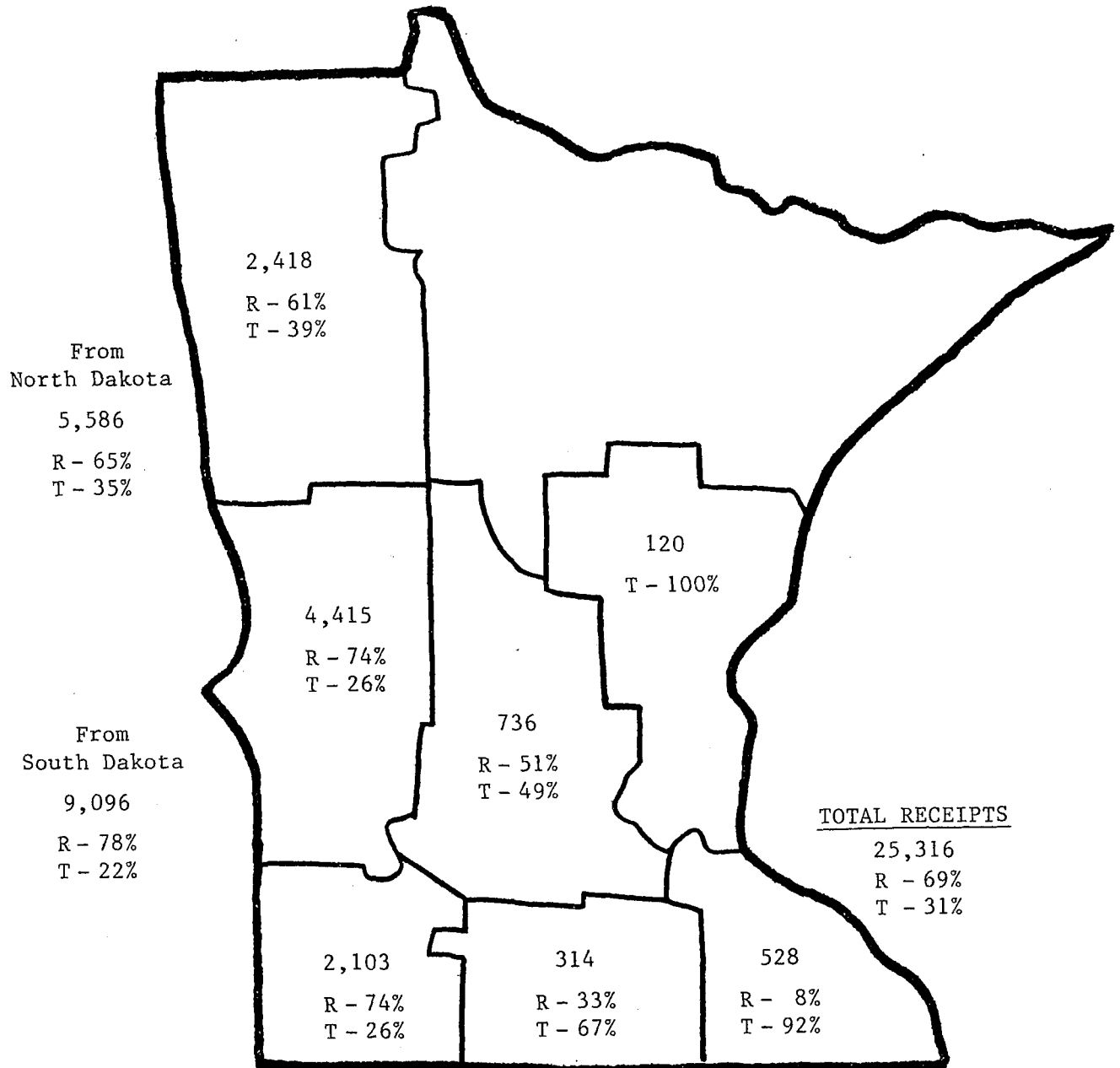
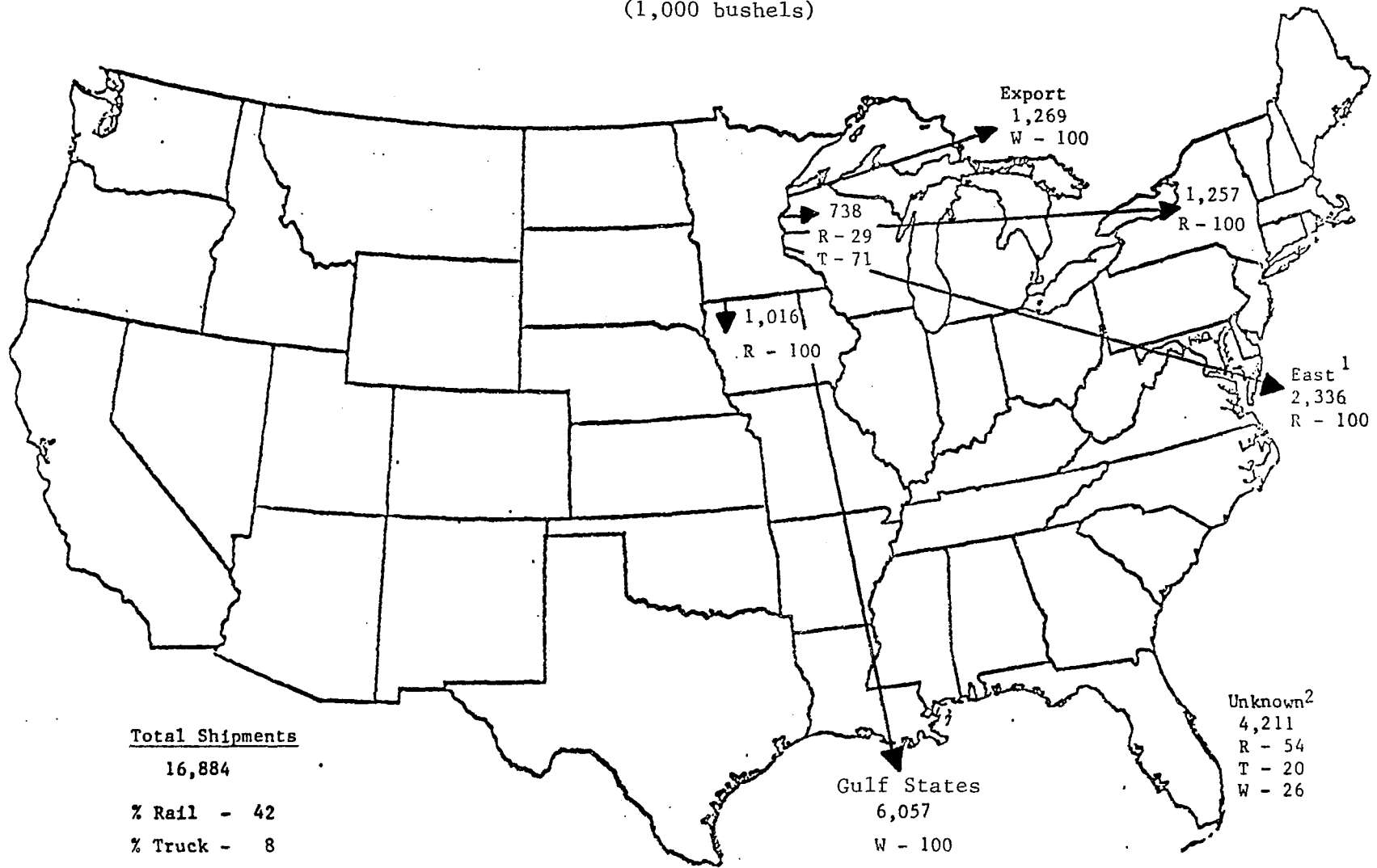


FIGURE 6  
 TERMINAL ELEVATOR OAT SHIPMENTS  
 TO OUT-OF-STATE DESTINATIONS, 1979  
 (1,000 bushels)



<sup>1</sup> Shipments to locations east of the Mississippi River.  
<sup>2</sup> Shipments to unknown locations outside Minnesota.

## SUNFLOWERS

Sunflowers emerged as a major cash grain in Minnesota and the Dakotas in the latter half of the 1970's. Table 1 shows the rapid growth in production in the tri-state region between 1975 and 1981. In 1979, sunflower production in the tri-state region peaked at 6.9 billion pounds, representing 99 percent of the sunflower production in the country.

Although a growing share of sunflowers is being processed in the Upper Midwest, the majority is shipped to Duluth/Superior for transshipment via vessel to oilseed crushers in Western Europe. This trend is expected to continue as the demand for sunflower oil remains high in Western Europe. Sunflowers cargoes, which are light in weight, do not present a significant draft problem going through the Seaway. Sunflowers will continue to be a bright spot for Duluth/Superior compared with other grain cargoes which are hampered by draft and lock limitations.

TABLE 1

SUNFLOWER PRODUCTION IN MINNESOTA,  
NORTH DAKOTA AND SOUTH DAKOTA (1975-81)

(1,000 pounds)

<u>Year</u>	<u>Minnesota</u>	<u>North Dakota</u>	<u>South Dakota</u>	<u>Total</u>
1975	200,100	383,900	116,775	700,775
1976	223,200	420,000	--	543,200
1977	713,910	1,466,850	125,760	2,036,520
1978	985,600	2,319,540	178,080	3,483,220
1979	1,793,100	4,379,200	752,760	6,925,060
1980	993,650	2,009,000	459,080	3,461,730
1981	738,270	2,880,000	470,800	4,089,070

Source: U.S. Department of Agriculture.

### Sunflower Movements Into and Within Minnesota

A total of 35 million hundredweight of sunflowers were shipped to Duluth/Superior, the Twin Cities, and Red Wing by country elevators in Minnesota and the Dakotas in 1979. North Dakota accounted for 59 percent (20.6 million hundredweight) of these movements. Truck was the predominant mode of transportation, accounting for 81 percent of the shipments.

Duluth/Superior was the predominant destination, receiving 27.9 million hundredweight. Figure 7 shows the origin of the movements into Duluth/Superior. North Dakota originated 16.6 million hundredweight. Country elevators in the Northwest CRD and the West Central CRD accounted for almost all the sunflowers originating in Minnesota. Roughly 79 percent of the sunflowers received moved by truck.

Processors and terminal elevators in the Twin Cities and Red Wing received 7.6 million hundredweight (Figure 8). North Dakota country elevators accounted for 4 million hundredweight shipped to these destinations. Truck was the predominant mode of transportation, accounting for 89 percent of the shipments.

### Sunflower Movements Out of Minnesota

An estimated 26.7 million hundredweight were exported from Duluth/Superior in 1979. All of the shipments were by vessel. Figure 9 shows the destination regions of the shipments. Western Europe was the predominant destination, receiving 84 percent of the shipments. Holland, West Germany and Portugal were the major buyers. Roughly one million hundredweight were barged to the Gulf of Mexico for export.

FIGURE 7

UPPER MIDWEST COUNTRY ELEVATOR SUNFLOWER  
SHIPMENTS TO DULUTH/SUPERIOR, 1979

(thousand hundredweight)

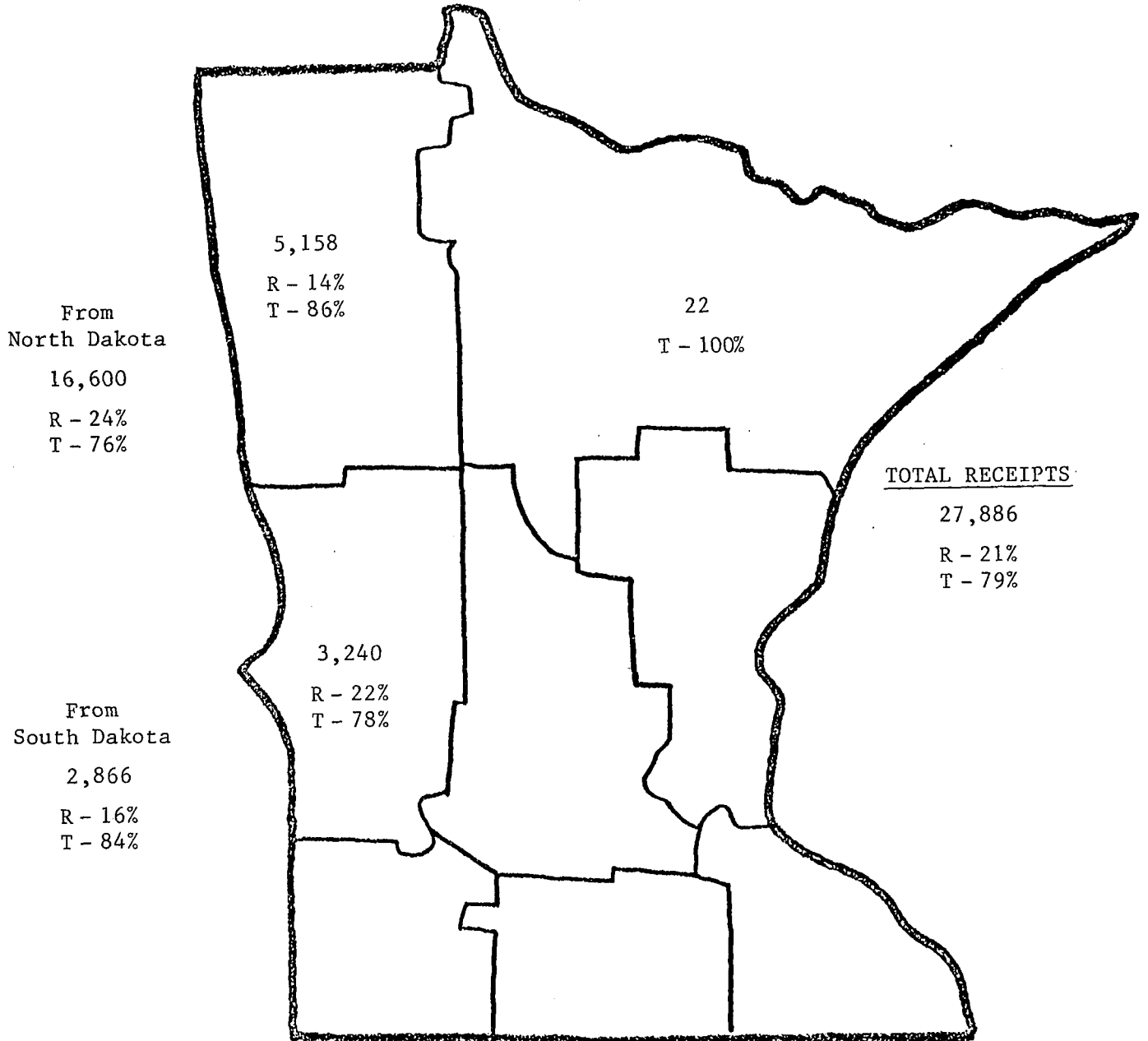
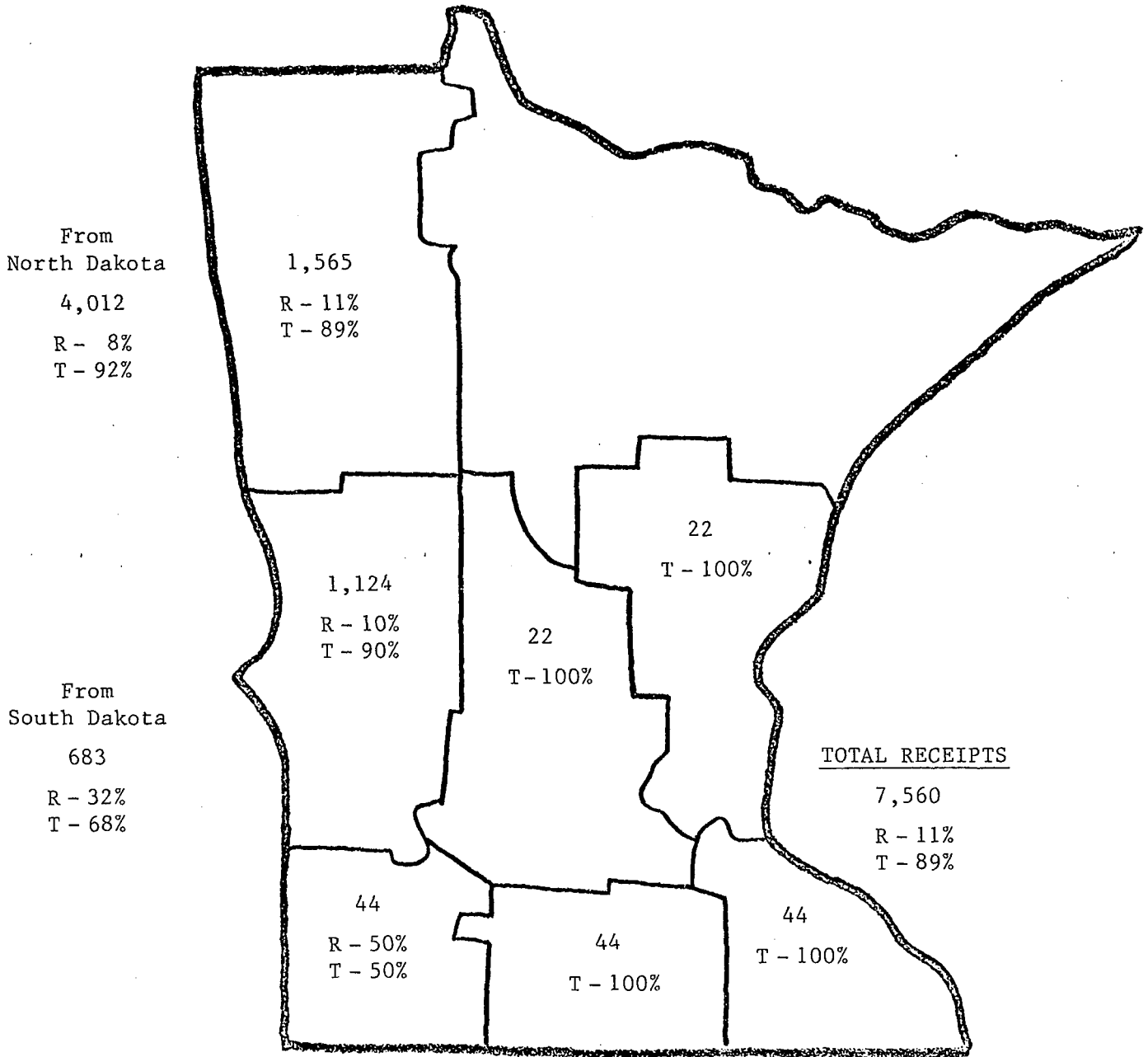


FIGURE 8  
UPPER MIDWEST COUNTRY ELEVATOR SUNFLOWER  
SHIPMENTS TO THE TWIN CITIES\*, 1979  
(thousand hundredweight)

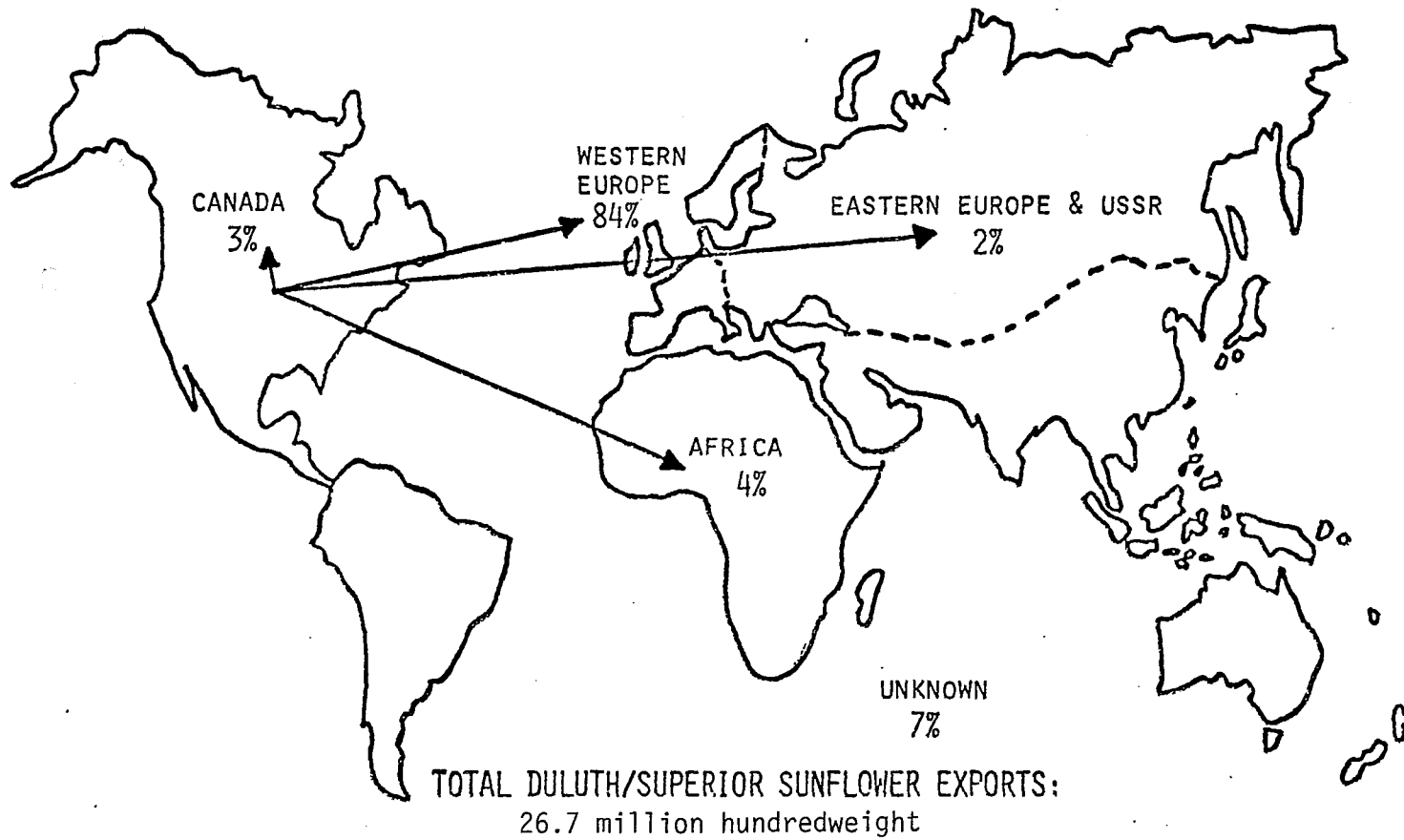


\*Includes Red Wing.

FIGURE 9

SUNFLOWERS

1979 EXPORTS FROM DULUTH/SUPERIOR PORTS



SOURCE: USDA, INSPECTION FOR EXPORTS BY COASTAL AREAS AND COUNTRY OF DESTINATION.



## FLAX

The importance of flax as a cash crop in the Upper Midwest has declined over the years as synthetic paints have replaced oil-based paints in popularity. Although Minnesota produced only 2.2 million bushels in 1979, the state still ranked third in the country behind the two Dakotas. Almost all of the flax produced in Minnesota is grown in the western half of the state, primarily in the Red River Valley.

Processors in the Twin Cities and Red Wing have been the primary market outlets. U.S. flax exports, with the exception of 1970 and 1972, have been negligible.

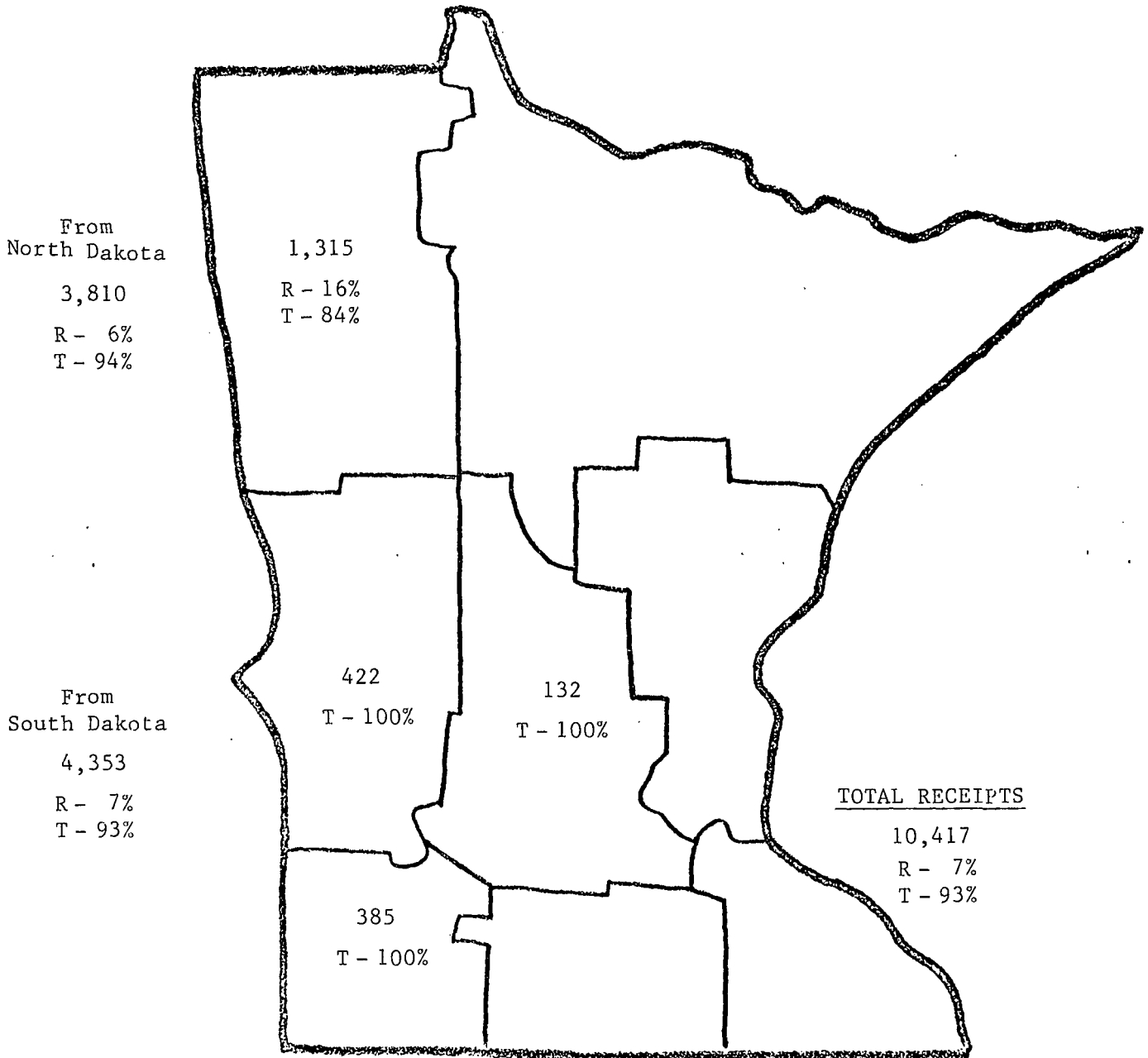
### Flax Movements Into the Twin Cities and Red Wing

An estimated 10.4 million bushels of flax were received in the Twin Cities (including Red Wing) in 1979 (Figure 10). South Dakota accounted for 4.4 million bushels. The Northwest CRD accounted for over half of the 2.25 million bushels shipped by Minnesota country elevators. Trucks accounted for 93 percent of the total shipments to the Twin Cities and Red Wing.

FIGURE 10

UPPER MIDWEST COUNTRY ELEVATOR FLAX SHIPMENTS  
TO THE TWIN CITIES AND RED WING, 1979

(thousand bushels)



## RYE

U.S. rye production has been on the decline since the mid-60's as acreage has been diverted to more profitable crops. Minnesota, which produced 2.27 million bushels, ranked fourth in 1979 behind South Dakota, North Dakota and Georgia. Most of the rye produced in the Dakotas and Minnesota is shipped to Minnesota processors or terminal elevators for transshipment. U.S. exports of rye have fluctuated widely in the past ten years from 50,000 bushels in 1976-77 to 27.5 million bushels in 1973-74.

### Rye Movements Into and Within Minnesota

Upper Midwest country elevator shipments of rye in 1979 were an estimated 10.1 million bushels. Most of the rye moving into the state originated in the Dakotas. Railroads accounted for 51 percent of the movements.

Processors and terminal elevators in the Twin Cities received an estimated 4.4 million bushels (Figure 11). Rail accounted for 46 percent of the shipments. Half of the shipments originated in South Dakota. Roughly 800,000 bushels originated in Minnesota.

Port terminal elevators in Duluth/Superior received 3.2 million bushels of rye. Rail accounted for 63 percent of the rye received. Both Dakotas accounted for 1.4 million bushels.

Another 2.6 million bushels were shipped to other Minnesota destinations, including processors and other country elevators. Railroads accounted for 37 percent of the shipments.

### Rye Movements Out of Minnesota

Shipments of rye from terminal elevators to out-of-state destinations was 5.1 million bushels. Terminal elevators in the Twin Cities accounted for

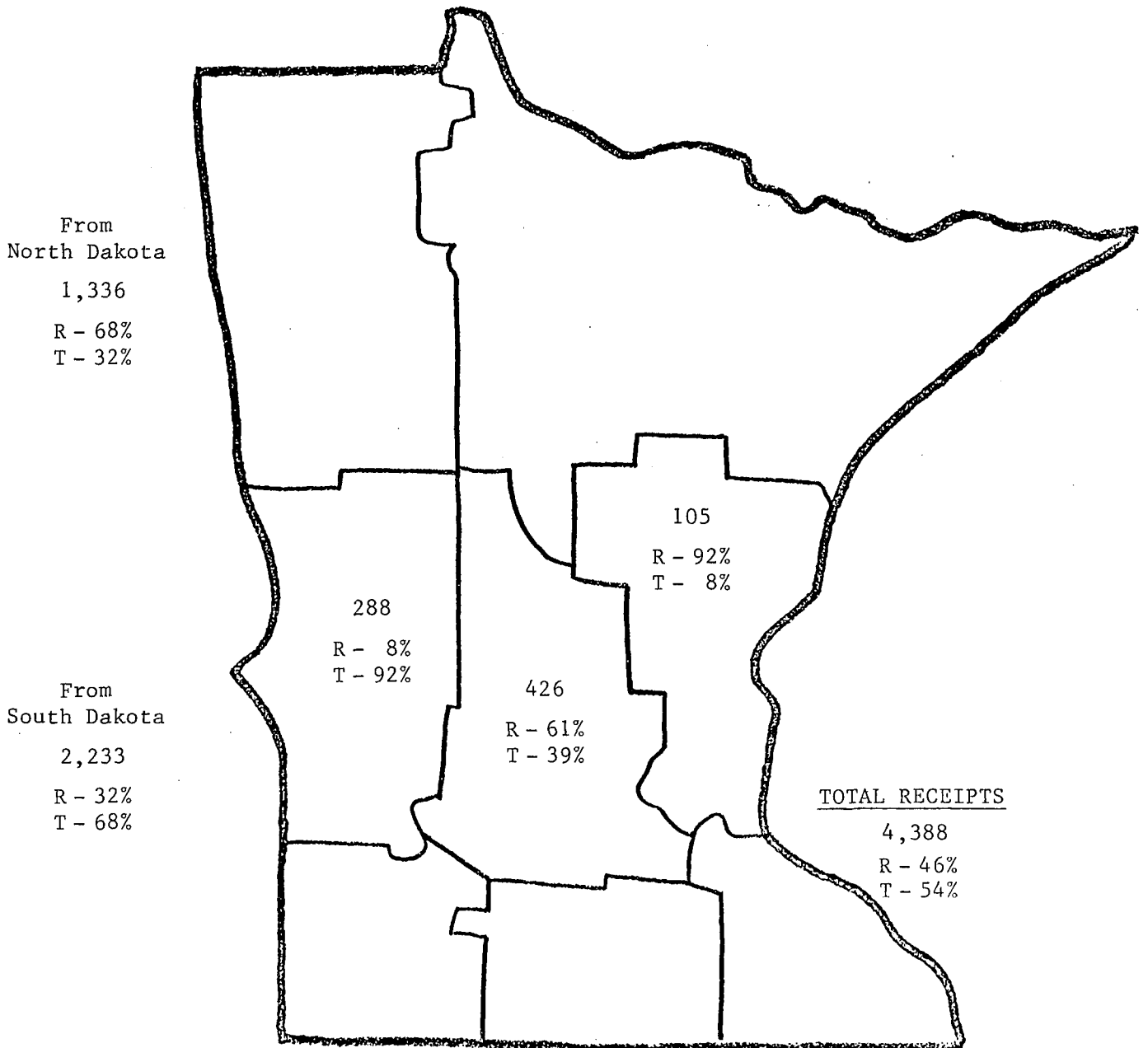
44 percent (2.2 million bushels) of the shipments. The largest share of the shipments out of the Twin Cities was by rail to processors in the east.

Only 238,000 bushels were shipped by barge, probably to southern states.

Duluth/Superior exported 2.9 million bushels through the Great Lakes.

Finland and Canada were the major buyers.

FIGURE 11  
UPPER MIDWEST COUNTRY ELEVATOR RYE  
SHIPMENTS TO THE TWIN CITIES  
(thousand bushels)



## SUMMARY AND IMPLICATIONS

The cash grain movement patterns in 1979, described in this report, reveal the importance of Minnesota as a market and gathering point for Upper Midwest grain. Roughly 57 million bushels of barley, 16 million bushels of oats, 24.1 million hundredweight of sunflowers, 8.2 million bushels of flax and 8.6 million bushels of rye were shipped into Minnesota by country elevators in other states. In addition, country elevators in Minnesota shipped 32 million bushels of barley, 12 million bushels of oats, 11.3 hundredweight of sunflowers, 2.3 million bushels of flax and 1.6 million bushels of rye to in-state destinations. Grain not processed in-state moved into foreign and domestic markets via rail and water modes of transportation.

All the transportation modes, truck, rail and water, are important in marketing Minnesota and Upper Midwest barley, oats, sunflowers, flax and rye. In 1979, rail was the predominant mode of transportation for barley, oats and rye shipped into and within Minnesota. Truck was the predominant mode for flax and sunflower shipments into and within Minnesota. Water modes of transportation, either barge or vessel, accounted for the majority of barley, oats, sunflower and rye shipments out of Minnesota.

Although more and more corn and soybean, and more recently wheat, have been moving directly out-of-state from country elevators in multiple-car units of 26 cars or more, this trend has not been apparent for other grains in Minnesota. Reasons include the lack of demand for these grains at deepwater ports and the lack of volume at both the point of origin and the point of destination.

Currently, the Upper Midwest marketing and transportation is undergoing changes and adjustments. These include serious financing problems for state and local roads, continued railroad abandonments, bankruptcies and consolidations, transportation deregulation and increased waterway and port user charges.

Important to the efficient marketing and transportation of Upper Midwest barley, oats, sunflowers, flax and rye will be a well maintained rail and highway system to the Twin Cities and Duluth/Superior. Also, important is the maintenance of an adequate rail link to the east, and adequate water links through the Great Lakes and to deepwater ports at the Gulf of Mexico.

It is important that these problems and trends be recognized and addressed by both the state and the private sector. Coordination and planning will be necessary to maintain the essential infrastructure required to move Minnesota cash grain into foreign and domestic markets throughout the decade. Minnesota's agricultural prosperity will depend upon an adequate and flexible commodity transportation system.

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