

**SHIPMENTS OF POTATOES FROM THE  
NORTH DAKOTA-MINNESOTA  
RED RIVER VALLEY**

**By**

**David C. Nelson  
Donald E. Walstad**

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**SEPTEMBER - AUGUST 1966-67  
(A PILOT STUDY)**

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**DAVID C. NELSON  
DONALD E. WALSTAD**

**UPPER GREAT PLAINS TRANSPORTATION INSTITUTE  
NORTH DAKOTA STATE UNIVERSITY  
P. O. BOX 5074  
FARGO, NORTH DAKOTA 58105**

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SHIPMENTS OF POTATOES FROM  
THE NORTH DAKOTA-MINNESOTA RED RIVER VALLEY  
SEPTEMBER-AUGUST, 1966-67  
(A PILOT STUDY)

David C. Nelson and Donald E. Walstad<sup>1</sup>

The average production of potatoes in North Dakota was about 13,534,500 hundredweights 1964 through 1967.<sup>2</sup> During this four-year period, over 95 percent of the production occurred in the Red River Valley or the Northeast and East Central crop reporting districts. Therefore, the major focus of this study is on the distribution of potatoes from this 12-county area.

Where production of a product is concentrated in a large area, it is important to have recent data concerning the marketing of the product. Changes in marketing systems can only be made with an accurate knowledge of the consuming markets and the manner in which the product is shipped.

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<sup>1</sup>Nelson is Director of the Upper Great Plains Transportation Institute. Walstad is a senior student in agricultural economics graduating in June, 1968, with the B.S. degree. The data used in this study was developed by Walstad for a senior research paper during the spring academic quarter 1968.

<sup>2</sup>North Dakota Crop and Livestock Statistics, Annual Summary for 1967, Revisions for 1966, Agricultural Statistics No. 18, Department of Agricultural Economics, North Dakota State University and Statistical Reporting Service, U.S.D.A., Fargo, May, 1968, pp. 43-44.

### Purpose of the Study

The primary purpose of this study was simply to determine the destinations of potatoes shipped from the Red River Valley. This analysis includes the volume shipped to each area and the type of market within each destination area, that is, the potatoes were categorized as table stock, institutional stock, or seed stock.<sup>3</sup> Each type of potato is ultimately consumed in each destination area in homes, institutions, or as seed. A second objective was to determine the mode of transportation used to ship potatoes to market. The share of each kind of market (table, institutional, and seed) claimed by the two modes, rail and truck, was also determined.

### Procedure

Questionnaires were mailed to 53 potato shippers located in the Red River Valley. Each of the shippers were asked to report the total hundredweight volume of table, institutional, and seed stock potatoes shipped to each of nine destination areas in the United States (Figure 1). The questions were further broken down such that each shipper would report this volume by each of four seasons of the

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<sup>3</sup>Table stock potatoes include those destined for home use. Institutional stock potatoes includes those destined for processing, restaurants, hospitals, hotels, military, and schools.

marketing year; September–November, December–February, March–May, and June–August. In addition, each shipper was asked to report the hundredweight volume of each class of potatoes shipped by rail and by motor carrier.

Sixteen completed questionnaires were returned of which 11 were usable. In order to expand the data available from these questionnaires to represent the total population (all of the shippers), a ratio multiplier was employed. One of the usable questionnaires was sufficiently different from the other ten that it was temporarily set aside. Therefore, a ratio multiplier of 5.2 ( $52 \div 10$ ) was used to expand the reported data for each of the ten questionnaires. The eleventh questionnaire was then added to the resulting expanded data to obtain the estimated total for the 53 original shippers. This process of data expansion assumes that the non-respondents behave in much the same fashion as the respondents.

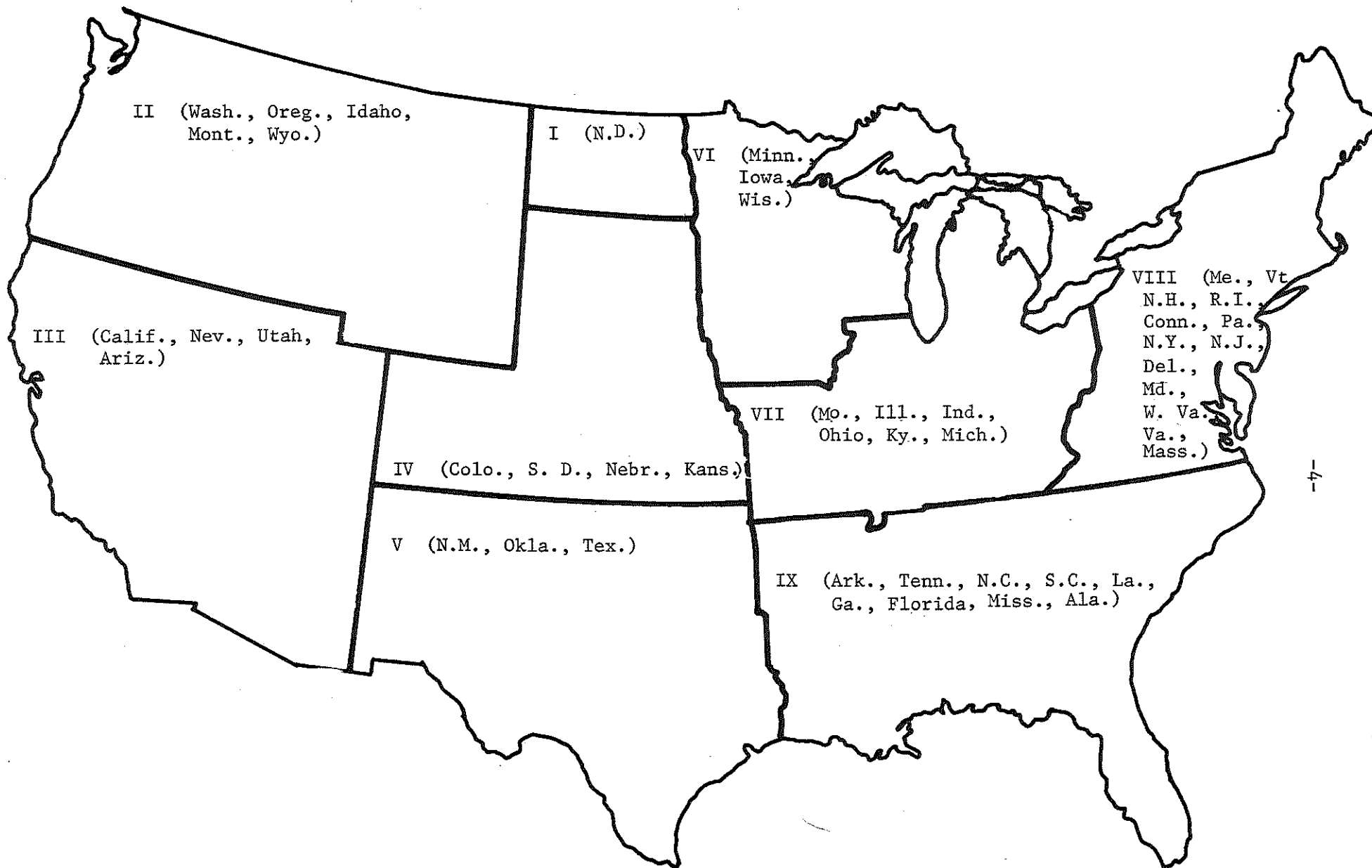


FIGURE 1. DESTINATION AREAS FOR POTATOES SHIPPED FROM THE RED RIVER VALLEY OF NORTH DAKOTA-MINNESOTA.



All Potatoes

Potatoes are generally shipped during the period of September through May. During the period examined about 36.5 percent were shipped during December-February, 33 percent during March-May and 28 percent during September-November. Approximately 2 percent were shipped during June through August (Table 1).

TABLE 1. DESTINATION OF ALL POTATOES FROM THE RED RIVER VALLEY, NORTH DAKOTA-MINNESOTA, SEPTEMBER-AUGUST, 1966-67.

Area Destination	Season				Total
	Sept-Nov	Dec-Feb	Mar-May	June-Aug	
	(hundredweight)				
I	58,046	67,850	356,582	19,875	502,353
II	36,889	121,757	198,077	6,625	363,348
III	0	81,015	27,527	0	108,542
IV	738,650	928,846	924,809	13,250	2,605,555
V	225,250	844,760	296,624	0	1,366,634
VI	431,562	549,766	796,346	116,250	1,893,924
VII	324,084	668,365	463,091	0	1,455,540
VIII	18,444	23,532	17,894	0	59,870
IX	1,541,588	1,069,142	851,277	103,000	3,565,007
TOTAL	3,374,513	4,355,033	3,932,227	259,000	11,920,773

Over 50 per cent of all potatoes shipped are destined to two general geographic areas of the United States; the Southeast and the Upper Great Plains. About 30 percent are shipped into the Southeast (Region IX) and about 22 percent into the Upper Great Plains (Region IV).

More than 95 percent of the total 1966-67 shipments were destined to the Great Plains, the Midwest, and the Southeast. Less than 5

percent of the total is destined to the Southwest, Northwest, and Northeast (Figure 2).

Approximately 65 percent of the shipments during this period were moved by rail. The remaining 35 percent were shipped by motor carrier (Table 2).

TABLE 2. MODE OF TRANSPORTATION USED TO SHIP ALL POTATOES FROM THE RED RIVER VALLEY, NORTH DAKOTA-MINNESOTA, SEPTEMBER-AUGUST, 1966-67.

Mode	Hundredweight	Percent
Railroad	7,772,627	65
Motor Carrier	4,148,146	35
TOTAL	11,920,773	100

Table Stock Potatoes

Nearly 58 percent of all potatoes shipped during the period were sold as table stock potatoes. Nearly 97 percent of this total was shipped during the nine-month period of September through May. About 35 percent were shipped during December-February, 33 percent during September-November, and 29 percent during March-May (Table 3).

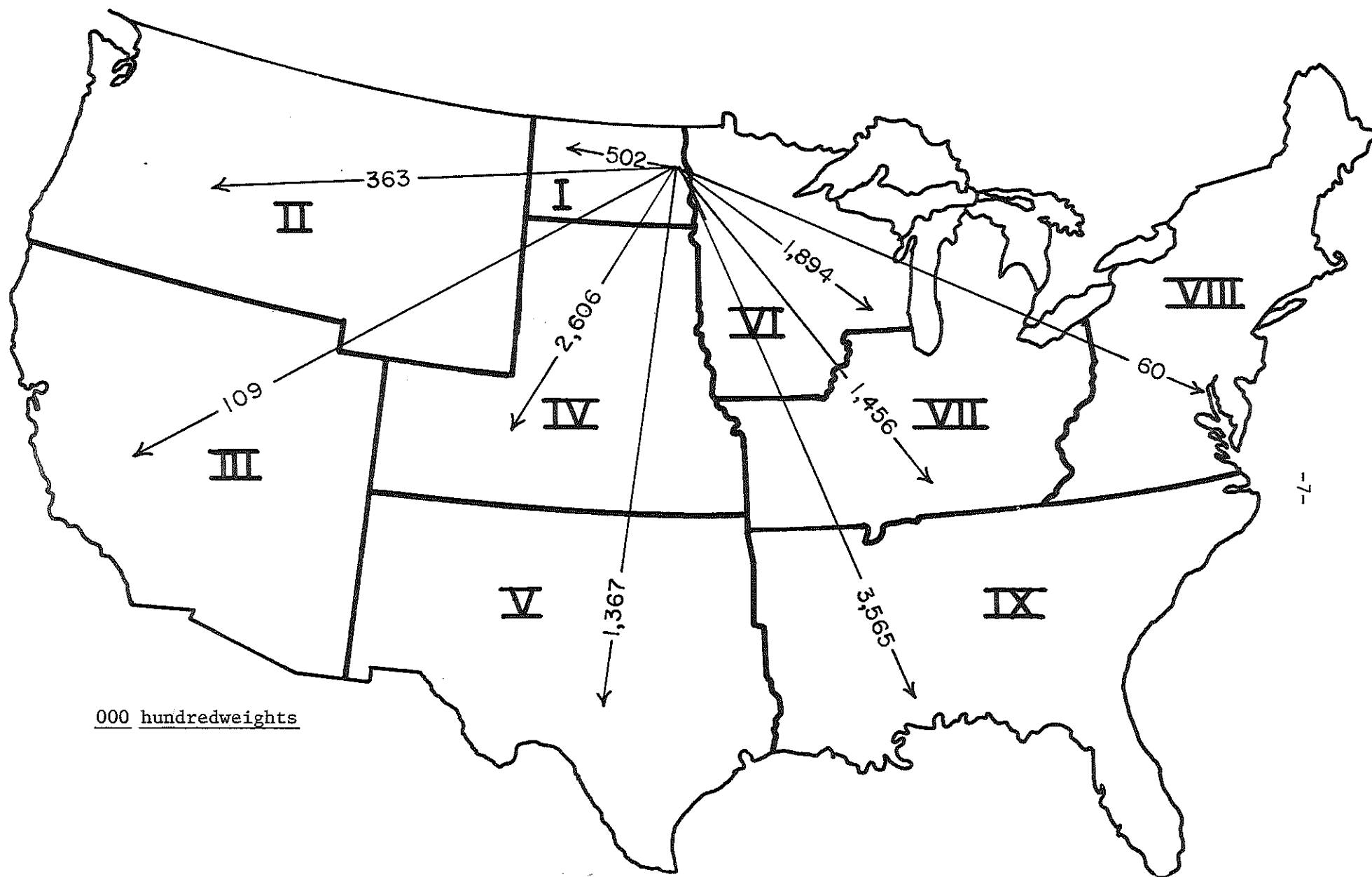


FIGURE 2. AREA DESTINATIONS OF ALL POTATOES SHIPPED FROM THE RED RIVER VALLEY, SEPTEMBER-AUGUST, 1966-67.

TABLE 3. DESTINATION OF TABLE STOCK POTATOES FROM THE RED RIVER VALLEY, NORTH DAKOTA-MINNESOTA, SEPTEMBER-AUGUST, 1966-67.

Area Destination	Season				Total
	Sept-Nov	Dec-Feb	Mar-May	June-Aug	
	(hundredweight)				
I	0	0	6,168	0	6,168
II	36,889	81,249	79,500	0	197,638
III	0	0	0	0	0
IV	579,650	630,223	605,498	0	1,815,371
V	119,250	95,400	119,250	0	333,900
VI	420,962	536,516	381,370	103,000	1,441,848
VII	317,634	618,897	239,359	0	1,175,890
VIII	18,444	23,532	0	0	41,976
IX	801,242	482,751	585,127	103,000	1,972,120
TOTAL	2,294,071	2,468,568	2,016,272	206,000	6,984,911

Approximately 54 percent of the table stock potatoes were shipped to the Southeast and the Upper Great Plains; 28 percent to the Southeast and 26 percent to the Upper Great Plains. The Midwest areas (Regions VI and VII) received another 37 percent. Thus, nearly all of these potatoes are sold to markets in the Upper Great Plains, the Midwest, and the Southeast (Figure 3).

About 69 percent of the total table stock potatoes shipped were moved by railroad. The remaining 31 percent were shipped by motor carrier (Table 4).

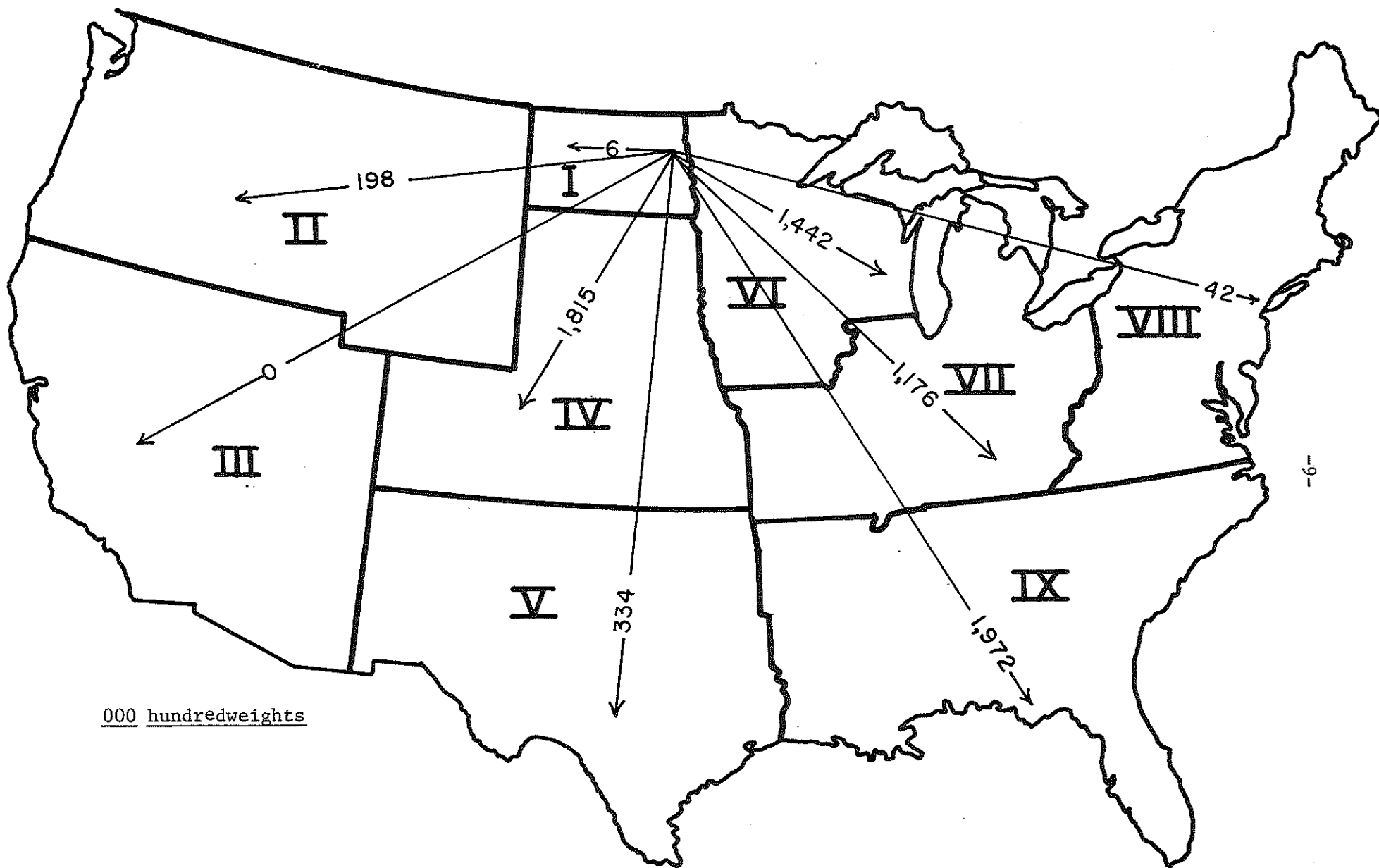


FIGURE 3. AREA DESTINATIONS OF TABLE STOCK POTATOES SHIPPED FROM THE RED RIVER VALLEY, SEPTEMBER-AUGUST, 1966-67.

TABLE 4. MODE OF TRANSPORTATION USED TO SHIP TABLE STOCK POTATOES FROM THE RED RIVER VALLEY, NORTH DAKOTA-MINNESOTA, SEPTEMBER-AUGUST, 1966-67.

Mode	Hundredweight	Percent
Railroad	4,754,702	69
Motor Carrier	2,230,209	31
TOTAL	6,984,911	100

Institutional Stock Potatoes

Less than 10 percent of all potatoes shipped during the period were shipped to institutions (defined in footnote 3). The largest portion of this class of potatoes is shipped during the period of September through May. About 37 percent were shipped during December-February, 31 percent during March-May, and 30 percent during September-November (Table 5).

TABLE 5. DESTINATION OF INSTITUTIONAL STOCK POTATOES FROM THE RED RIVER VALLEY, NORTH DAKOTA-MINNESOTA, SEPTEMBER-AUGUST, 1966-67.

Area Destination	Season				Total
	Sept-Nov	Dec-Feb	Mar-May	June-Aug	
(hundredweight)					
I	58,046	3,038	3,332	0	64,416
II	0	0	0	0	0
III	0	0	0	0	0
IV	159,000	251,750	161,250	13,250	585,250
V	106,000	121,697	119,326	0	347,023
VI	10,600	13,250	13,250	13,250	50,350
VII	6,450	31,901	56,334	0	94,685
VIII	0	0	0	0	0
IX	0	0	0	0	0
TOTAL	340,096	421,636	353,492	26,500	1,141,724

Over 50 percent of these potatoes were shipped to the Upper Great Plains area (Region IV). About 30 percent were shipped to the Upper Midwest area (Region VI) with another 8 percent shipped to the Midwestern states (Region VII).

Approximately 88 percent of the potatoes shipped to institutions were shipped by motor carrier. The remaining 12 percent moved by railroad (Table 6).

TABLE 6. MODE OF TRANSPORTATION USED TO SHIP INSTITUTIONAL STOCK POTATOES FROM THE RED RIVER VALLEY, NORTH DAKOTA-MINNESOTA, SEPTEMBER-AUGUST, 1966-67.

Mode	Hundredweight	Percent
Railroad	139,863	12
Motor Carrier	1,001,861	88
TOTAL	1,141,724	100

Seed Potatoes

Nearly 32 percent of the potatoes shipped during the period were sold for seed. Nearly 80 percent of this class of potatoes were shipped during the period of December-May. About 19.5 percent were shipped during September-November (Table 7).

Forty-two percent of seed potatoes shipped during the period were destined to the Southeast (Region IX). The next largest amount, 18 percent were destined to the Southern Great Plains (Region V). About 11 percent remained within the state (Region I).

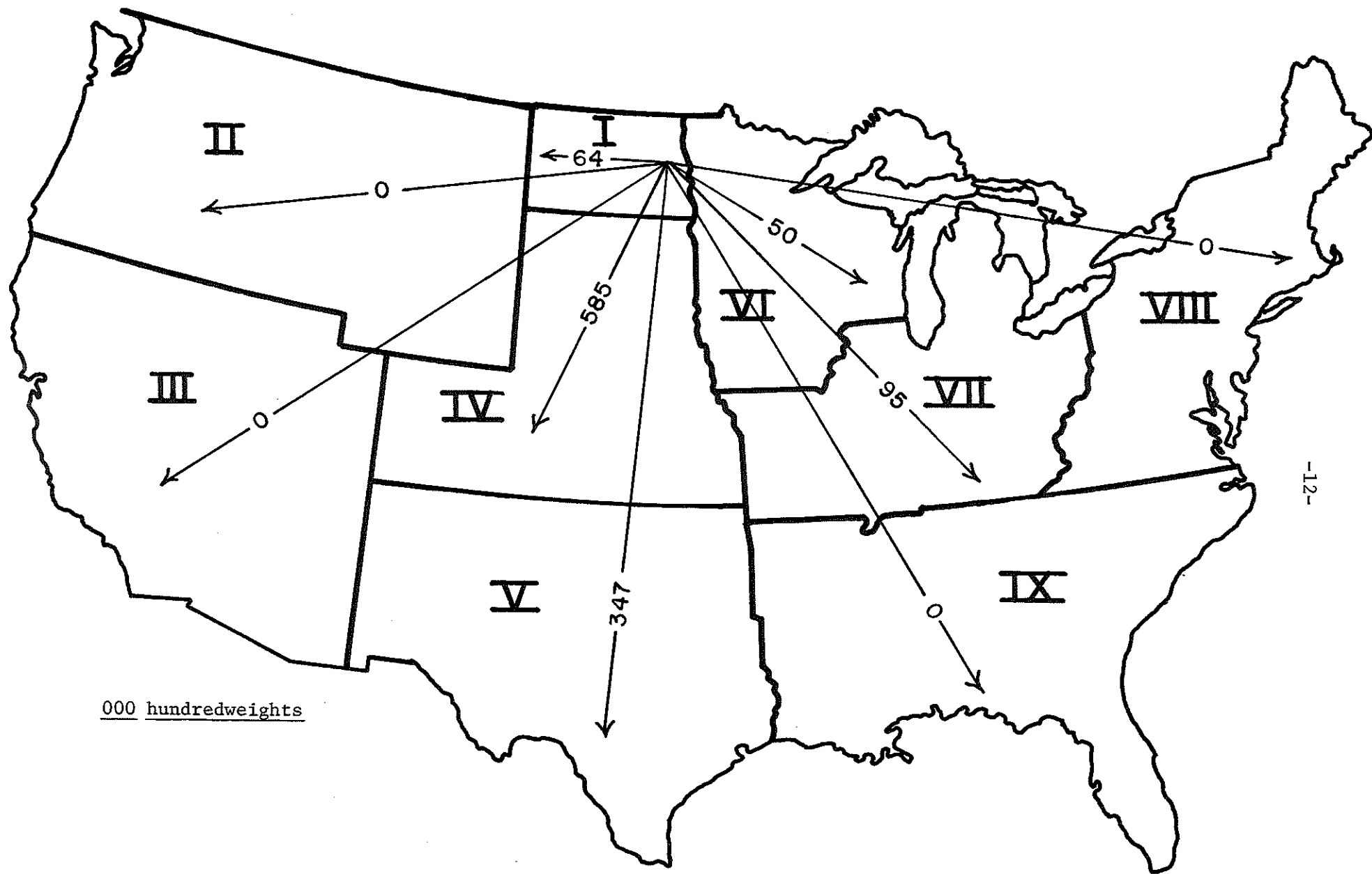


FIGURE 4. AREA DESTINATIONS OF INSTITUTIONAL STOCK POTATOES SHIPPED FROM THE RED RIVER VALLEY, SEPTEMBER-AUGUST, 1966-67.



TABLE 7. DESTINATION OF SEED POTATOES FROM THE RED RIVER VALLEY, NORTH DAKOTA-MINNESOTA, SEPTEMBER-AUGUST, 1966-67.

Area Destination	Season				Total
	Sept-Nov	Dec-Feb	Mar-May	June-Aug	
(hundredweight)					
I	0	64,812	347,082	19,875	431,769
II	0	40,508	118,577	6,625	165,710
III	0	81,015	27,572	0	108,542
IV	0	46,873	158,061	0	204,934
V	0	627,663	58,048	0	685,711
VI	0	0	401,726	0	401,726
VII	0	17,567	167,398	0	184,965
VIII	0	0	17,894	0	17,894
IX	740,346	586,391	266,150	0	1,592,887
TOTAL	740,346	1,464,829	1,562,463	26,500	3,794,138

Approximately 76 percent of the seed potatoes were shipped by rail. The remaining 24 percent were distributed by motor carrier (Table 8).

TABLE 8. MODE OF TRANSPORTATION USED TO SHIP SEED POTATOES FROM THE RED RIVER VALLEY, NORTH DAKOTA-MINNESOTA, SEPTEMBER-AUGUST, 1966-67.

Mode	Hundredweight	Percent
Railroad	2,878,062	76
Motor Carrier	916,076	24
TOTAL	3,794,138	100

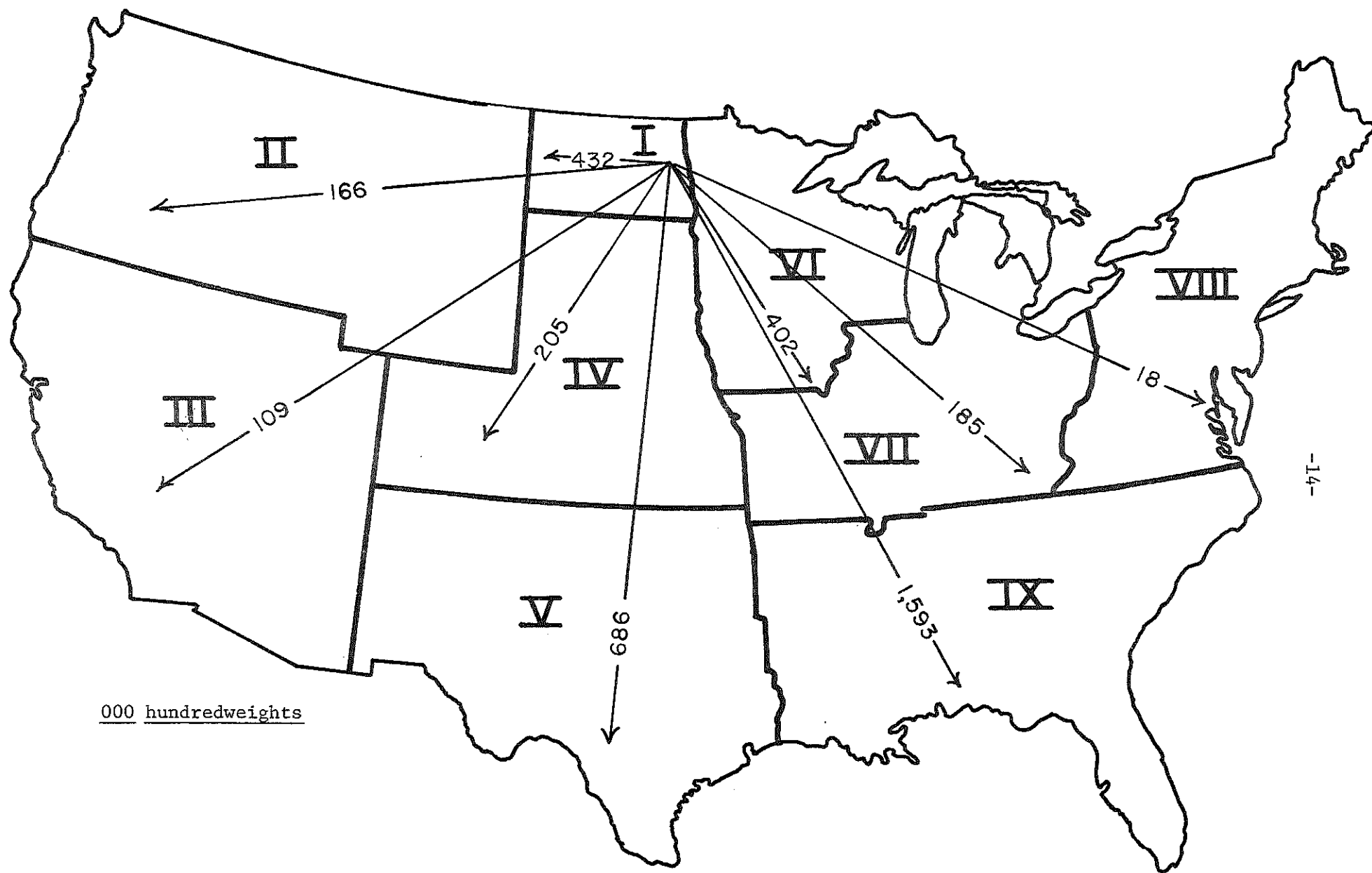


FIGURE 5. AREA DESTINATIONS OF SEED POTATOES SHIPPED FROM THE RED RIVER VALLEY, SEPTEMBER-AUGUST, 1966-67.