TRANSPORTATION TRENDS AND SEASONAL FACTORS IN THE MARKET DISTRIBUTION OF MICHIGAN BEANS

Thesis for the Degree of M. A.
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Donald R. Stokes

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THESIS

TRANSPORTATION TRENDS AND SEASONAL FACTORS IN THE MARKET DISTRIBUTION OF MICHIGAN BEANS

Transportation Trends and Seasonal Factors in the Market Distribution of Michigan Beans

A Thesis

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TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

LIST OF TABLES

LIST OF FIGURES

LIST OF FIGURES (continued)

LIST OF FIGURES (continued)

INTRODUCTION

Bean Production in Michigan. The white pea bean, commonly called navy bean, is one of Michigan's most important cash crops. The average annual production for the ten-year period 1929-1938 was 3,973,800 bags of 100 pounds with an average annual value of $10,214,600. The average annual Michigan acreage of beans harvested during this period was 560,600.[1] According to the 1935 Census of Agriculture, 56,775 farmers, representing 30 per cent of the farms in the state, grew beans. Since 1934 the yearly farm cash income from beans has averaged approximately 12 per cent of the total annual cash income from all crops in Michigan.

Beans are grown in practically every county in the lower peninsula of Michigan with the heaviest concentration in the Saginaw Valley and "Thumb" district. In 1934 Huron county had the largest acreage of beans with 75,731 acres, and Sanilac, Tuscola and Saginaw counties ranked next in importance. The bean crop is unimportant north of the Saginaw Valley with the exception of Arenac county but is fairly well distributed over the south-central and eastern part of the state, as shown in Figure 1.

From 1932 to 1937 Michigan produced approximately 88 per cent of the total pea bean production in the United States and 35 per cent of the total domestic crop of all varieties of field beans. The other important commercial varieties are the Lima, Pinto, Great Northern, and Red Kidney which are respectively grown chiefly in California, Colorado, Idaho and Michigan. Of these four varieties the only real competitor of Michigan pea beans is

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1. "Michigan Crop Report: Annual Crop Summary." Div. of Crop and Livestock Estimates, Bur. of Agr. Econ., U.S.D.A. 1938.

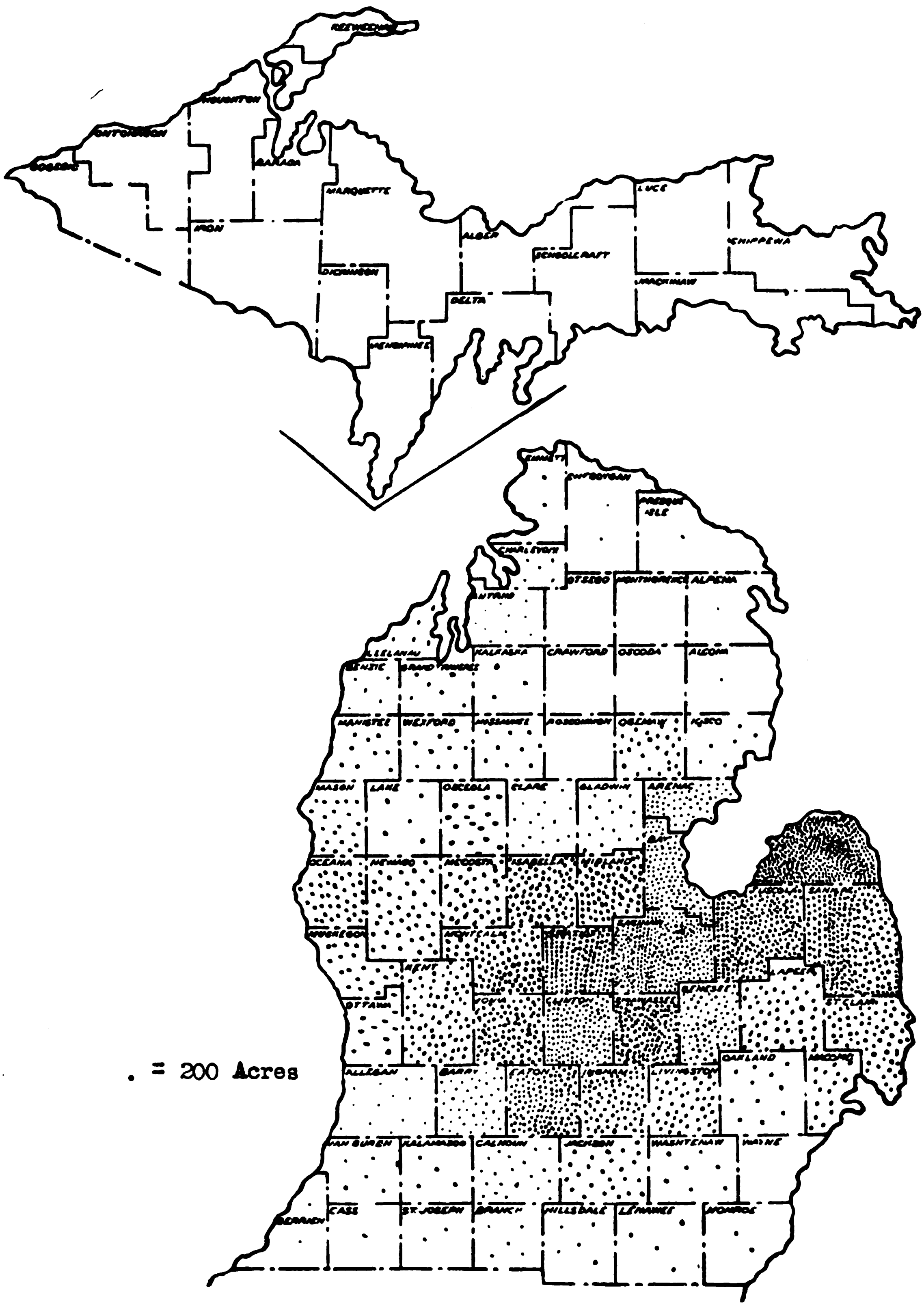

Figure 1. - Distribution of Michigan Bean Acreage, 1934.

the Great Northern which competes to some extent in the dry bean trade but only to a slight degree in the canning trade.[1]

For the crop year 1937-38 Michigan ranked first among the states in acreage of beans and second only to California in production. The acreage and production of dry edible beans in the more important states since 1924 are shown in Tables 1 and 2. Farm prices of Michigan beans fluctuate more widely than either acreage or yield. Table 3 shows the farm price of Michigan field beans as of the 15th of each month from 1929 to 1938.

Trade Channels. The marketing system for beans is similar to those employed for other field crops. The farmers sell their beans to local elevators, who in turn usually sell them to jobbers or ship them to a terminal plant for further processing and conditioning. Less frequently some local elevator sales are made through a broker or direct to the dry bean trade. The large shippers or jobbers usually purchase their beans direct from local elevators but to some extent through brokers. The bean shippers have a variety of outlets: canning plants, wholesale grocers, chain stores, brokers and even direct to retailers. The canners, as a rule, purchase their beans from the shippers either for future delivery or immediate shipment, as the storing qualities of beans permit the canning of this product during the "off season" for perishable fruits and vegetables. The dry bean jobbers, however, usually purchase their beans for immediate shipment whenever they consider the price favorable and market them according to the demands of the dry bean trade.

Michigan Bean Shippers Association. The Michigan Bean Shippers Association was organized December 7, 1892, and reorganized and incorporated

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1. Gunn, R. V. "Some Economic Aspects of the Bean Situation." Mich. Agr. Ext. Bul. 107. 1930.

Table 1. - Acreage of Beans Harvested in Principal States, 1924-1937[1]

Year	Michigan	Colorado	Idaho	California	Other States	Total U.S.	Percentage in Michigan
				Thousands of Acres			
1924	625	286	65	206	402	1,584	39.5
1925	650	332	72	240	321	1,615	40.2
1926	637	398	72	305	328	1,740	36.6
1927	567	322	95	296	332	1,612	35.2
1928	521	374	114	307	335	1,651	31.6
1929	575	376	134	339	416	1,840	31.3
1930	690	450	168	363	488	2,159	32.0
1931	635	351	176	334	451	1,947	32.6
1932	552	221	75	225	358	1,431	38.6
1933	567	365	102	275	420	1,729	32.8
1934	632	174	92	299	263	1,460	43.3
1935	562	435	110	339	439	1,885	29.8
1936	466	287	104	347	390	1,594	29.2
1937	485	244	140	386	466	1,721	28.2

1. "Economic Data for Dry Beans, 1922-1937." A.A.A., U.S.D.A. March, 1938.

Table 2. - Production of Dry Edible Beans in Principal States, 1922-1938[1]

Year	Michigan	Colorado	Idaho	California: All Limas	California: Other Varieties	Other States	Total U.S.	Percentage in Michigan
	Thousands of Bags of 100 Pounds							
1922	3,023	318	238	1,508	1,592	1,222	7,901	38.3
1923	3,859	763	454	1,050	1,691	1,770	9,587	40.3
1924	4,125	583	624	705	864	2,198	9,099	45.3
1925	5,265	1,394	778	1,100	1,567	1,603	11,709	45.0
1926	4,586	860	756	1,830	1,484	1,508	11,024	41.6
1927	3,062	1,063	1,054	1,320	1,485	1,753	9,737	31.4
1928	3,439	1,010	1,163	1,291	1,841	1,830	10,574	32.5
1929	3,220	1,316	1,608	1,473	1,918	2,743	12,278	26.2
1930	2,898	2,475	1,915	1,798	2,466	2,581	14,133	20.5
1931	3,556	906	2,024	1,727	1,740	2,961	12,914	27.5
1932	5,078	453	1,020	1,194	1,290	1,970	11,005	46.1
1933	4,139	1,204	1,408	1,573	1,947	2,500	12,771	32.4
1934	4,178	376	1,205	1,780	1,904	1,950	11,393	36.7
1935	5,114	1,174	1,265	1,525	2,440	2,805	14,323	35.7
1936	2,656	1,091	1,373	1,995	2,086	2,204	11,405	23.3
1937	4,559	781	1,932	2,561	2,808	3,198	15,839	28.8
1938*	4,738	1,015	1,482	2,050	2,128	2,796	14,209	33.3

1. "Economic Data for Dry Beans, 1922-1938." A.A.A., U.S.D.A. October, 1938.

Table 3. - Farm Price of Michigan Beans, 1928-29 to 1937-38[1]
(Price on 15th of each month)

Crop Year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Ave.
						Dollars per 100 pounds							
1928-29	8.25	8.30	7.50	6.50	8.50	9.30	9.00	8.40	8.55	8.55	7.95	8.40	8.27
1929-30	6.50	5.35	4.20	4.00	6.20	6.10	5.50	5.30	5.80	5.50	5.05	5.75	5.44
1930-31	2.50	2.05	2.20	1.85	3.90	3.95	3.65	3.70	3.70	3.50	3.30	3.25	3.13
1931-32	1.40	1.30	1.05	.95	1.65	1.65	1.60	1.55	1.50	1.45	1.40	1.55	1.42
1932-33	2.65	2.00	2.35	2.20	.95	.95	1.10	1.60	2.20	1.95	2.50	2.80	1.94
1933-34	3.35	3.00	2.50	2.50	2.30	2.40	2.25	2.00	2.15	2.15	2.20	2.55	2.45
1934-35	2.20	2.00	1.80	1.75	2.65	2.65	2.80	2.80	2.75	2.65	2.65	2.40	2.42
1935-36	4.60	5.20	5.80	6.00	1.85	2.05	1.90	2.05	2.35	2.30	3.55	4.70	3.53
1936-37	3.10	3.00	2.30	2.50	6.40	7.50	7.10	6.90	6.30	6.00	5.70	4.20	5.08
1937-38	2.05	1.80	1.75	1.70	2.60	2.60	2.50	2.30	2.45	2.45	2.75	2.10	2.25
Average	3.66	3.40	3.15	3.00	3.70	3.92	3.74	3.66	3.78	3.65	3.71	3.77	

1. "Michigan Crop Report: Annual Crop Summary." Div. of Crop and Livestock Estimates, Bur. of Agr. Econ., U.S.D.A. 1938.

January 28, 1913. Its membership consists largely of independent and co-operative elevators and bean jobbers who are regular members; bean dealers, canners, wholesale grocers, brokers and trade journals who are associate members; and honorary members who are elected to the association in the same manner as regular members but are exempt from payment of dues and have no voting privileges. Its chief functions are the publication of daily bean prices and the supervision of bean grading throughout the state, but it also serves as a conventional trade association, supplying current trade information, sponsoring improvements in the marketing processes and other activities for the general trade betterment.

As the association has been chiefly responsible for the grading of Michigan beans (the Federal government maintained one or two inspectors in the state for a short period) the inspection records of this organization were used in this study as the basis of determining the quality of Michigan bean shipments. Some inspections have been made by the Federal government, but the great majority of all inspections of Michigan beans were made by the association and were considered representative of the Michigan bean industry for the purposes of this study.

Michigan Elevator Exchange. The Michigan Elevator Exchange is a federated type of cooperative with eighty-three local cooperative elevator associations comprising its membership. The Exchange was organized in 1920 to function as a sales agency on behalf of its members and since the date of its organization has proven to be a successful enterprise; its volume of business steadily increasing from 1,574 carloads of grain and beans in 1921 to 6,102 carloads in 1936.[1]

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1. Hedrick W. O. "A Decade of Michigan Cooperative Elevators." Mich. Agr. Exp. Sta. Spec. Bul. 291. 1938.

The Exchange deals with its member elevators on a "sale and purchase" basis; that is, it takes title to the commodity when purchased and, when sold, receives the profit or loss of the transaction. Although organized to act as a central sales agency for its member elevators, the Exchange deals with non-members as well, thus being able to act in the same capacity as other grain and bean jobbers. Patronage dividends (cash or stock) have been paid to members each year since the organization of the Exchange, the total distributions being in excess of $500,000.

Additional services have been provided for its member elevators by its acquisition of a large terminal elevator located at Port Huron. This terminal plant with its facilities for processing, conditioning and storing of beans enables the organization to provide an integrated marketing service from the farmer to the canning and grocery trade. Other benefits which the member elevators derive from the Exchange include assistance in their traffic problems, price quotations, market advice and general trade information.

The operations of the Exchange extend over practically the entire state and are of particular importance in the bean producing area. It is estimated that the Exchange moves 25 to 30 per cent of the total Michigan bean crop; the exact proportion depends upon the size and quality of the crop and competitive factors in the market.

Purpose of Study. The purpose of this study is to examine certain trends existing in the marketing processes of the Michigan bean industry, an important factor in Michigan's agricultural economy. New problems are constantly arising. Changing methods of transporting Michigan beans are causing widespread difficulties affecting the whole industry. Problems confronting members of the trade are caused by the interrelating effects of changing transportation methods, market quality variations, and

changing sales outlets. An attempt has been made in this study to reveal and analyze these trends and interrelated effects in order to suggest possible changes in the marketing practices employed by farmers, local elevators, jobbers and other members of the trade. Although the word "trends" usually refers to a downward or upward movement over a consecutive number of years, it was used in this study to indicate the directional movement of certain variables revealed by the data.

Scope and Methods. Due to the importance of the Michigan Elevator Exchange in the bean industry of the state, the transactions of this organization were considered representative of the industry for the purposes of this study. All records concerning the points of origin, processing and destinations of Michigan bean shipments were secured from the Exchange. The crop years of 1932-33, 1936-37 and 1937-38 were selected for use in this study. Data for the months of July and August in 1938 were not available. The reasons for the selection of these three seasons are: (1) the crop year of 1932-33 was characterized by heavy production, low prices per unit and a wide distribution; (2) the season of 1936-37, a short crop, was characterized by a high "pick" due to wet weather, thus presenting an opportunity to study certain processing trends; (3) the crop year of 1937-38 brings the trends up to date; and (4) such a six year period provides a more complete perspective of the existing trends. The crop years of 1932-33 to 1937-38, inclusive, were used in the quality section of this study. It seemed desirable to use the complete six year period in order to achieve a more accurate analysis of the quality trends.

Sources of Data. The primary data used in this study were obtained through the courtesy of the Michigan Elevator Exchange and the Michigan

Bean Shippers Association. All records concerning purchases and sales of the Exchange were obtained from its central sales office at Lansing, and records concerning the origin and amount of shipments by the terminal plant were secured from the Exchange terminal elevator at Port Huron. The data concerning inspections and quality were obtained from the Secretary of the Michigan Bean Shippers Association at Saginaw.

The secondary data were secured from publications of the United States Department of Agriculture, the United States Census, Annual Crop Summaries of the Michigan Crop Reporting Service and bulletins of the Michigan Agricultural Experiment Station concerned with the bean industry of the state.

Review of Literature. Previous studies published by the Michigan Agricultural Experiment Station[1] have considered production and marketing problems and also the general economic aspects of the Michigan bean industry. The bulletin by Hedrick, "Marketing Michigan Beans," was largely concerned with a description of the general marketing procedure employed in the Michigan bean industry, while a later bulletin by the same author, "A Decade of Michigan Cooperative Elevators," was primarily concerned with type of organization and the financial structure of local cooperative elevators. The publication by Gunn, "Some Economic Aspects of the Bean Situation," presented the general economic outlook for the Michigan bean industry in 1930. The study by Wright, "The Economics of Bean Production in Michigan," dealt with the farm costs of producing beans in Michigan. A discussion of

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1. Gunn, R. V. "Some Economic Aspects of the Bean Situation." Mich. Agr. Ext. Bul. 107. 1930.
Hedrick, W. O. "A Decade of Michigan Cooperative Elevators." Mich. Agr. Exp. Sta. Spec. Bul. 291. 1938.
____________. "Marketing Michigan Beans." Mich. Agr. Exp. Sta. Spec. Bul. 217. 1931.
Motts, G. N. "The Production-Consumption Balance of Agricultural Products in Michigan." Mich. Agr. Exp. Sta. Bul. 278. 1936.
Wright, K. T. "The Economics of Bean Production in Michigan." Mich. Agr. Exp. Sta. Spec. Bul. 270. 1936.

the balance of the interstate movements of field beans in relation to the Michigan production and consumption was included in a study by Motts, "The Production-Consumption Balance of Agricultural Products in Michigan." In Montana and New York, studies by Renne and Young were primarily concerned with the marketing procedure and economic aspects of bean production in their respective states.[1] A more recent publication, "Major Economic Trends in the Dry Edible Bean Industry" issued by the United States Department of Agriculture treated the whole domestic dry bean industry in respect to production trends, prices, crop movements, foreign trade, and freight rates.[2]

This study is primarily concerned with the interrelating effects of changing transportation methods, seasonal and market quality variations and changing sales outlets upon the Michigan bean industry. Although most attention was given to the trend in transportation, it was necessary to correlate market quality, market distribution, and seasonal variations in the size and condition of the crop with the transportation trend in order to arrive at the interrelating effects of these factors upon the Michigan bean industry.

Definition of Terms. In order to avoid possible misunderstanding some of the terms employed in this study are defined as follows:

Consuming trade refers to those distributing agencies in the market which include canneries, wholesale grocers, chain stores, brokers, commission agents and retailers by which beans reach the ultimate consumer.

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1. Renne, R. R. "The Economics of Bean Production and Marketing in Montana." Mont. Agr. Exp. Sta. Bul. 358. 1932.
   Young, H. N. "Production and Marketing of Field Beans in New York." New York Agr. Exp. Sta. Bul. 532. 1931.
2. Pond, R. K. "Major Economic Trends in the Dry Edible Bean Industry." Div. of Marketing and Marketing Agreements, A.A.A., U.S.D.A. 1938.

Jobbers are those middlemen acting as intermediary agents between the local elevators and the consuming trade. These jobbers may either act as commission agents, own or control local elevators, or deal with local elevators on a "purchase and sale" basis; that is, take title to the commodity when purchased and receive the profits of the transaction when sold.

Local elevators assemble beans from the farmers and are the points of primary origin of bean purchases, sales and shipments by the jobbers to the consuming trade.

Terminal plants are elevators primarily engaged in processing and conditioning beans purchased from local elevators and are usually owned by sales agencies as an accessory to their purchase and sales service.

Points of origin of bean shipments refer to the assembling points of beans in the first instance for market movement from the area of production.

M.B.S.A. refers to Michigan Bean Shippers Association.

Exchange refers to Michigan Elevator Exchange.

Processing represents those operations involved in preparing merchantable grades of beans such as mechanical and handpicking operations.

Conditioning includes those operations involved in fitting subnormal beans for market, such as drying and polishing.

Pick is a term employed by the bean industry to represent the percentage of deviation in quality from the highest grade, Michigan Choice Hand Pick; e.g., a two per cent pick indicates that two pounds per hundredweight are of lower grade than C.H.P.

Carlot or carload of beans consists of 500 bags or its equivalent bulk weight.

Less-carlot or l.c.l. refers to freight shipments in quantities less than the amount on which railway companies permit a carlot freight rate.

Truckload is normally 200 bags or less.

C.H.P. refers to Michigan Choice Hand Picked grade of navy beans.

P.H.P. refers to Michigan Prime Hand Picked grade of navy beans.

C.R.C. refers to Michigan Choice Recleaned grade of navy beans.

Crop year includes the months September to August, inclusive.

TRANSPORTATION TRENDS IN THE MICHIGAN BEAN INDUSTRY

During the last few years motor truck transportation of agricultural products has increased considerably, but not until recently has an appreciable tonnage of Michigan beans moved to market by truck. This change in the method of transportation has given rise to various problems, among which are its effects on: (1) the size of the bean assembling area, (2) the extent of the area of distribution, (3) the sales outlets utilized, (4) the quality of the product marketed.

To determine the transportation trends and their influence on the Michigan bean industry, an analysis is presented of the sources or points of origin of the bean shipments by the Michigan Elevator Exchange and their ultimate destination to the canning and dry bean trade. To compare the methods of transportation this study is divided into three parts: carlot, truck, and less-carlot shipments of beans.

After noting the relationship of transportation methods to the sources of bean shipments, it seemed advisable to consider methods of transportation in respect to influence upon the processing of beans for market distribution. Thus a comparison of shipments through the terminal elevator to those shipped direct from the local elevators was made in respect to method of transportation and distribution between the canning and dry bean trade. Although some local elevators have complete facilities for processing, they usually lack the capacity to perform this function during periods of heavy movement. Consequently, shipments of beans from the terminal plant were considered representative of processed beans in this study.

Origins of Shipments and Methods of Transportation

Carlot Shipments. The sources of carlot shipments of beans by counties for the crop years of 1932-33, 1936-37 and 1937-38 are shown in Figures 2, 3 and 4, respectively. The wide distribution of points of origin of bean shipments in the 1932 season compared with the 1936 and 1937 seasons is largely due to the greater production in that year. St. Clair county appears to be the largest source of carlot shipments of beans due to the location of the Michigan Elevator Exchange terminal elevator in this county. Many local elevators ship their beans direct to the terminal plant for processing, further conditioning, or storing from which they are later moved to the consuming trade.

The distribution of the points of origin of carlot shipments of beans was more restricted in 1936-37 than in 1932-33. There was very little difference between the two years in the amount shipped from St. Clair county although the total carlot shipments in 1932 were nearly double those in 1936. Evidently a much greater proportion of carlot shipments went through the terminal elevator during the latter year. The poor quality crop of 1936 due to wet conditions at harvest time necessitated the processing of a larger proportion of the crop before marketing.

The crop year of 1937-38 was again characterized by a wide distribution of the points of origin of carlot shipments. The high quality 1937 crop with only a three per cent pick made possible a larger proportion of shipments direct from local elevators to the consuming trade and less from the terminal elevator.

Truck Shipments. Figures 5, 6 and 7 show the sources of truck shipments of beans for the crop years of 1932-33, 1936-37 and 1937-38. The

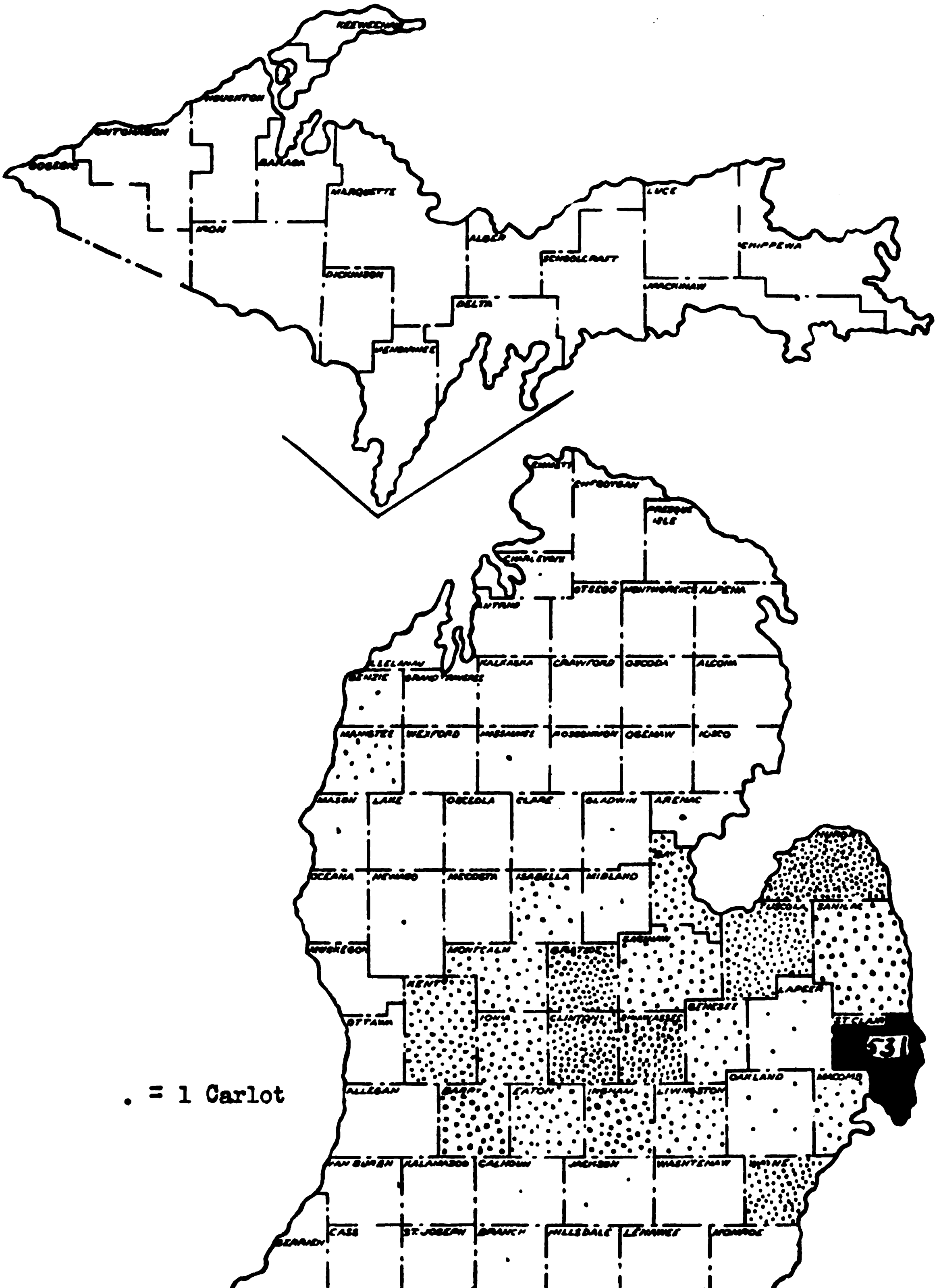


Figure 2. - Sources of Carlot Shipments, 1932-33

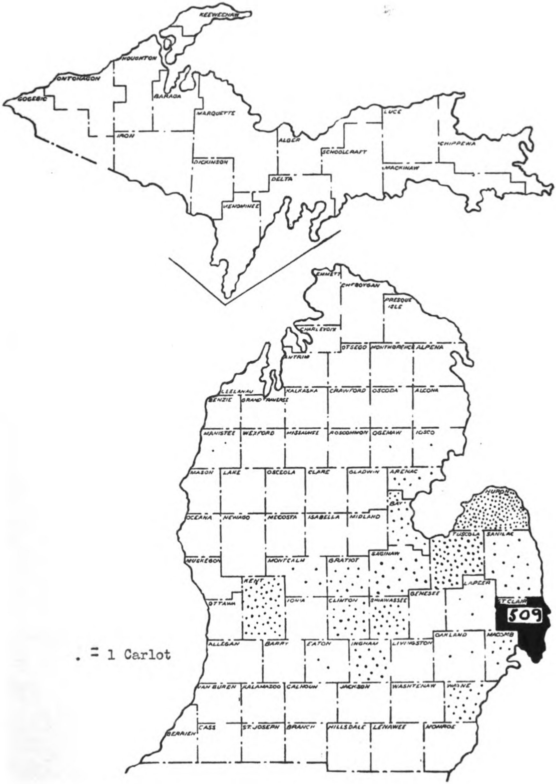


Figure 3. - Sources of Carlot Shipments, 1936-37

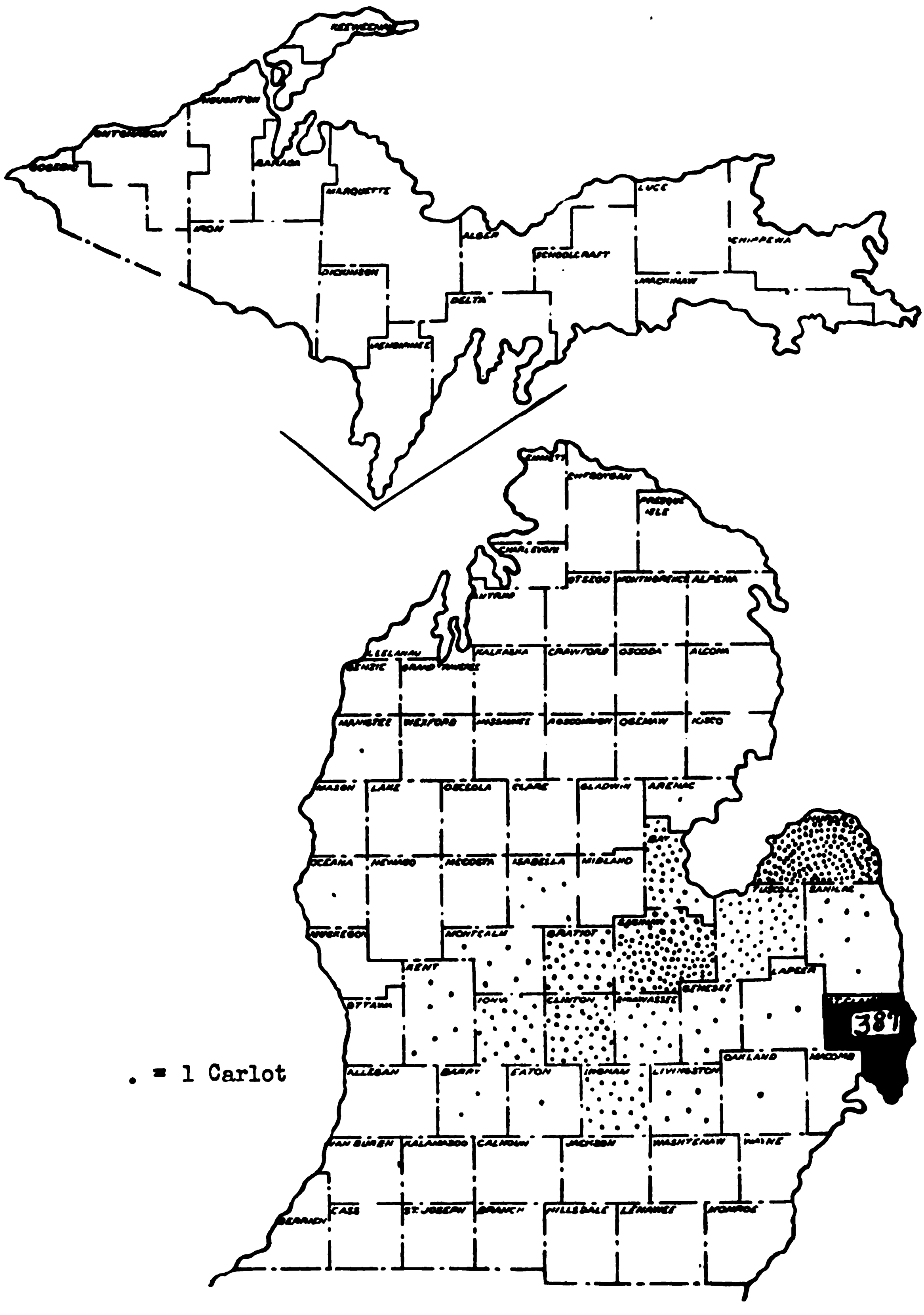


Figure 4. - Sources of Carlot Shipments, 1937-38

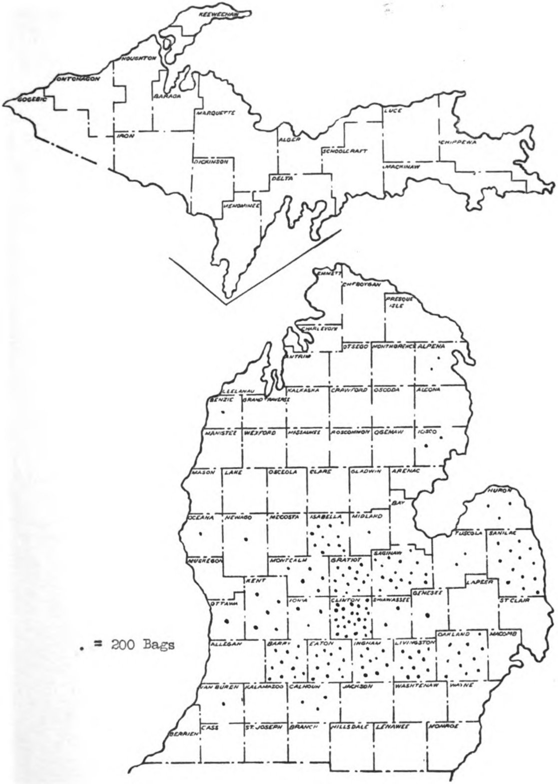


Figure 5. - Sources of Truck Shipments, 1932-33

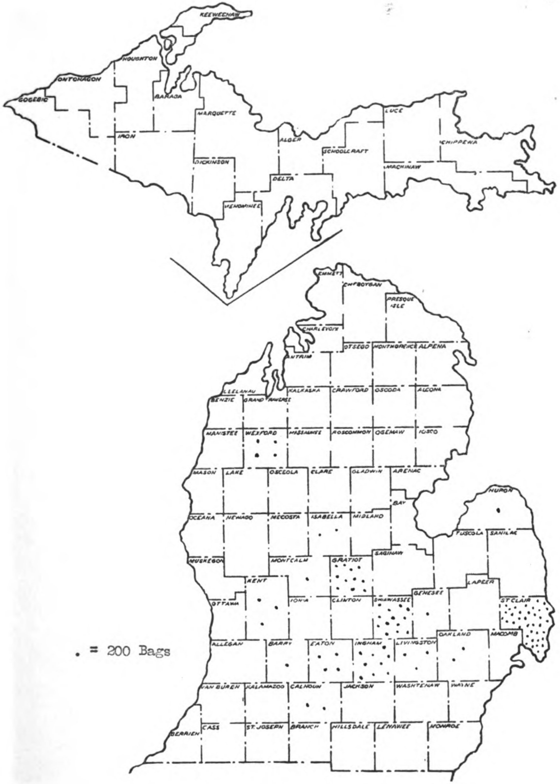


Figure 6. - Sources of Truck Shipments, 1936-37

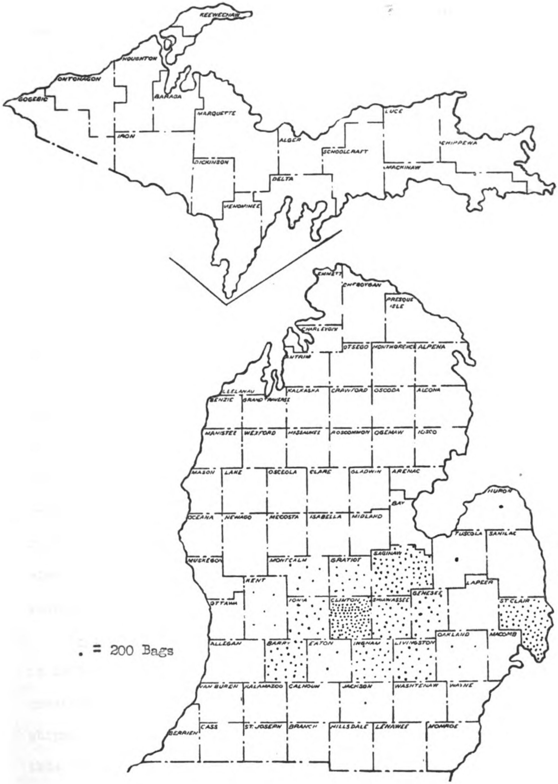


Figure 7. - Sources of Truck Shipments, 1937-38

large crop of 1932-33 resulted in more truck shipments than in 1936-37. The points of origin of the truck shipments were widely distributed over the whole bean producing area in the 1932 season, whereas in the 1936 and 1937 seasons there was a tendency toward the restriction of the sources of truck shipments to more definite areas. There was a great increase in the number of truck shipments in the crop year of 1937 although they were largely concentrated in the south-central part of the bean producing region. A large part of the truck shipments in 1937 originated in the border counties of the bean producing area, namely, Barry, Ingham, Livingston, Clinton, Shiawassee and Genessee counties. Saginaw county, although lying in the center of the bean producing region, was also the source of a large number of truck shipments. It appears that truck shipments of beans are of primary importance in the border counties, but there is a tendency for the penetration of this method of shipment into the heart of the bean region. The quantities of beans sold to and by the local elevators in the border counties are considerably less than those handled by elevators in the heart of the bean production area; consequently, holding for carlot accumulations involves greater risks from price changes. The usual 200 bag truck load allows a more rapid turnover of bean stocks than the regular 500 bag carload. Local elevator managers who observe this method of reducing risks will be making increased truck shipments.

Less-carlot Shipments. The sources of less-carlot shipments of beans in 1932-33, 1936-37 and 1937-38 are presented in Figures 8, 9 and 10. A great number of l.c.l. shipments were made in 1932-33. These less-carlot shipments vary in size from 5 to 200 bags, usually less than 100 bags, and thus constitute only a small portion of the crop moved. The points of origin of l.c.l. shipments in 1932-33 were well distributed throughout the

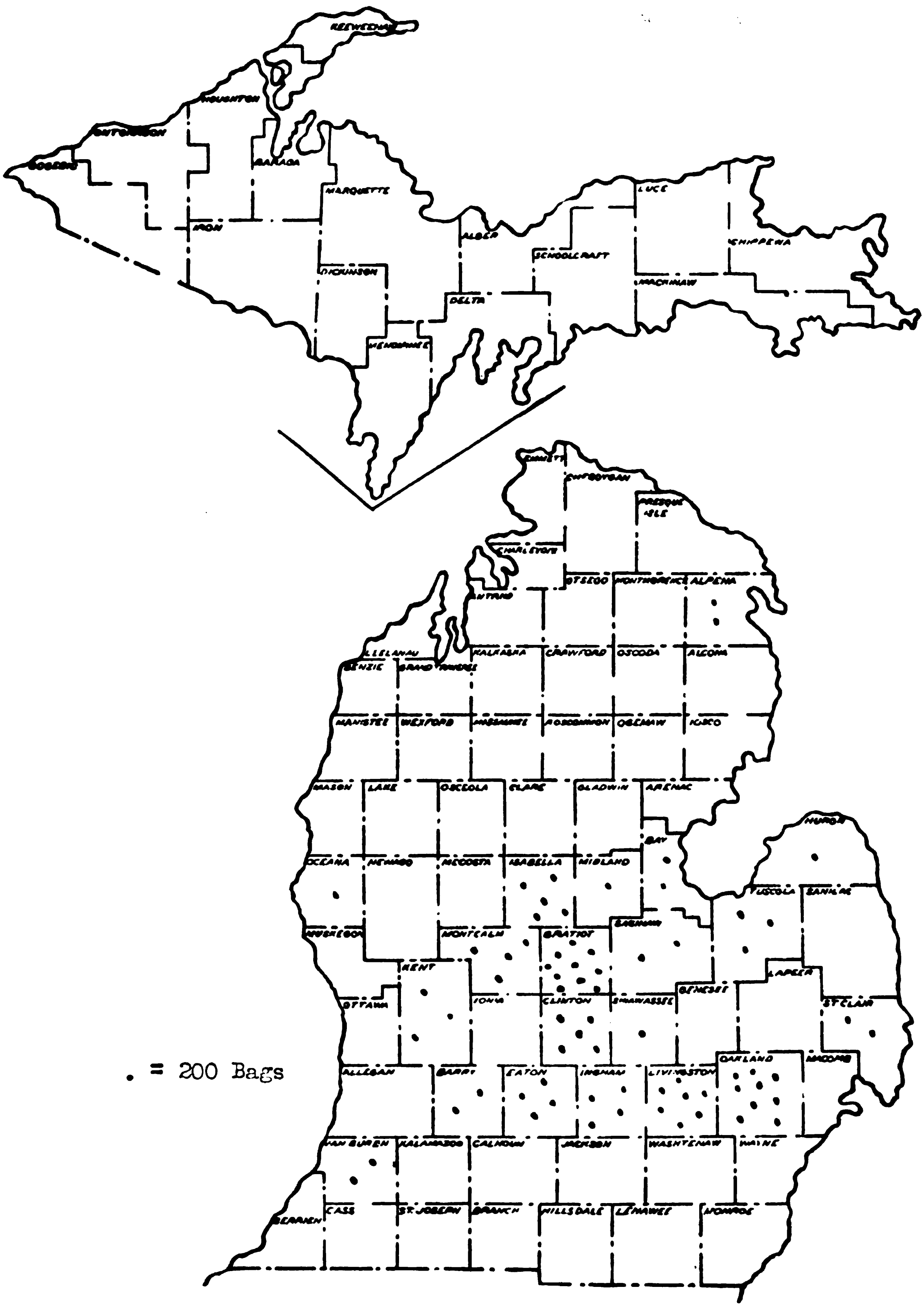
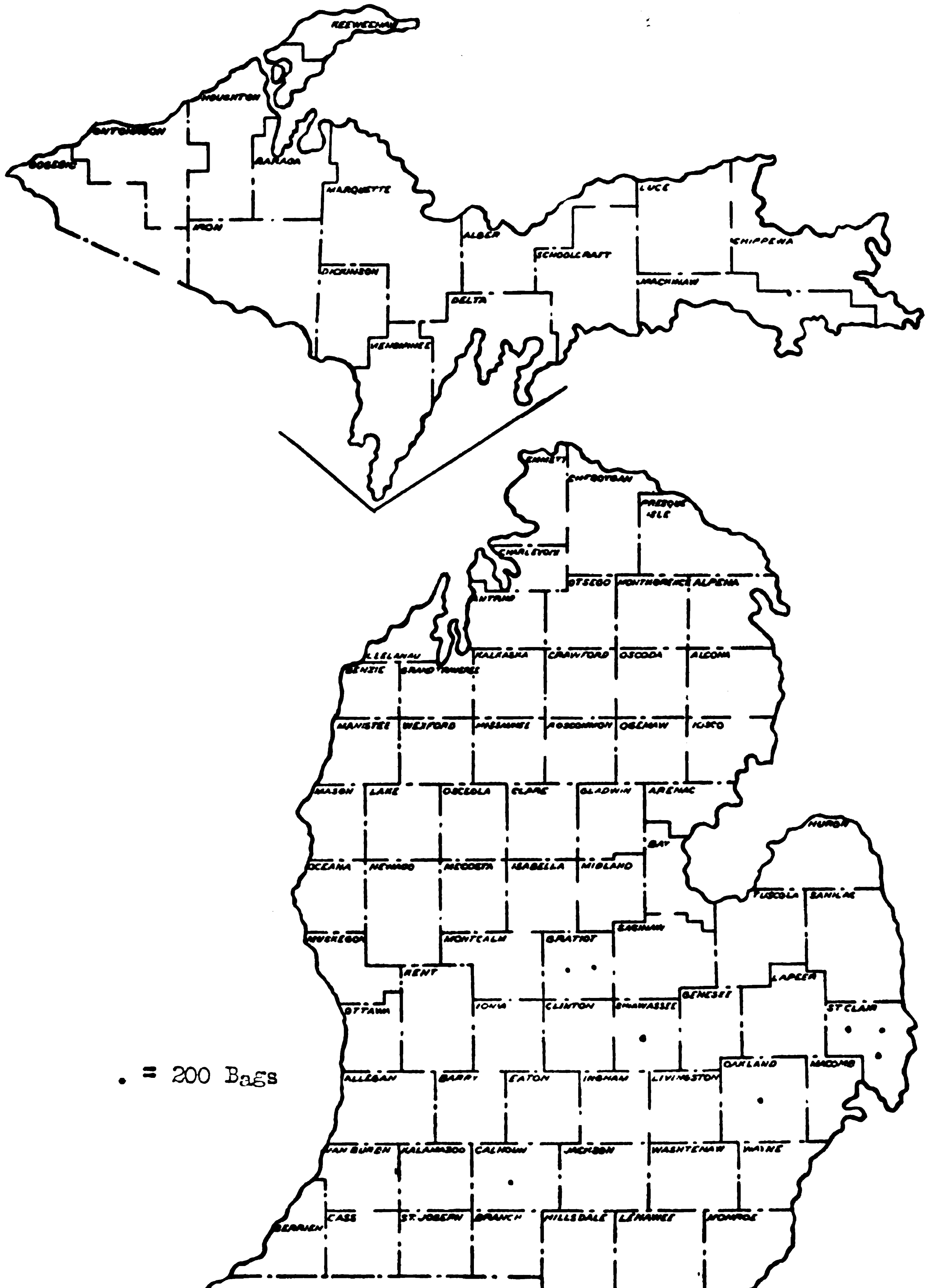


Figure 8. - Sources of Less-carlot Shipments, 1932-33



. = 200 Bags

Figure 9. - Sources of Less-carlot Shipments, 1936-37

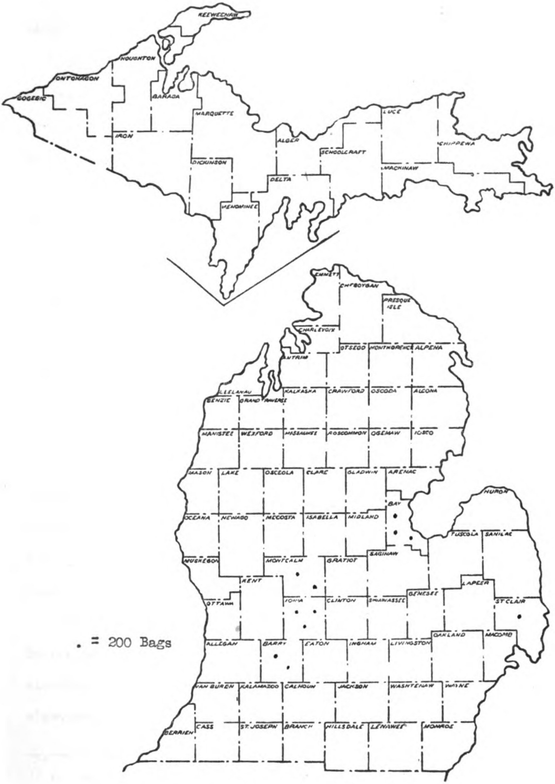


Figure 10. - Sources of Less-carlot Shipments, 1937-38

bean producing area. There were very few less-carlot shipments in the 1936 and 1937 seasons since members of the trade who formerly used the l.c.l. method of sale are now employing trucks for such shipments.

Summary of Carlot, Truck and L.C.L. Shipments. Carlot shipments originate over the entire bean producing region, the concentration in certain areas depending upon the size and quality of the crop. Truck shipments originate largely in the border counties of the bean producing area but with a tendency to gradually extend over the whole region. Less-carlot shipments are becoming a thing of the past as truck transportation has practically replaced this type of shipment.

Seasonal Distribution of Shipments from Terminal Plant and Local Elevators

Total Shipments from Terminal Plant and Local Elevators. The graph at the top of the page in Figure 11 (Table 4, Appendix)[1] indicates the seasonal distribution of the total shipments of beans from the terminal plant and the local elevators for the seasons of 1932, 1936 and 1937. In each of the three selected crop years the heaviest movement occurred during the first three months of the season. The monthly movement becomes more regular though smaller during the remainder of the crop year. The poor quality 1936 crop necessitated the processing of a large proportion of Michigan beans and resulted in a more irregular monthly movement.

The chart below the graph in Figure 11 shows the comparative distribution of total shipments from the terminal plant and from the local elevators. The proportion of shipments from the terminal plant and local elevators varies from year to year. During the 1932 crop year nearly

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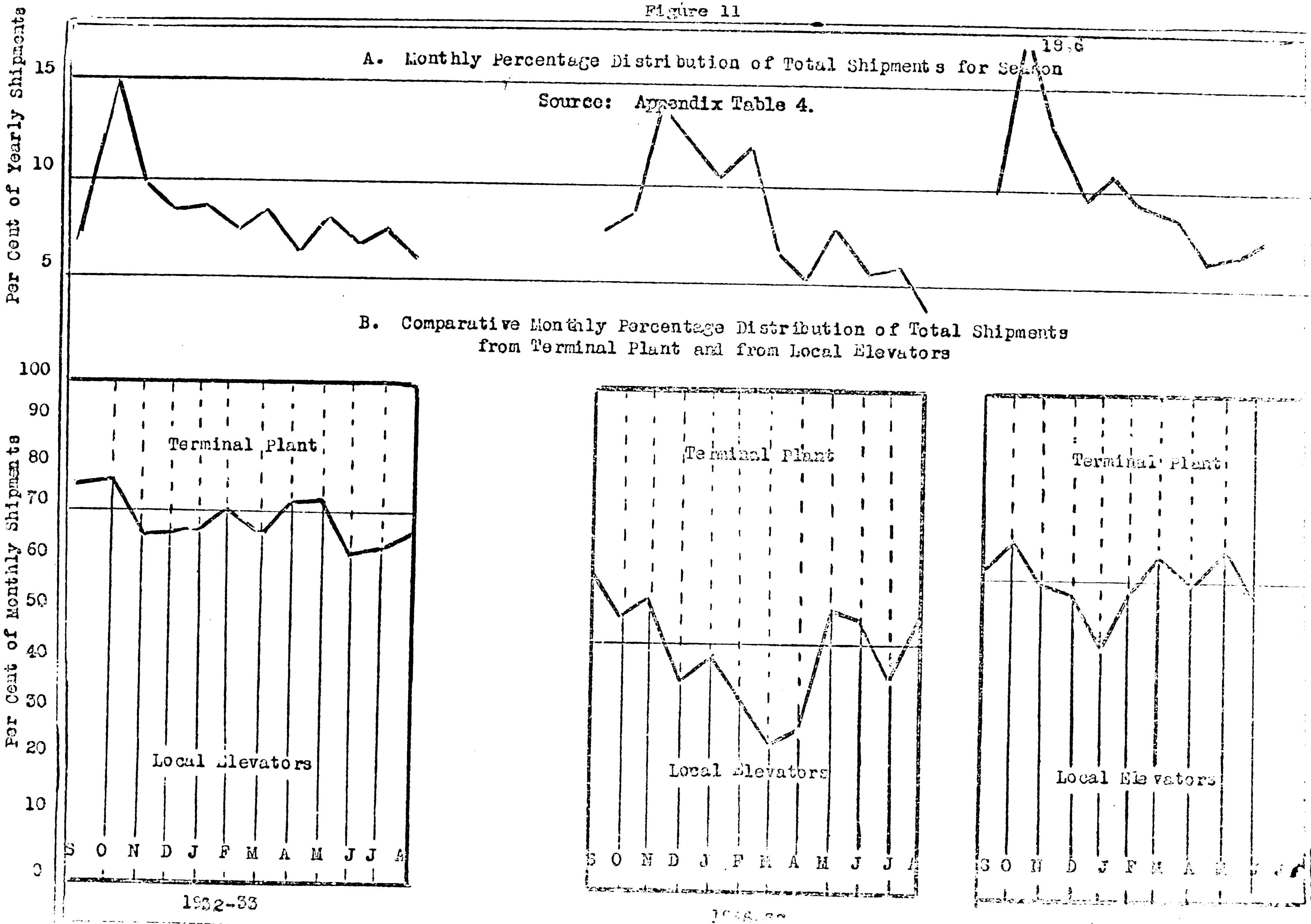
1. To avoid a cumbersome presentation of data a number of tables are placed in the Appendix rather than in the body of the text.

Figure 11

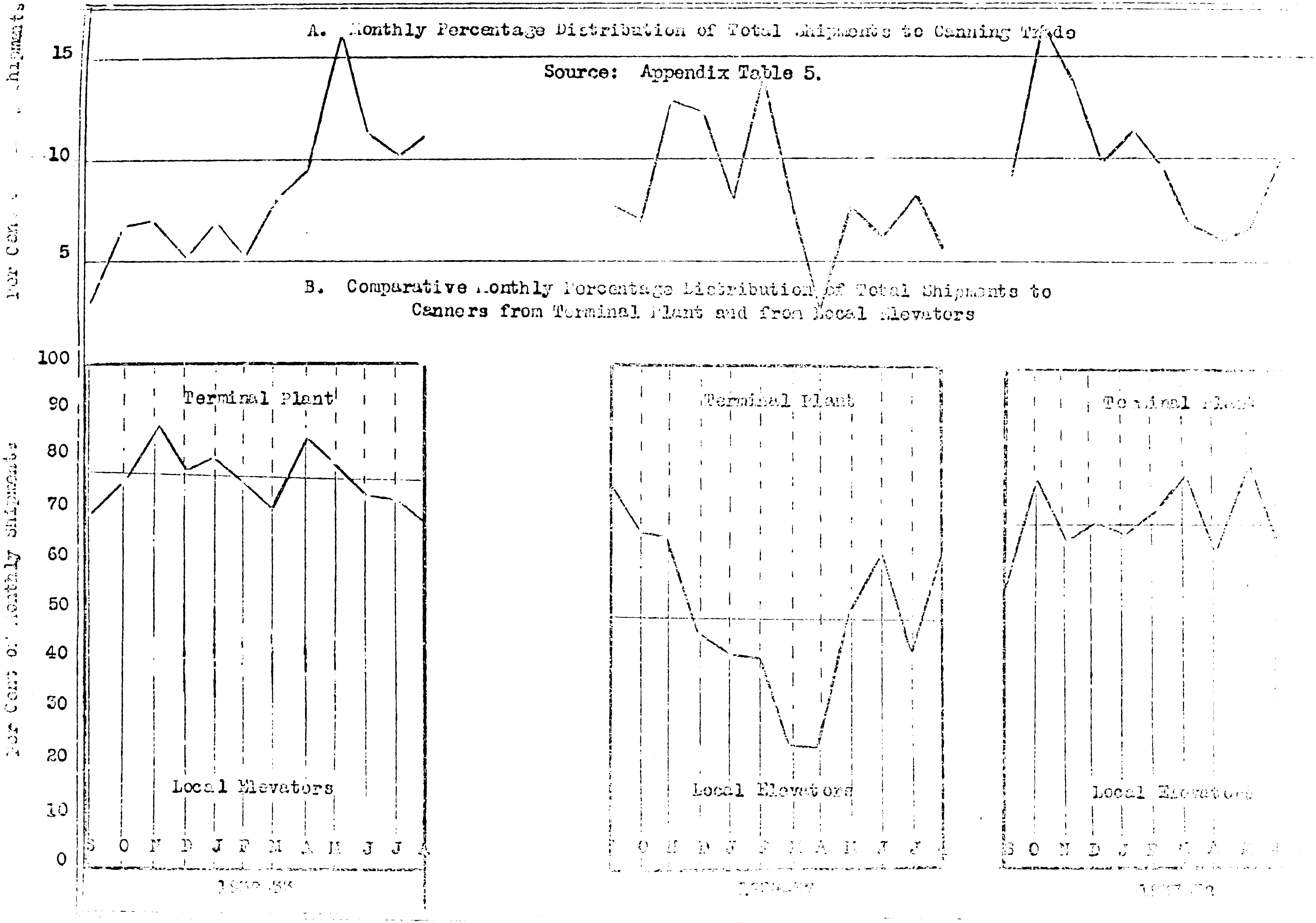

A. Monthly Percentage Distribution of Total Shipments for Season
Source: Appendix Table 4.
19.6
Per Cent of Yearly Shipments
15
10
5
B. Comparative Monthly Percentage Distribution of Total Shipments from Terminal Plant and from Local Elevators
Per Cent of Monthly Shipments
100
90
80
70
60
50
40
30
20
10
0
Terminal Plant
Local Elevators
S O N D J F M A M J J A
1932-33

three-fourths of the total shipments were from the local elevators and only one-fourth from the terminal plant. As the average pick for this year was only 3.5 per cent it would be expected that a larger proportion of the beans could be shipped from the local elevators since less processing would be necessary. In 1936-37 the proportion of beans shipped from the terminal plant was 52 per cent while that shipped direct to the trade from the local elevators amounted to 48 per cent. Wet weather conditions at harvest time which resulted in a 10 per cent average pick that year necessitated the processing of a larger proportion of the crop. The 1937-38 crop was of high quality with an average pick of three per cent, and consequently nearly 62 per cent moved direct to the trade from the local elevators.

Total Shipments to Canning Trade from Terminal and Local Elevators. The seasonal distribution of total shipments of beans to the canning trade for the three selected crop years is shown in the graph in Figure 12 (Table 5, Appendix). The monthly movement to canners in 1932-33 was heaviest during the last few months of the crop year, quite irregular throughout the 1936-37 season and very heavy during the first few months of the 1937-38 crop year. In each of the three years the canners secured their heaviest shipments during different periods of the marketing season. Most canners follow the policy of concentrating their purchases of beans when they consider the price most favorable. Their freedom in this respect is enhanced, as the storing qualities of the pea bean permit the canning of this product during the "off season" for fruits and vegetables.

The chart in Figure 12 shows the comparative importance of terminal plant and local elevator shipments to the canning trade for the three selected years. The canners secured 23 per cent of their beans from the

Figure 12

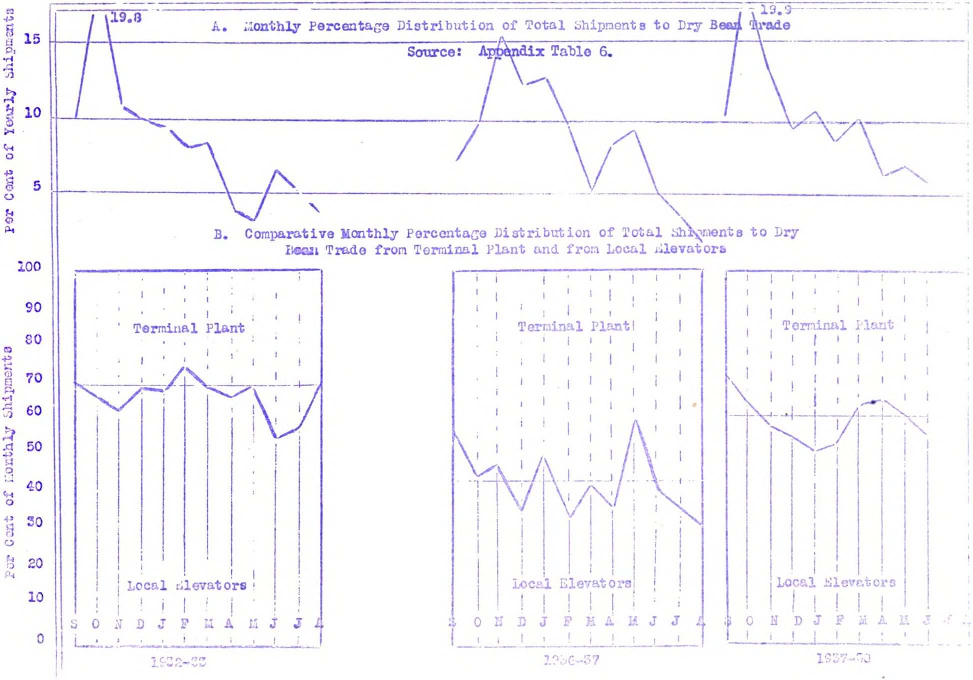

A. Monthly Percentage Distribution of Total Shipments to Canning Trade
Source: Appendix Table 5.
B. Comparative Monthly Percentage Distribution of Total Shipments to Canners from Terminal Plant and from Local Elevators
15
10
5
100
90
80
70
60
50
40
30
20
10
0
Terminal Plant
Local Elevators
S O N D J F M A M J J A

terminal plant during the season of 1932 compared with 49 per cent in 1936 and 32 per cent in 1937. Thus with a poor quality crop, as in 1936-37, the canners demand a more uniform quality of processed beans. With the better quality crop in 1937 the canners again secured a larger proportion of their beans direct from the local elevators, but over the six year period there appears to be an upward trend in purchases of processed beans from the terminal elevator by the canning trade.

Total Shipments to Dry Bean Trade from Terminal Plant and Local Elevators. The graph in Figure 13 (Table 6, Appendix) shows the seasonal distribution of total shipments to the dry bean trade for the seasons of 1932, 1936 and 1937. In each of the three crop years the heaviest movement to the dry bean trade occurred during the early months of the season with a relatively light movement during the remainder of the crop year. Despite the poor quality crop in 1936 the dry bean trade secured the bulk of their shipments during the early part of the crop year. As the demand for beans by the canning trade is relatively inelastic, Michigan bean jobbers tend to push sales to the dry bean trade during the fall months which is the period of heavy deliveries to the local elevators.

The comparative monthly movement from the terminal plant and from the local elevators to the dry bean trade for the three years is shown in Figure 13. During the crop year of 1932-33 approximately 30 per cent of the shipments to the dry bean trade were from the terminal plant compared with nearly 60 per cent in 1936-37. The dry bean trade demanded more terminal plant shipments in 1936-37 to secure a more uniform quality product. The high quality crop of 1937-38 resulted in the dry bean trade securing nearly 60 per cent of their beans direct from the local elevators. Thus the relative importance of the terminal plant and local elevator

Figure 13


A. Monthly Percentage Distribution of Total Shipments to Dry Bean Trade
Source: Appendix Table 6.
19.8
19.9
Per Cent of Yearly Shipments
15
10
5
B. Comparative Monthly Percentage Distribution of Total Shipments to Dry Bean Trade from Terminal Plant and from Local Elevators
Per Cent of Monthly Shipments
100
90
80
70
60
50
40
30
20
10
0
Terminal Plant
Local Elevators
S O N D J F M A M J J A
1932-33
Terminal Plant
Local Elevators
S O N D J F M A M J J A
1936-37
Terminal Plant
Local Elevators
S O N D J F M A M J
1937-38

shipments to the dry bean trade varies with the quality of the crop.

Carlot Shipments from Terminal Plant and Local Elevators. The graph in Figure 14 (Table 7, Appendix) indicates the seasonal distribution of carlot shipments from the terminal plant and from the local elevators for the seasons of 1932, 1936 and 1937. In the crop years of 1932-33 and 1937-38 the heaviest monthly movement occurred during the fall with a less variable movement during the remainder of the year. During the 1936-37 crop year the monthly carlot movement was quite irregular throughout the season, although the heavier shipments were made during the first half of the year.

The chart in Figure 14 shows the comparative distribution of carlot shipments from the terminal plant and from the local elevators for the three selected crop years. Approximately 29 per cent of the total carlot shipments were from the terminal plant in 1932-33 compared with 53 per cent in 1936-37. The larger proportion of carlot shipments from the terminal elevator in 1936-37 was largely due to the poor quality crop with a resulting demand for a greater proportion of processed beans. Approximately two-fifths of the carlot shipments were from the terminal plant in 1937-38. There is an upward trend in the proportion of carlot shipments from the terminal plant.

Truck Shipments from Terminal Plant and Local Elevators. The seasonal distribution of truck shipments for the seasons of 1932, 1936 and 1937 is shown by the graph in Figure 15 (Table 8, Appendix). As indicated by the graph the seasonal movement of truck shipments was very irregular during each of the three years. Regardless of the quality or the size of the crop, truck shipments of beans move to market intermittently during the crop year.

Figure 14

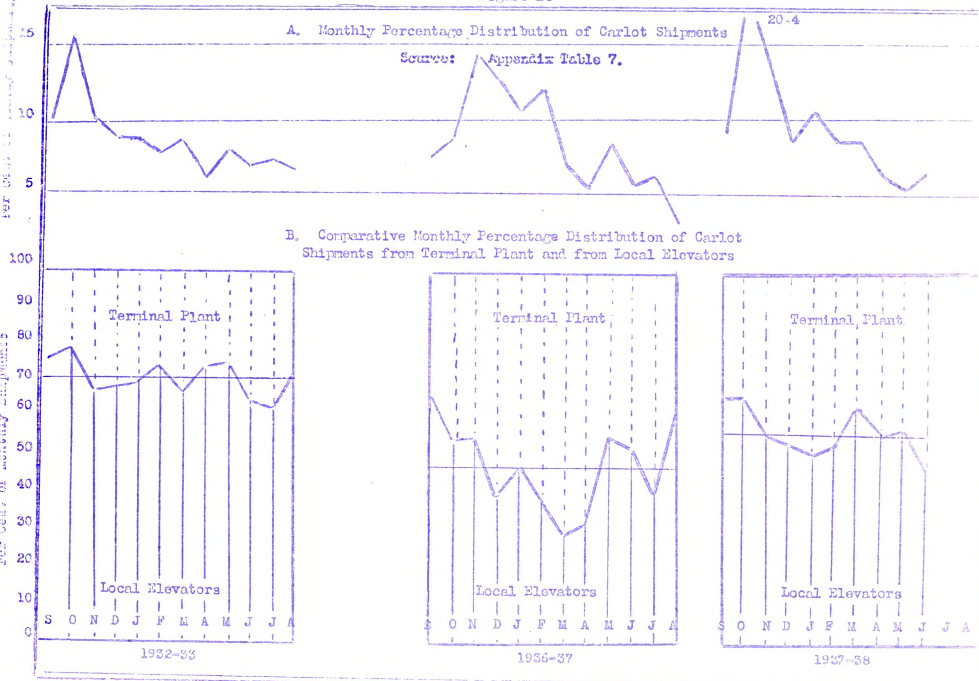
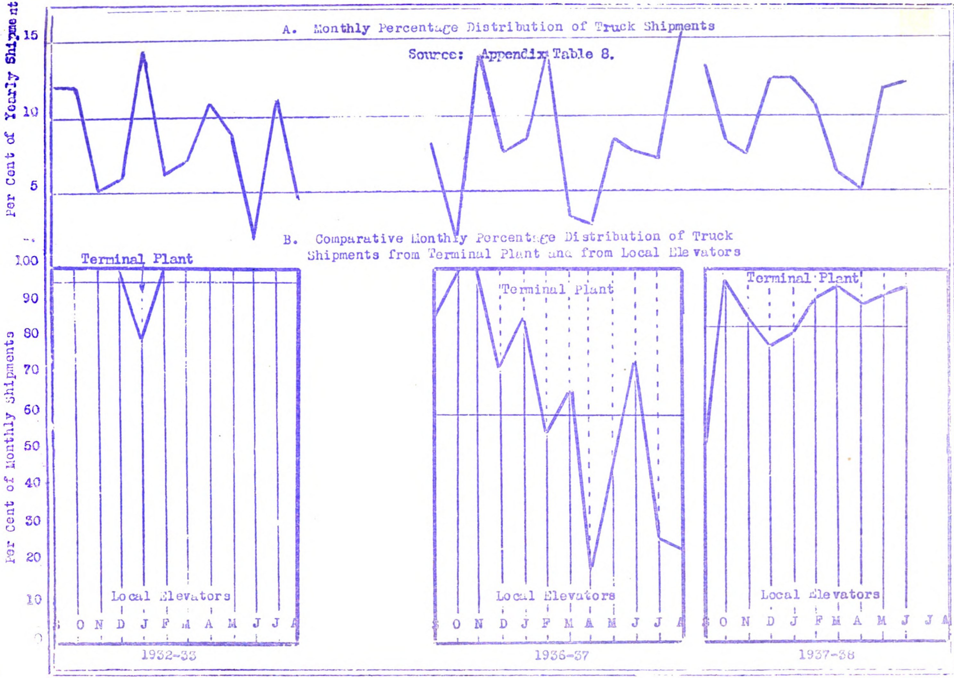

A. Monthly Percentage Distribution of Carlot Shipments
Source: Appendix Table 7.
20.4
15
10
5
B. Comparative Monthly Percentage Distribution of Carlot Shipments from Terminal Plant and from Local Elevators
100
90
80
70
60
50
40
30
20
10
0
Terminal Plant
Local Elevators
S O N D J F M A M J J A
1932-33
1936-37
1937-38

Figure 15


A. Monthly Percentage Distribution of Truck Shipments
Source: Appendix Table 8.
Per Cent of Yearly Shipments
15
10
5
B. Comparative Monthly Percentage Distribution of Truck Shipments from Terminal Plant and from Local Elevators
Per Cent of Monthly Shipments
100
90
80
70
60
50
40
30
20
10
0
Terminal Plant
Local Elevators
S O N D J F M A M J J A
1932-33
1936-37
1937-38

The chart in Figure 15 indicates the comparative distribution of truck shipments from the terminal plant and from local elevators to the canning and dry bean trade for the three selected crop years. There were practically no truck shipments from the terminal plant in 1932; 97 per cent of such truck shipments during the year were from the local elevators. But during the 1936-37 season approximately 38 per cent of the truck shipments were from the terminal plant. The canners and members of the dry bean trade who were using the truck as a method of transportation found it necessary to obtain their beans from the terminal plant rather than from local elevators in order to secure the desired quality. In 1937-38 with a higher quality crop only 16 per cent of the truck shipments were from the terminal plant. Although truck shipments from the terminal elevator tend to vary with the quality of the crop, it appears that the volume of such truck shipments is tending to increase.

Summary of Shipments Through Terminal Elevator and from Local Elevators to the Canning and Dry Bean Trade. The dry bean trade apparently purchases the bulk of its shipments during the early months of the crop year; whereas the canners follow no consistent policy in respect to the period of purchasing the larger portion of their shipments. The comparative importance of the terminal plant and local elevator shipments to either the canners or dry bean trade varies with the quality of the crop; that is, a poor quality crop requires more processing at terminal elevators with resulting heavier shipments to both the canning and dry bean trade. The general trend indicates that an increasing proportion of the shipments moves from the terminal plant. The proportion of the total carlot shipments from the terminal plant is increasing. The relative importance of truck shipments from the terminal elevator and from the local elevators varies with the quality of the crop. The greater bulk of the truck shipments are from the local elevators, although there is a tendency for an increasing number of truck shipments from the terminal plant.

Transportation Methods in Relation to Destination and Distribution between Canning and Dry Bean Trade

As Michigan normally produces over 80 per cent of the white pea beans grown in the United States, one would expect a nation-wide distribution of this product. The bulk of the Michigan crop, however, is marketed in the New England, Middle Atlantic and North Central states. A relatively small portion of Michigan beans is shipped west of the Mississippi due to the restrictive factors of higher freight rates and competing varieties in that area. Few Michigan beans are shipped to the southern states, as the Pinto and Great Northern varieties are used largely in that area to supply the demands of the dry bean trade.

It is generally estimated by members of the trade that about 60 per cent of the Michigan production goes to the dry bean trade and 40 per cent to the canners. It will be shown later that this ratio varies considerably with the quality and the size of the crop, market prices and the merchandising policies followed by the canning and dry bean trade.

In this section of the study a comparison is made of the destinations of carlot, truck and less-carlot shipments. In the maps accompanying this discussion the dots representing individual shipments to each state have been distributed about the principal markets rather than uniformly over the territory of each state in order to indicate more accurately the concentration points of these destinations. It is beyond the scope of this study to follow the redistribution of these shipments from the canners or whole-

sale distributors of dry beans.

Destinations of Carlot and Truck Shipments and Distribution between the Canning and Dry Bean Trade.

Carlot Shipments. The distribution of carlot shipments of beans for the crop years of 1932, 1936 and 1937 are shown in Figures 16, 17 and 18. During the 1932-33 season there was a wide distribution of carlot shipments due to the extraordinarily large crop produced in Michigan that year. A considerable number of carloads were shipped west of the Mississippi as well as into the southern states. Fewer carloads were shipped in 1936-37 due to the smaller production and poor quality causing a considerable restriction in the area in which carlot shipments were distributed. Thus a large crop usually results in a wider distribution of Michigan beans, depending upon the production and price of competing varieties, and a small crop results in a restriction of the area in which they are distributed to either the canneries or the large wholesalers of dry beans in the principal markets.

Although approximately the same number of carloads were shipped in 1937-38 as in 1936-37, only half as many carloads were shipped to the states of Illinois and Indiana during the latter year. The purchasing policies followed by three or four large canning companies in these states largely effected this situation. Offsetting this decrease in shipments to the above states in 1937-38, a marked increase occurred for the states of Kentucky, Tennessee, Virginia and West Virginia. The larger and better quality crop of 1937 resulted in increased purchases by the dry bean trade. Thus a small crop of poor quality results in decreased sales to the dry bean trade, and conversely, a large crop of high quality results in increased sales to the dry bean trade.

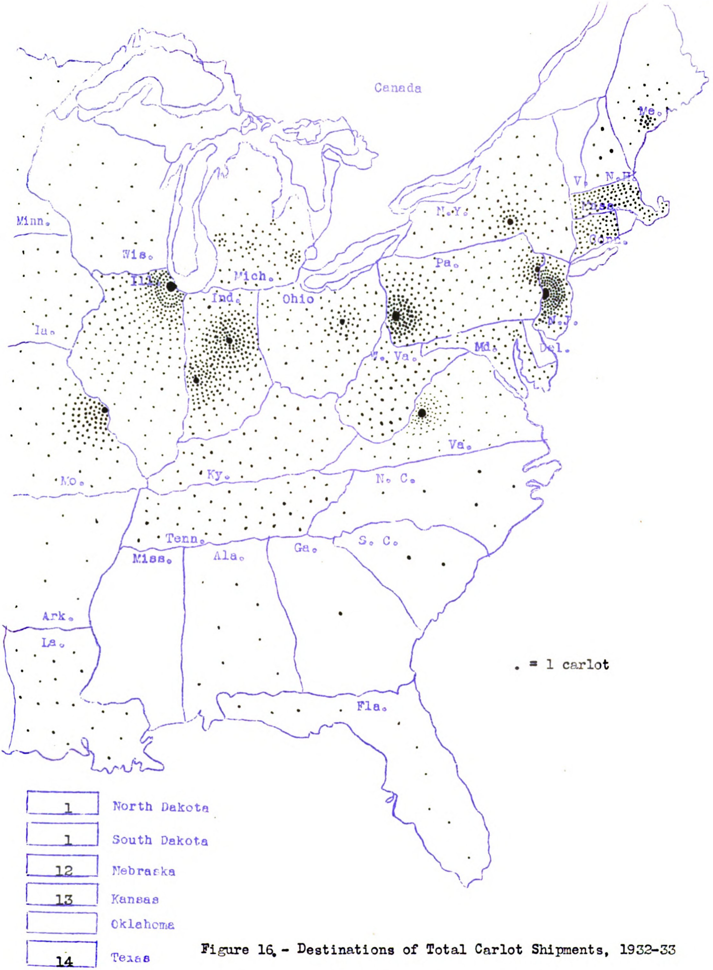


Figure 16. - Destinations of Total Carlot Shipments, 1932-33

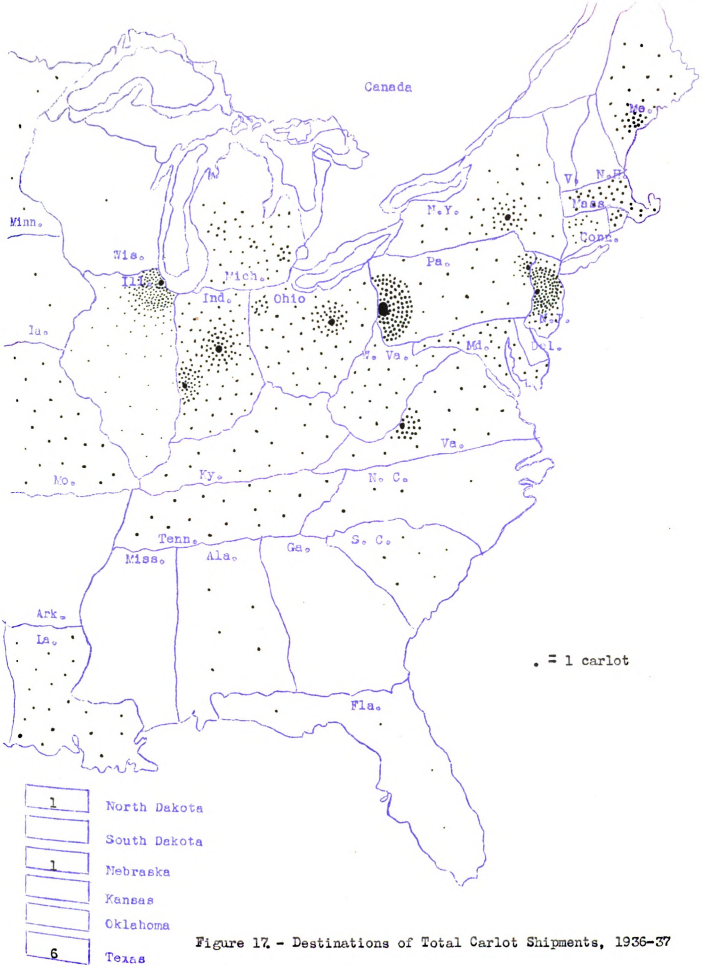
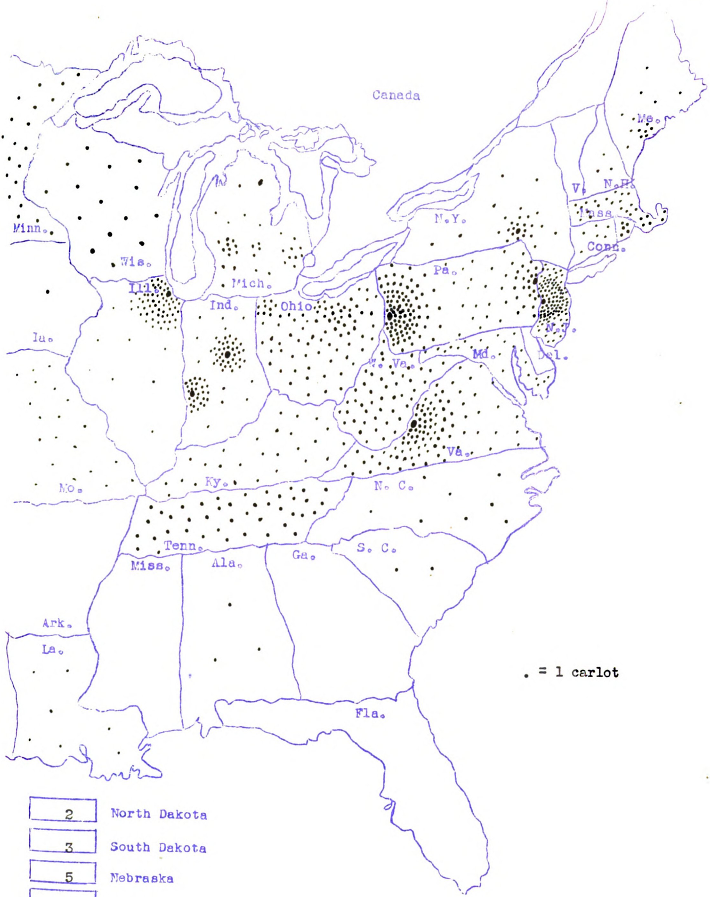


Figure 17. - Destinations of Total Carlot Shipments, 1936-37



2	North Dakota
3	South Dakota
5	Nebraska
1	Kansas
	Oklahoma
4	Texas

Figure 18. - Destinations of Total Carlot Shipments, 1937-38

The graph in Figure 19 (Table 9, Appendix) shows the monthly distribution of carlot shipments for the crop years 1932, 1936 and 1937.*

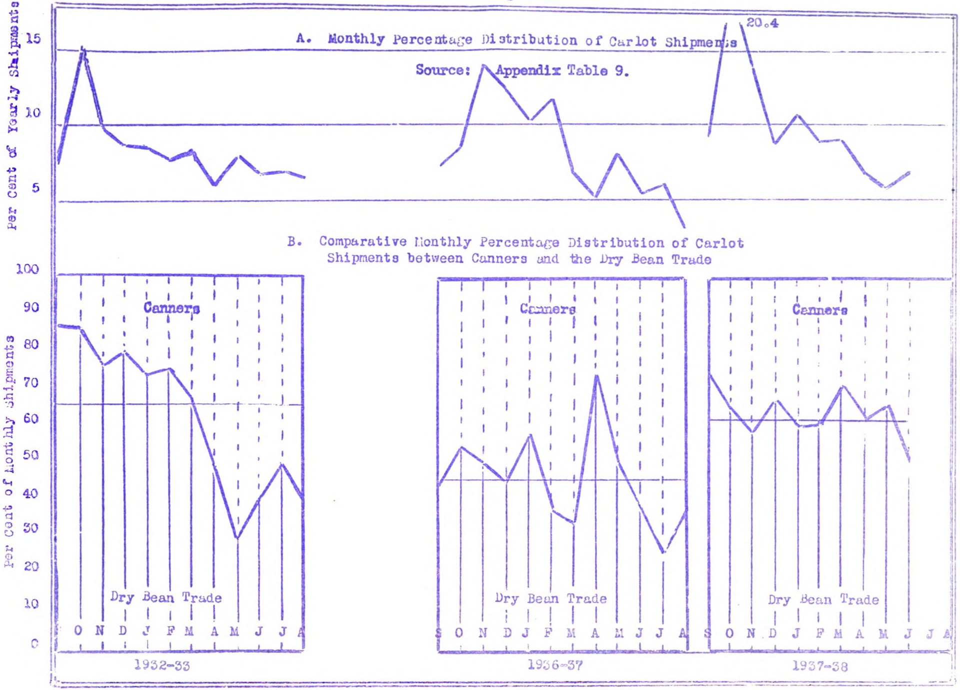
The comparative distribution of carlot shipments between the canner and dry bean trade for the three selected seasons is shown by the chart in Figure 19. The dry bean trade secured the greater proportion of the carlot shipments during the early months of the 1932-33 crop year while the canning trade took the greater proportion during the latter months. During the 1936 and 1937 seasons the distribution of carlot shipments between the canning and dry bean trade was less variable throughout the seasons.

The proportion of the carlot shipments going to the canning trade in 1932-33 was approximately 33 per cent compared with 54 per cent in 1936-37 and 39 per cent in 1937-38. With the small crop of 1936, the canners secured the greater proportion of carlot shipments as their demand for navy beans is relatively inelastic. Thus the proportion of the Michigan bean crop taken by the canners varies directly with the size of the crop. A large crop results in a smaller proportion of the crop being taken by the canners and a larger proportion by the dry bean trade.

Truck Shipments. Figures 20, 21 and 22 indicate the destinations of truck shipments for the 1932, 1936 and 1937 seasons. The destinations of truck shipments are rather restricted to the states adjoining Michigan. The destinations of the greater number of the truck shipments in 1932 and 1936 were in Indiana, Ohio, Michigan, Illinois and Iowa. More beans were shipped by truck in 1932 than in 1936 but not in proportion to the total crop movement. The tonnage of truck shipments in 1937 more than quadrupled that of the preceding crop year. Again in 1937 as in 1932 and 1936, the

*This graph was previously presented in Figure 14, but is again shown here in order to avoid an inaccurate interpretation of the chart in Figure 19.

Figure 19


A. Monthly Percentage Distribution of Carlot Shipments
Source: Appendix Table 9.
20.4
Per Cent of Yearly Shipments
15
10
5
B. Comparative Monthly Percentage Distribution of Carlot Shipments between Canners and the Dry Bean Trade
Per Cent of Monthly Shipments
100
90
80
70
60
50
40
30
20
10
0
Canners
Dry Bean Trade
S O N D J F M A M J J A
1932-33
1936-37
1937-38

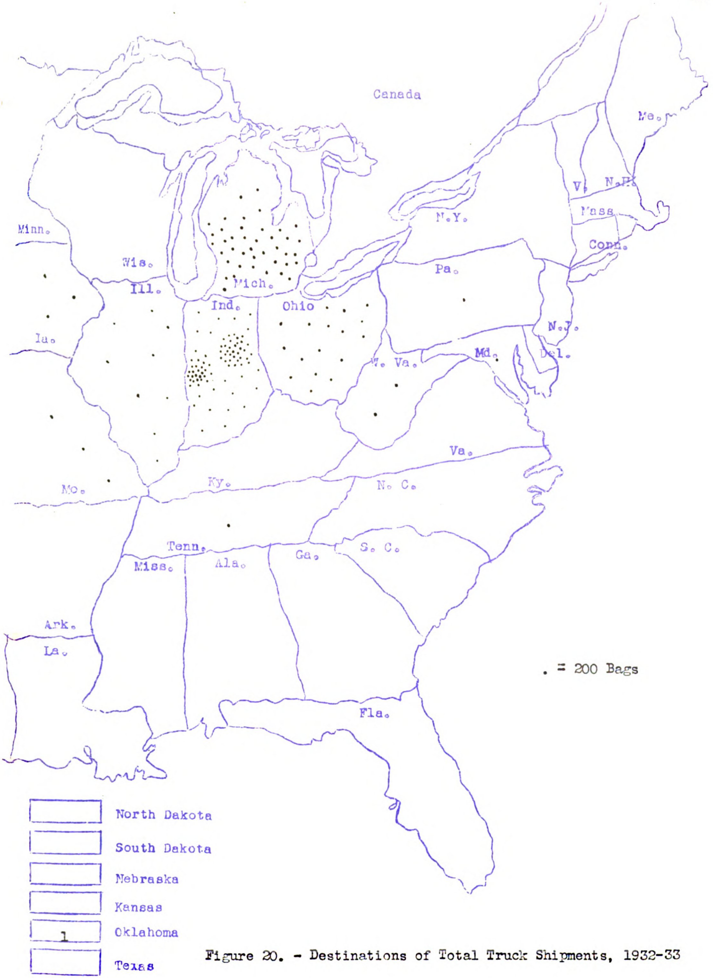


Figure 20. - Destinations of Total Truck Shipments, 1932-33

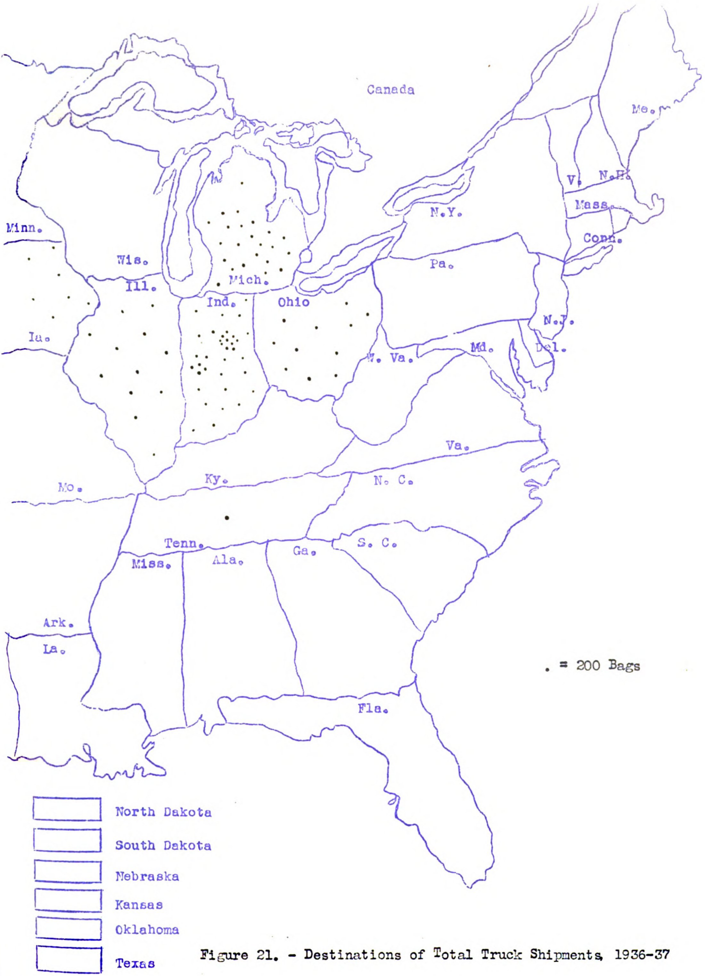


Figure 21. - Destinations of Total Truck Shipments, 1936-37

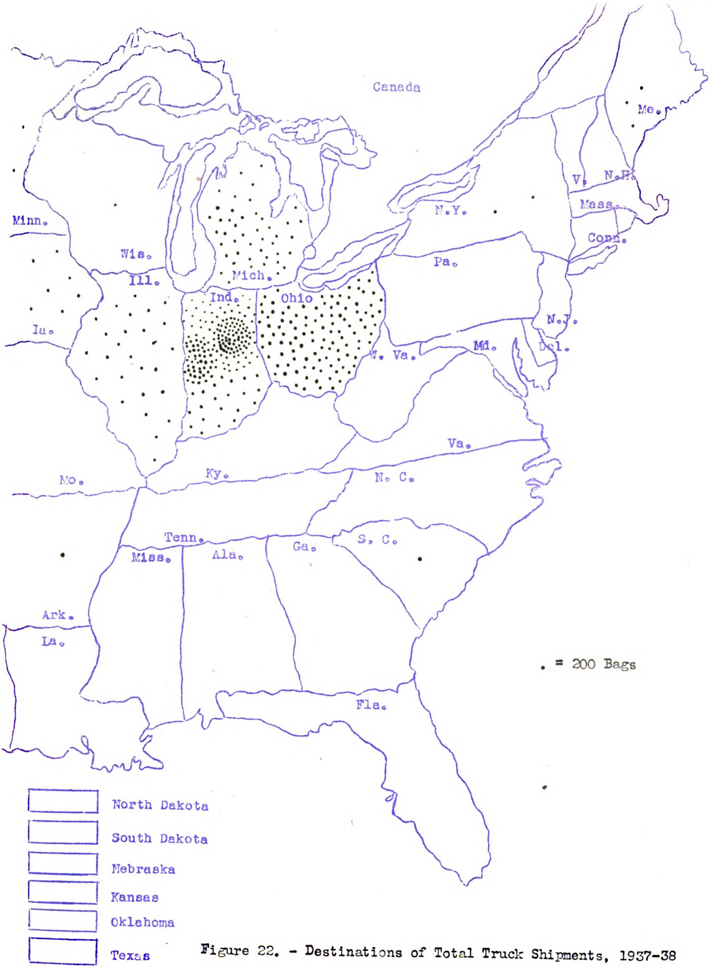


Figure 22. - Destinations of Total Truck Shipments, 1937-38

destinations of truck shipments were in Indiana, Ohio, Michigan, Illinois and Iowa. A few truck loads were received in the states of Maine, New York, South Carolina, Arkansas, Wisconsin and Minnesota. Whether or not there is a definite trend toward longer hauls by truck is difficult to determine from the indication of one year. The great increase in truck shipments of beans does indicate, however, that there is an upward trend in the use of truck transportation for Michigan beans.

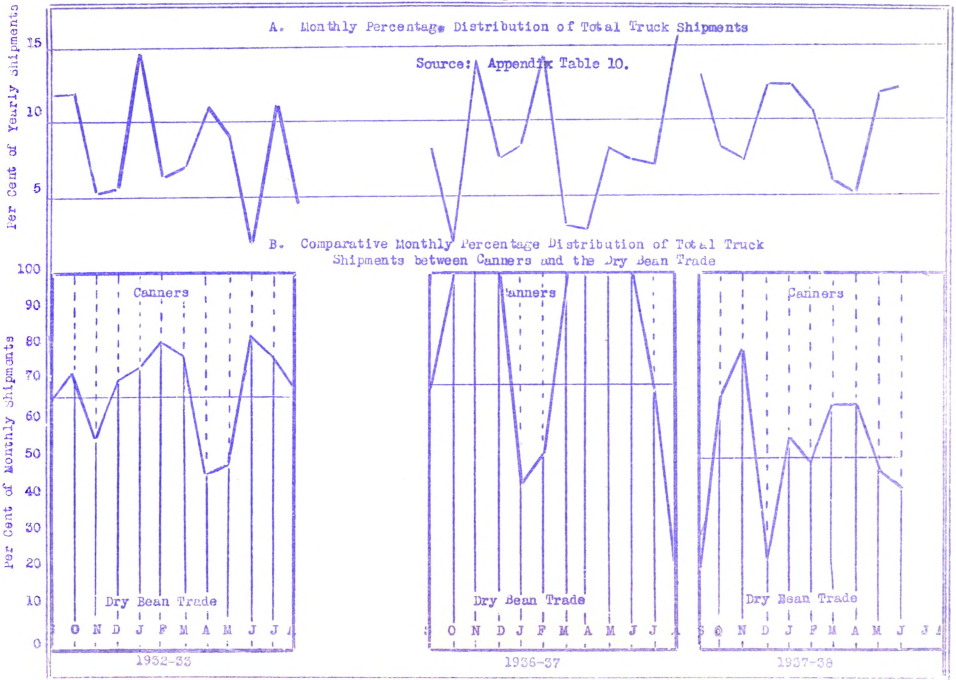
The graph in Figure 23 shows the monthly distribution of truck shipments of beans for the three selected crop years.*

The comparative distribution of truck shipments between canners and the dry bean trade for the crop years of 1932, 1936 and 1937 is shown by the chart in Figure 23. In the 1932 season 33 per cent of the truck shipments were taken by the canners compared with 30 per cent in 1936-37 and 52 per cent in 1937-38. It is significant that of the marked increase in truck shipments in 1937 the greater proportion went to the canning trade. The seasonal distribution of truck shipments between the canning and dry bean trade is very irregular. In some months the canners may take the greater proportion of the truck shipments, while in other months the dry bean trade takes the larger proportion. In each of seven months in the 1936 crop year all of the truck shipments were to the dry bean trade. The proportion of the total truck shipments taken by either the canners or members of the dry bean trade is largely dependent upon the purchasing practices employed by the two respective groups.

<u>Comparison of Carlot and Truck Shipments</u>. Carlot shipments of Michigan beans are widely distributed over the eastern half of the United States,

*This graph was previously presented in Figure 15 but is again shown here to avoid an inaccurate interpretation of the chart in Figure 23.

Figure 23


A. Monthly Percentage Distribution of Total Truck Shipments
Source: Appendix Table 10.
Per Cent of Yearly Shipments
15
10
5
B. Comparative Monthly Percentage Distribution of Total Truck Shipments between Canners and the Dry Bean Trade
Per Cent of Monthly Shipments
100
90
80
70
60
50
40
30
20
10
0
Canners
Dry Bean Trade
S O N D J F M A M J J A
1932-33
1936-37
1937-38

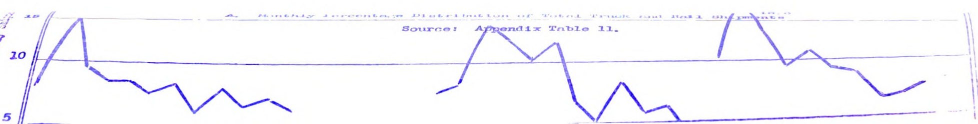
while truck shipments are restricted chiefly to the states adjoining Michigan. Distance appears to be the chief limiting factor in restricting the area in which truck shipments are distributed. Rail shipments, although generally well distributed throughout the eastern half of the United States, are somewhat limited to the south by higher freight rates and competition of the Pinto variety. West of the Mississippi River higher costs of transportation and competition of western varieties constitute the chief factors in limiting carlot shipments into this area.

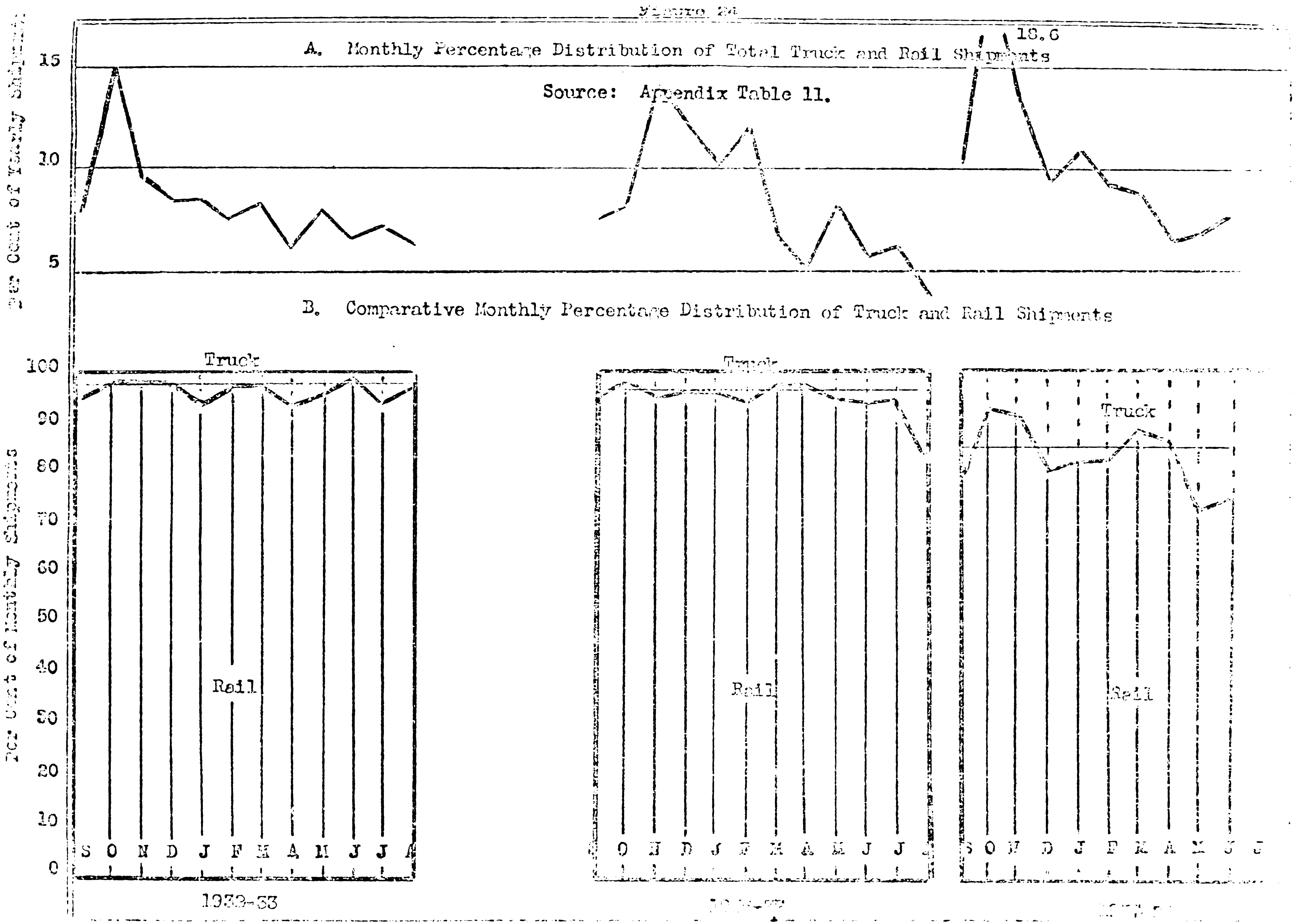
The territory reached by truck shipments is bordered on the east and southeast by the Appalachian Mountains, on the south the movement is limited by distance and competition of the Pinto variety and on the west by higher transportation costs and the competition of western varieties.

The graph in Figure 24 (Table 11, Appendix) indicates the monthly distribution of total rail and truck shipments for the three selected crop years.*

The comparative monthly distribution of rail and truck shipments for the seasons of 1932, 1936 and 1937 is shown by the chart in Figure 24. Truck shipments constituted three per cent of the total in 1932-33, four per cent in 1936-37 and 15 per cent in 1937-38. As indicated in the chart there is a very definite upward trend in the truck transportation of Michigan beans. The Michigan Elevator Exchange, whose operations are used in this study as representative of the bean industry, did not begin using truck transportation to an appreciable extent until 1936, and consequently the increasing trend of truck shipments for the Michigan bean industry as a whole has been of longer duration and of greater degree than for that of

*This graph was previously presented in Figure 11 but is again shown here to avoid an inaccurate interpretation of the chart in Figure 24.


A. Monthly Percentage Distribution of Total Truck and Rail Shipments
Source: Appendix Table 11.
10
5


A. Monthly Percentage Distribution of Total Truck and Rail Shipments
Source: Appendix Table 11.
18.6
Per Cent of Yearly Shipments
15
10
5
B. Comparative Monthly Percentage Distribution of Truck and Rail Shipments
Per Cent of Monthly Shipments
100
90
80
70
60
50
40
30
20
10
0
Truck
Rail
S O N D J F M A M J J A
1932-33

the Exchange alone.[1]

The seasonal distribution of truck shipments is very irregular throughout the entire year, whereas the monthly movement of rail shipments is heavy during the fall and lighter and somewhat less variable during the remainder of the year. The comparative proportion of truck shipments to canners and the dry bean trade varies more widely from month to month than is true of rail shipments. Table 12 shows the proportion of the total rail and total truck shipments to the canning and dry bean trade for the three selected crop years.

Table 12. - Proportions of Total Rail and Total Truck Shipments to Canners and Dry Bean Trade, 1932-33, 1936-37 and 1937-38.

Class of Shipment	1932-33 Per Cent Taken by Canners	Dry Bean Trade	1936-37 Per Cent Taken by Canners	Dry Bean Trade	1937-38 Per Cent Taken by Canners	Dry Bean Trade
Rail	33.3	66.7	54.5	45.5	37.7	62.3
Truck	32.7	67.3	29.9	70.1	52.4	47.6

1. The following table shows the volume of the total crop movement as estimated by the M.B.S.A. moved by truck and less-carlot and by carlot for 1932-33 to 1937-38.

Crop Years	Truck and L.C.L. (bags)	Per Cent of Total	Carlot (bags)	Per Cent of Total	Total Crop Movement (bags)
1932-33	498,743	11.8	3,717,560	88.2	4,216,303
1933-34	475,568	16.4	2,427,279	83.6	2,902,847
1934-35	615,493	18.0	2,809,099	82.0	3,424,592
1935-36	711,101	17.1	3,440,995	82.9	4,152,096
1936-37	421,901	19.2	1,770,713	80.8	2,192,614
1937-38	833,058	25.1	2,482,514	74.9	3,315,572

This table clearly indicates the steadily increasing trend in truck shipments with a corresponding decrease in the proportion of the crop moving as carlot shipments.

It appears from Table 12 that during the season of 1932-33 the canners received approximately equal proportions of both the rail and truck shipments (33 per cent) and the dry bean trade similarly received equal proportions of each type of shipment (67 per cent). In the poor quality season 1936-37 with a 10 per cent pick the canners received 54 per cent of the rail shipments but only 30 per cent of those by truck. The relatively inelastic demand for navy beans by canneries as compared to the dry bean trade resulted in a high proportion of the carlot shipments of the small crop of 1936 being taken by the canning trade. Only 30 per cent of the truck shipments were taken by the canners as they are reluctant to purchase beans of variable quality and high moisture content. The dry bean trade on the other hand has small and widely scattered storage facilities and thus purchases a smaller proportion of the carlot shipments and a larger proportion of the truck lots. With the larger and higher quality crop of 1937-38 the canning trade secured 52 per cent of the truck shipments and only 38 per cent of the rail shipments. The dry bean trade received the greater proportion of carlot shipments largely due to the greater production and because the higher quality and low moisture content assured little difficulty in storage. It appears that the proportions of both truck and rail shipments taken by either the canning or dry bean trade will tend to vary directly with the size of the crop.

Destinations and Declining Importance of Less-carlot Shipments. The destinations of all l.c.l. shipments for the three selected crop years are shown in Figures 25, 26 and 27. A relatively large number of l.c.l. shipments were made in 1932-33 and were largely distributed in the eastern and mid-western states. Very few l.c.l. shipments were made in 1936-37 and

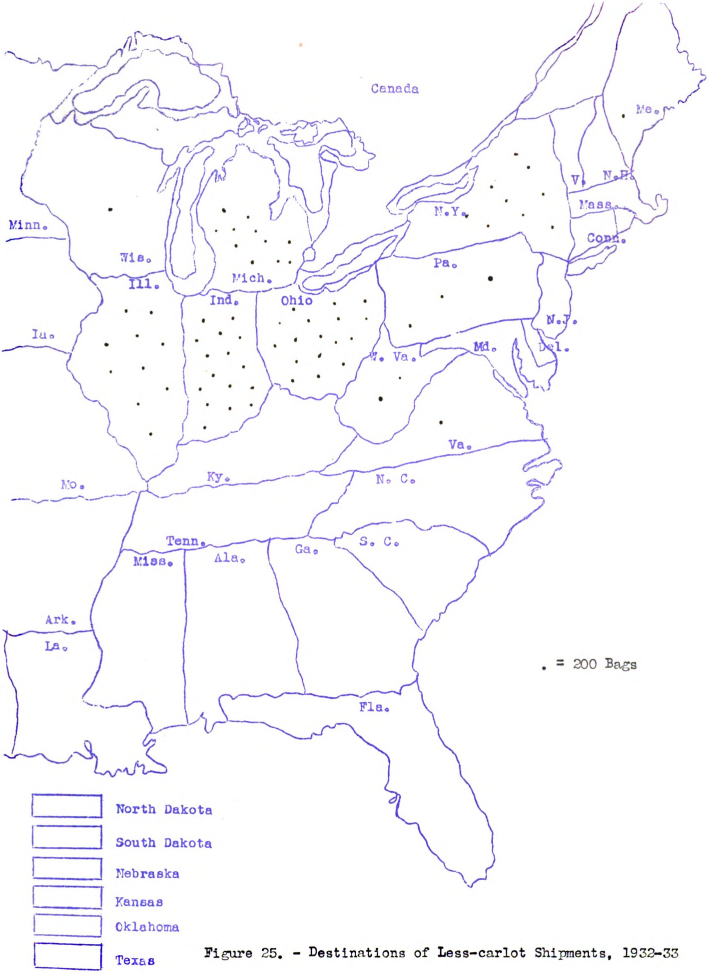


Figure 25. - Destinations of Less-carlot Shipments, 1932-33

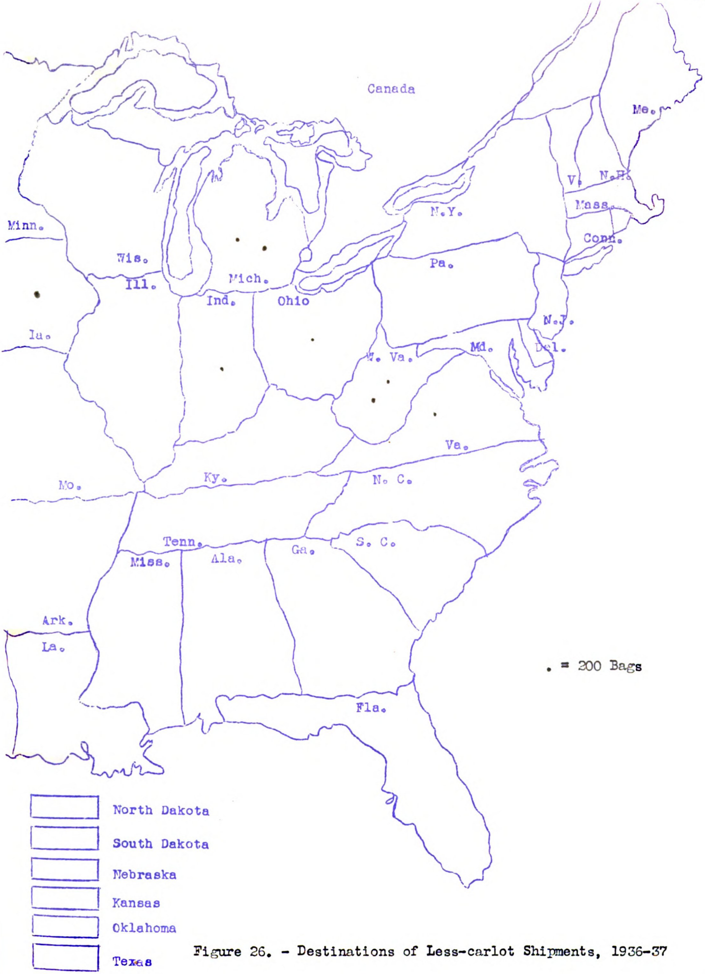


Figure 26. - Destinations of Less-carlot Shipments, 1936-37

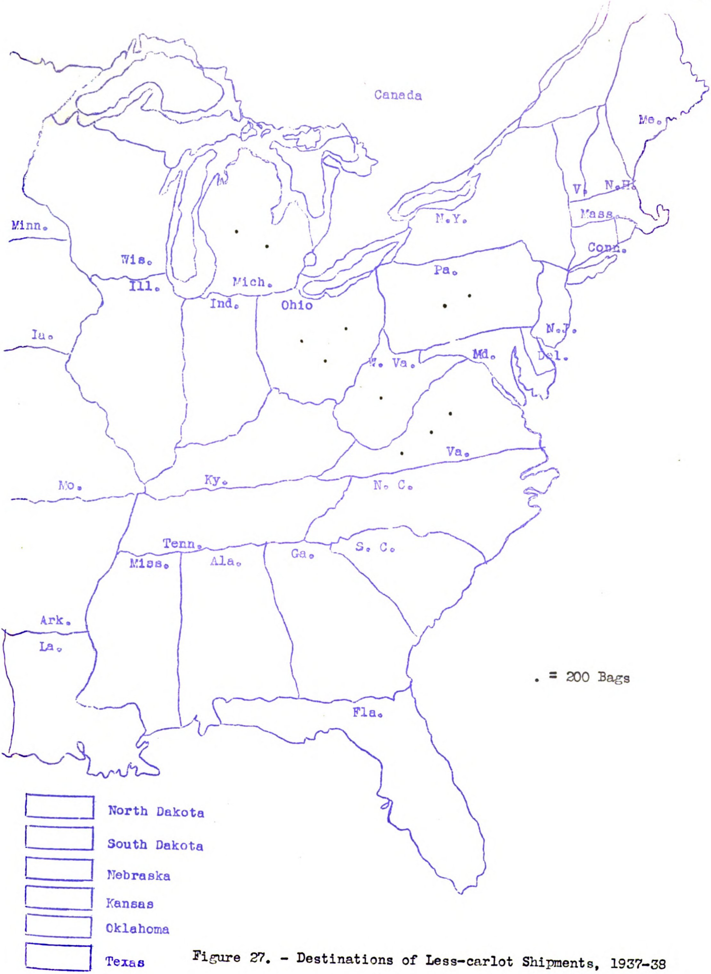


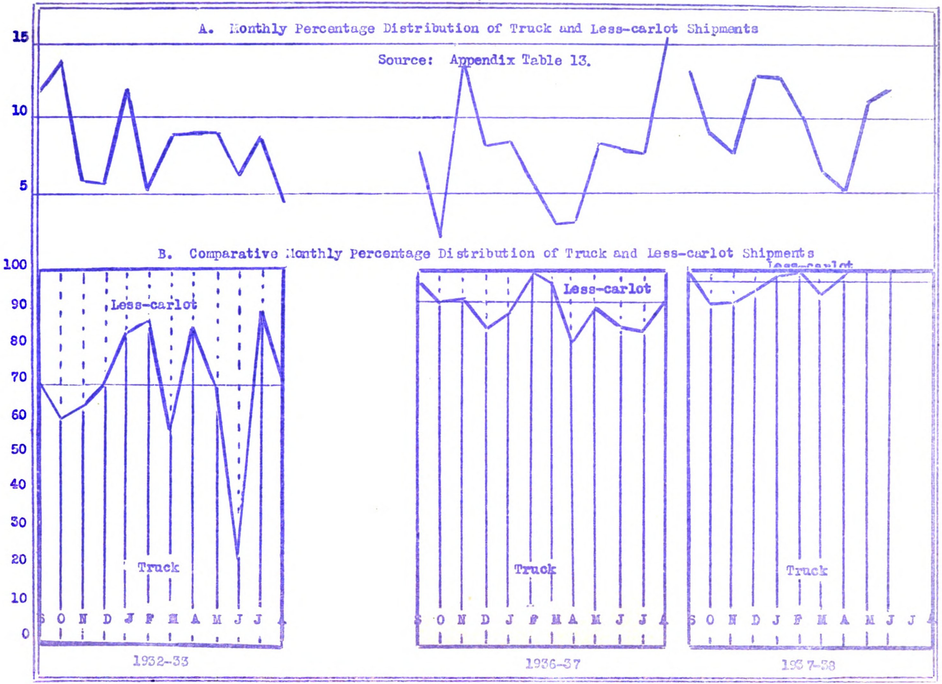
Figure 27. - Destinations of Less-carlot Shipments, 1937-38

1937-38, as this method of transportation has been largely replaced by the trucks.

The graph in Figure 28 (Table 13, Appendix) shows the monthly distribution of truck and l.c.l. shipments to be very irregular during each of the three selected years.

The comparative monthly distribution of l.c.l. shipments and truck shipments is shown by the chart in Figure 28 for the crop years of 1932, 1936 and 1937. This chart reveals the rapid disappearance of l.c.l. shipments in contrast to the increasing importance of truck shipments of Michigan beans. Of the total truck and less-carlot shipments, approximately 31 per cent in 1932-33, nine per cent in 1936-37 and three per cent in 1937-38 were l.c.l. shipments.

Figure 28


A. Monthly Percentage Distribution of Truck and Less-carlot Shipments
Source: Appendix Table 13.
15
10
5
B. Comparative Monthly Percentage Distribution of Truck and Less-carlot Shipments
100
90
80
70
60
50
40
30
20
10
0
Less-carlot
Truck
S O N D J F M A M J J A
1932-33
1936-37
1937-38

MARKET QUALITY TRENDS AS DETERMINED BY GRADES AND INSPECTIONS

The market quality of Michigan beans is measured in this study by two indices; namely, the proportion of the crop movement inspected by the Michigan Bean Shippers Association and the distribution by grades of these inspected shipments. Although the proportion of the crop movement inspected is not a direct index of the quality of the product marketed, it serves as an indication of an effort to improve the marketability of a particular season's crop.

Following the presentation of Michigan bean grades and a description of the inspection service, the relationship of the number of annual inspections to size of crops and the inspections by districts is discussed. The most accurate index of the market quality of Michigan beans is to be found in the percentage distribution by grades of inspected shipments. Although these data were available for only 1936 and 1937 the percentage grade distribution of inspected shipments is presented in relation to method of transportation and by district of origin.

Michigan Bean Grades. The grades for Michigan beans used by the M.B.S.A. and later established as official state grades by the Commissioner of Agriculture are:*

> Michigan Choice Hand Picked Navy Beans must be good average color of crop year, sound, dry, well screened, and well hand picked, and must not contain more than one and one-half per cent of large or medium beans, trace of foreign material not to exceed 1/100 of 1% allowed.

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*"An Order to Provide for Standard Michigan Grades for Dry Edible Beans." Michigan State Department of Agriculture, September 1, 1938.

Michigan Prime Hand Picked Navy Beans must be fairly good average color of crop year, sound, dry, well screened and well hand picked, and must not contain more than three per cent of discolored ans split beans, and not more than seven per cent of large or medium beans; trace of foreign material not to exceed 1/100 of 1% allowed.

Michigan Choice Recleaned Navy Beans must be good average color of crop year, sound, dry, well screened and must not contain more than a total of two per cent of discolored or split beans and foreign substance, and not more than seven per cent of large or medium beans.

Michigan Fancy Screened Navy Beans must be of fair average color, sound, dry, well screened and must not contain more than three per cent of discolored beans, splits, or foreign substance, and not more than ten per cent of large or medium beans.

Michigan Picking Stock Beans to be of no established grade, with regulations limiting the movement of picking stock between plants within the state.

These above grades have long been used by the Michigan Bean Shippers Association but not until September, 1938, was the use of these grades made compulsory by the State Department of Agriculture.

Inspection Service. Records of inspections by the Michigan Bean Shippers Association were used in this study as the basis for determining the quality of Michigan beans. Although the Federal government had maintained a voluntary bean inspection program in Michigan in recent years, its operations were limited to the districts of Grand Rapids and Port Huron where they had cooperative agreements with the Chambers of Commerce.

As the Association has maintained inspectors in the entire bean producing area, they have been largely responsible for the inspection of Michigan beans. The records of the Association were, therefore, considered adequate for determining the quality of Michigan bean shipments. The M.B.S.A. in cooperation with the state employs several inspectors who secure representative samples of bean shipments, determine the grade of each lot and issue inspection certificates for use by the trade. Records of the total number of annual inspections since 1932 were secured but grades of the inspections were available for only 1936 and 1937.

The M.B.S.A. is a trade association with the voting powers of its members distributed by districts which are weighted according to the number of elevators located within each area. These districts are shown in Figure 29. The inspections are neither made nor reported strictly on a district basis, as it is often more convenient for an inspector to operate in the area near his residence. Two or three inspectors may operate cooperatively in their respective districts. To secure uniformity and comparability, however, this study of quality is made on the district basis.

Relationship of Inspections to Size of Crop. An analysis of the inspection records from 1932 to 1937 indicates that an increasing proportion of the crop movement is being inspected, as shown in Figure 30 (Table 14, Appendix). Although the crops moved during the last five years were smaller than in 1932-33, the proportion inspected has increased. An extraordinarily large proportion of the crop movement in 1936-37 was inspected because of the very poor quality which always encourages an increased use of the inspection service by both shippers and buyers.

Inspections by Districts. The proportion of the crop movement from each district inspected annually by the M.B.S.A. inspection service from

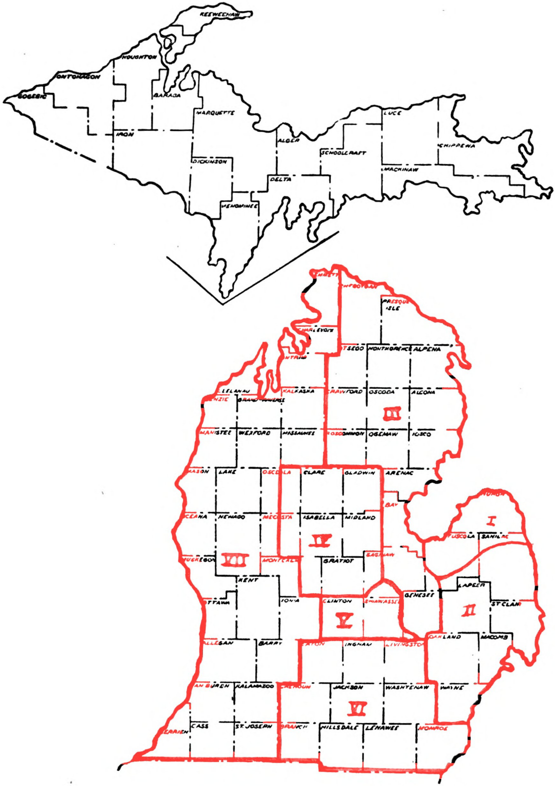


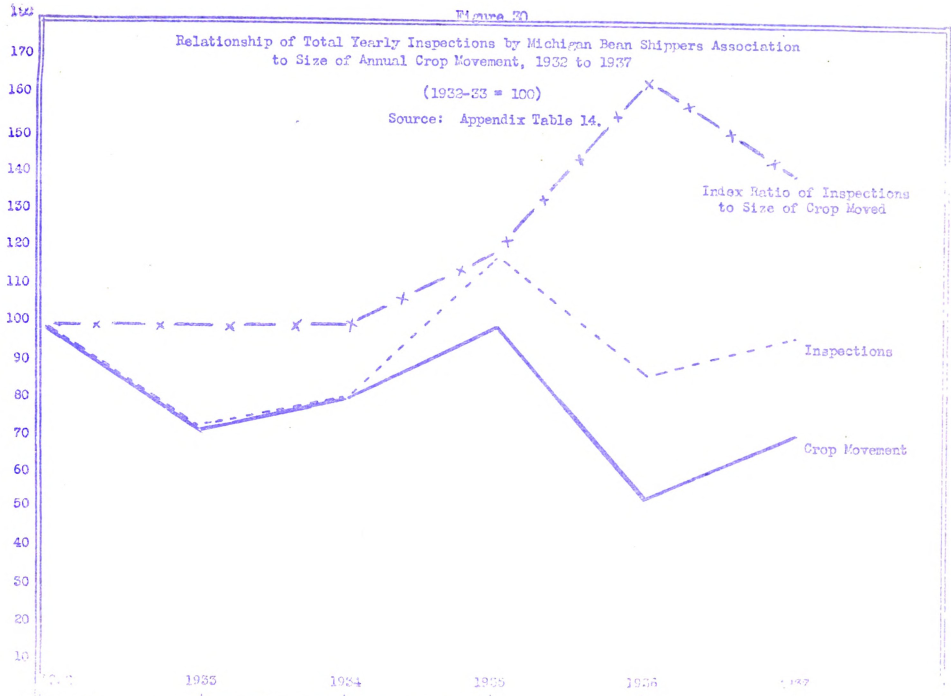
Figure 29. - Districts of Michigan Bean Shippers Association

Figure 30

Relationship of Total Yearly Inspections by Michigan Bean Shippers Association
to Size of Annual Crop Movement, 1932 to 1937

(1932-33 = 100)

Source: Appendix Table 14.



1932 to 1937 is presented in Figure 31 (Tables 15, 16 and 17, Appendix). In every district except No. V. an increasing proportion of the shipments are being inspected. As members of the trade recognize the value of the inspection service in improving the market quality of Michigan beans such an increase would be expected in each district. A greater proportion of the 1936 crop was inspected than in the 1937-38 season due to the exceedingly poor quality in the former year and unusually high quality in the latter.

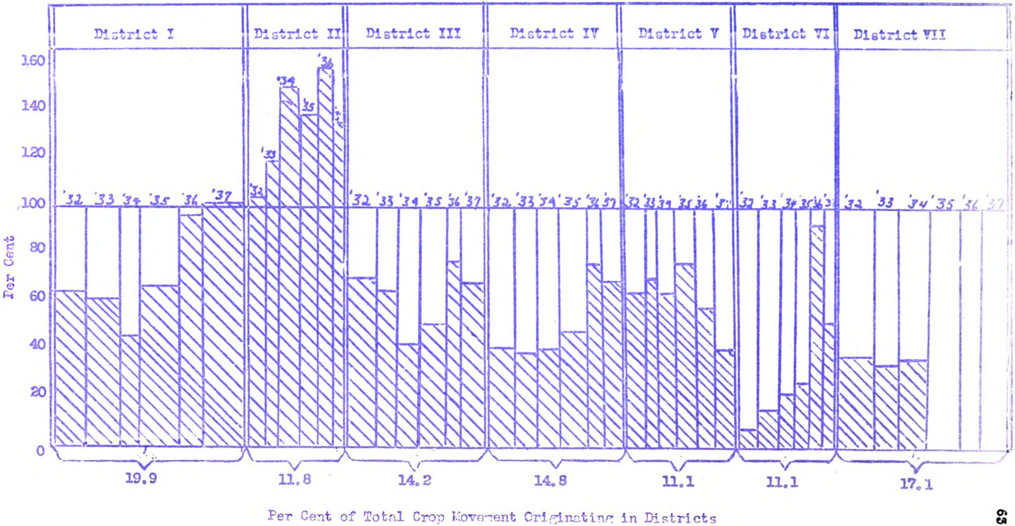
As indicated in Figure 31 there are more beans inspected in District II than originate in that area. Beans from other districts are shipped to the terminal plant at Port Huron for further conditioning or processing and are inspected as they move from this elevator. As there is no method of arriving at the actual amount of "overflow" which originated in other districts and is inspected in District II, the proportion of beans moved from this district that are inspected by the Association cannot be determined. The chart indicates that in 1937 District I also had more beans inspected than moved out of that area, which is probably due to a duplication of inspections, since shipments of picking stock are often inspected more than once as they move from plant to plant within that area.

The only district with a declining proportion of its crop movement inspected is District V. As was pointed out in the section entitled "Origin of Shipments and Transportation Methods," District V is the area with the greatest increase of truck shipments of beans. As the M.B.S.A. has offered warehouse inspection service since May, 1935, it would be expected that an increasing proportion of the truck shipments from this area would be inspected. In 1935-36 this district had 77 per cent of its crop movement inspected compared with 56 per cent and 43 per cent in 1936-37 and 1937-38,

Figure 31

Proportion of Bean Crop Movement Annually Inspected in Michigan by Districts, 1932-33 to 1937-38

Source: Appendix Tables 15, 16 and 17.



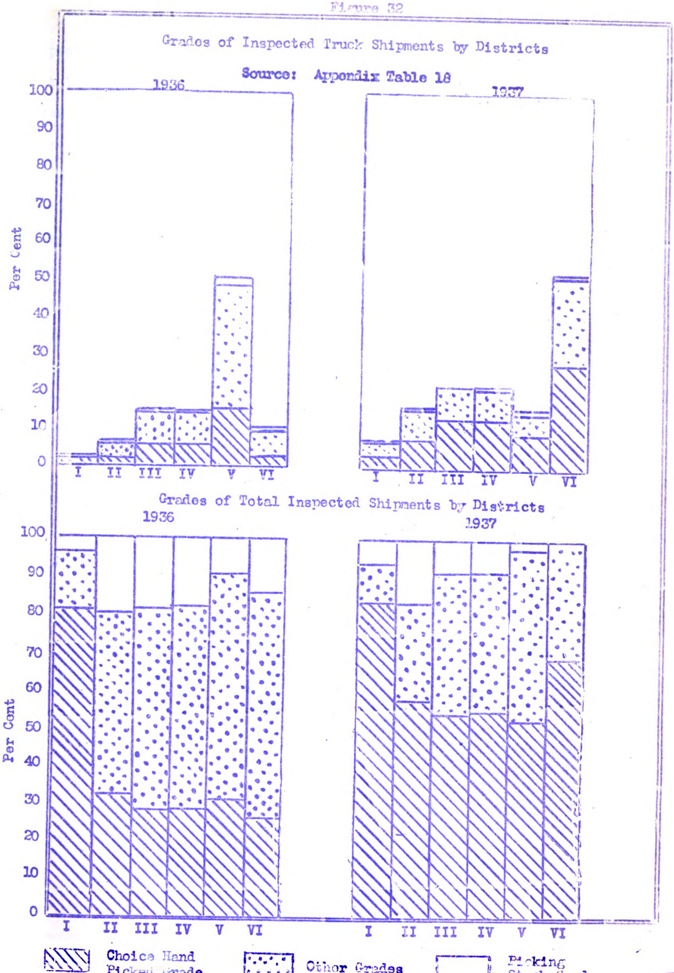
respectively. Evidently, as the proportion of the crop movement shipped by truck increases and the proportion shipped by rail decreases, a smaller percentage of the crop is inspected. A higher proportion of truck shipments move out uninspected than of rail shipments.

The proportion of the crop movement inspected in District VI dropped from 97 per cent in 1936-37 to 54 per cent in 1937-38. A great number of truck shipments in 1937 originated in that area; and again, the higher proportion of truck shipments moving out uninspected explains this rapid decline.

Grades of Total Inspected Shipments by Districts. The grades shown by the total rail and truck inspections in each district for 1936 and 1937 are presented in the lower chart in Figure 32 (Table 18, Appendix). A much greater proportion of inspected beans in 1937-38 were of C.H.P. grade than in 1936-37. Every district except No. I showed this marked increase in C.H.P. shipments of beans. The poor quality crop in 1936 resulted in a large proportion of picking stock and "other" grades and a smaller proportion of C.H.P. grade. With the excellent quality 1937 crop a larger proportion of inspected beans were C.H.P. grade and a smaller proportion of picking stock and "other" grades. District I, unlike the other five districts, shipped over eighty per cent of its inspected beans as C.H.P. grade for both years. This district also had an unusually high proportion of its crop movement inspected, as shown in Figure 31. This district shipped a high proportion of its crop as the highest grade regardless of the seasonal condition of the crop which serves as an indication that it is also possible in other districts.

Grades of Inspected Truck Shipments by Districts. The upper chart in Figure 32 (Table 18, Appendix) shows the grades of trucklot inspections by districts for 1936-37 and 1937-38. Approximately 22 per cent of the total

Figure 32



Grades of Inspected Truck Shipments by Districts
Source: Appendix Table 18
1936
1937
Per Cent
100
90
80
70
60
50
40
30
20
10
0
I
II
III
IV
V
VI
Grades of Total Inspected Shipments by Districts
1936
1937
Choice Hand Picked Grade
Other Grades
Picking Stock

inspections of beans were on truck shipments during the 1937 season compared with 16 per cent during the previous crop year. Every district except No. V showed an increase of truck inspections during the latter year. Approximately 50 per cent of the total inspections in District V were on truck shipments in 1936, which explains in part the fact that 60 per cent of the beans inspected in this area were shipped as "other" grades. During the season of 1937-38 truck inspections of beans in this district amounted to only 15 per cent of the total inspections, although the total truck shipments increased considerably during the latter year. It is evident that only a small proportion of the truck shipments from District V were inspected in 1937. District VI, on the other hand, increased its proportion of truck inspections from approximately 10 per cent in 1936 to over 50 per cent in 1937. Truck shipments of beans increased considerably during the latter year in this area which effected the greater proportion of truck inspections.

A greater proportion of the truck shipments were of C.H.P. grade in 1937 than in 1936. The inspection records indicate than an appreciably greater proportion of "other" grades are found in truck shipments than in carlots. Thus it appears that a higher quality product tends to be shipped by rail and the poorer quality by truck. There is, however, an indication of improvement in the grade of beans shipped by truck, as the proportion of C.H.P. truck shipments was greater in 1937-38 than during the previous season.

INTERRELATIONS OF SEASONAL FACTORS, MARKET DISTRIBUTION AND TRANSPORTATION TRENDS

Relationship of Inspected Shipments to Method of Transportation. A comparison of the volume of crop movements and the proportions of the tonnage inspected for rail and truck shipments in 1936-37 and 1937-38 is presented in Table 19, page 68.

Approximately 78 per cent of the crop moved in 1936-37 was inspected by the M.B.S.A. inspection service compared with 66 per cent in 1937-38. The decline in the proportion of the crop movement inspected is largely due to the high quality of the 1937 crop, which resulted in a larger proportion of uninspected bean shipments. Approximately 87 per cent of the rail shipments were inspected in 1936 compared with 72 per cent in 1937. The proportion of inspected truck shipments increased from 42 per cent in 1936 to 48 per cent in 1937. It is obvious that the inspected proportion of rail shipments is much greater than that of truck shipments. The proportion of inspected truck shipments, however, is increasing while that of rail shipments fluctuates with the quality of the crop. The proportion of the total crop moved by truck amounted to 21 per cent in 1936-37 and 24 per cent in 1937-38. Approximately 12 per cent of the total inspections were for truck shipments in 1936-37 compared with 18 per cent in 1937-38. While the percentage of the total crop movement shipped by truck is increasing, the proportion of truck shipments which are inspected is increasing at a more rapid rate.

Relationship of Seasonal Quality of Crop to Origin of Bean Shipments. Weather conditions during the growing and harvesting season is the most important single factor determining the quality of the Michigan bean crop.

Table 19. - Comparison of Crop Movement and Proportions of Crop Inspected for Rail and Truck Shipments, 1936-37 and 1937-38*

	1936-37	1937-38	Per Cent of Increase of 1937 over 1936
Crop Movement			
Rail Shipments (Bags)	1,417,405	2,208,309	55.8
Rail Shipments (Per Cent of Total Crop Moved)	78.8	75.5	
Truck Shipments (Bags)	381,576	718,100	88.2
Truck Shipments (Per Cent of Total Crop Moved)	21.2	24.5	
Total Crop Movement (Bags)	1,798,981	2,926,409	62.7
Inspected by M.B.S.A.			
Rail Shipments (Bags)	1,238,500	1,598,500	29.1
Rail Shipments (Per Cent of Total Inspection)	88.4	82.4	
Truck Shipments (Bags)	161,729	341,782	111.3
Truck Shipments (Per Cent of Total Inspection)	11.6	17.6	
Total Inspection (Bags)	1,400,229	1,940,282	38.6
Per Cent of Crop Movement Inspected	77.8	66.3	
Ratio of Truck Inspection to Truck Movement	42.4	47.6	
Ratio of Rail Inspections to Rail Movement	87.4	72.4	

*Exclusive of September and October, 1936 and July and August, 1937.

The marketing procedure is usually more seriously affected under adverse conditions in the border counties of the bean producing area than in the heart of the region. Consequently, with a small and poor quality crop the distribution of the points of origin of bean shipments is somewhat more restricted than during a year of a large and high quality crop. The distribution of the points of origin of both carlot and truck shipments was more restricted in 1936-37 compared with the rather wide distribution in 1932-33 and 1937-38.

Relationship of Processing for Market Quality to Volume Handled by Terminal Plant and Local Elevators. The comparative volume of terminal plant and local elevator shipments is largely dependent upon the quality of the crop produced. A poor quality crop and a high moisture content such as the 1936 crop, necessitates the processing of a larger proportion of the beans before sale. With a low quality crop a larger proportion of both carlot and truck shipments go through the terminal elevator, and with a high quality crop the proportion shipped direct from the local elevators increases. Consequently, if a superior and more uniform quality of Michigan beans is to be placed on the market, either shipments through the terminal plant will increase or there must be an expansion of the use of facilities for processing beans at the local elevators.

Relationship of Seasonal Quality to Distribution of Terminal Plant and Local Elevator Shipments between the Canning and Dry Bean Trade. The proportion of shipments from the local elevators and terminal plant to either the canning or dry bean trade is largely dependent on the quality of the crop. During a poor quality crop year the tonnage going through the terminal plant increases, as both the canning and dry bean trade desire to secure a more uniform quality product. Although both groups of the trade increase their

purchases from the terminal elevator in a year of poor quality and high moisture content, a greater proportion of the terminal plant shipments is taken by the dry bean trade. During high quality seasons the greater proportion of the terminal plant shipments are to the canning trade. Both groups object to beans of high moisture content, particularly the dry bean trade as they generally lack the adequate storage facilities which the canneries maintain. A poor quality crop changes the normal crop movement to both the canning and dry bean trade due to the lag between farmer deliveries and deliveries to the consuming trade caused by processing.

Relationship of Seasonal Quality of Crop to Sales Outlets. The quality of the crop considerably affects the sales outlets for Michigan beans. A high quality crop results in a larger proportion of the beans shipped direct to the consuming trade from the local elevators with a corresponding restricted distribution of terminal plant shipments. The opposite situation arises during years of poor quality crops; namely, contraction of the marketing territory of shipments direct from local elevators. In years of large production, high quality and low moisture content the dry bean trade takes the greater proportion of Michigan beans. During such years there is a considerable expansion in the marketing territory for dry beans, usually west of the Mississippi and in the southwest. With years of small crops, poor quality and high moisture content, the canning trade receives the greater proportion of Michigan bean shipments. During these years there is considerable restriction of the marketing territory, as the canneries are localized at fewer points.

SUMMARY AND CONCLUSIONS

Assembling Michigan Beans for Market

The bulk of the Michigan bean crop has long been transported to market by rail and not until the last few years has an appreciable proportion of the crop moved to market by truck. Naturally, the railroads have been vitally concerned with the advent of the motor truck into the field of transporting beans. The competition of the motor truck was at first limited to the transporting of the smaller lots which had formerly moved as less-carlot shipments. Although truck shipments are rapidly increasing, the bulk of the crop is still being moved by the railroads. Carlot shipments of beans originate over the entire bean producing area, while truck shipments originate chiefly in the border counties of this region. There is, however, a definite indication that the use of the truck is rapidly increasing and will undoubtedly be used throughout the entire bean producing region within the next few years. As the proportion of the crop moving by motor truck increases, the railroads are likely to adopt measures of some type to curb or impede rapid developments of their competitor.

Another important trend is that truck shipments are likely to increase as managers of local elevators observe the opportunity to reduce their economic risks by moving their bean stocks more frequently. The increasing use of motor truck transportation may result in a larger proportion of the crop moving to the consuming trade direct from the local elevators, thus tending to eliminate the functions performed by the jobbing agencies. If a larger proportion of the crop were moved to market direct from the local elevators without the use of jobber services, the bargaining power of

the growers would be considerably weakened, especially in years of heavy production, as such a development would clearly result in a buyers' market for Michigan beans. Efficient sales organizations, particularly of a cooperative type, such as the Michigan Elevator Exchange, that concentrate the sales volume of individual producers are necessary to maintain the farmers' bargaining power if the ill effects of a buyers' market are to be mitigated.

The proportion of the total annual crop movement going through either the terminal elevators or direct to the consuming trade from the local elevators tends to vary with the size, quality and moisture content of the crop. An inferior quality crop needs considerable processing and conditioning before it is marketable. Since compulsory inspection of bean shipments is now enforced by the Michigan State Department of Agriculture it is probable that a greater proportion of the crop will be processed at the terminal elevators than in previous years unless local elevators expand their own facilities for processing in order to maintain or increase their sales direct to the consuming trade.

<u>Destinations and Sales to Canners and the Dry Bean Trade</u>

The data in this study indicate that approximately 60 per cent of the Michigan production is sold to the dry bean trade and 40 per cent to canners. It appears from this study that the dry bean trade secures the bulk of their shipments during the early part of the crop year, while the canning trade follows no consistent policy as to the period of making their heavy purchases but buy more or less intermittently whenever they consider the price most favorable. For this reason the canners probably exert a

stronger influence in affecting the price of beans than the dry bean trade, although the greater proportion of the Michigan production is purchased by the latter group. As the canners process, pack and sell under their own brands, the per capita consumption of canned beans is dependent largely upon the sales and advertising campaigns of the canning companies. Thus it seems probable that the greatest possibility of increasing the per capita consumption of beans lies in an increased sale of dry beans.

Truck shipments to both the canning and dry bean trade are increasing. Unless an increase in consumption occurs this situation will inevitably result in a decrease of carlot shipments. At the present time efficient truck transportation of Michigan beans seems to be limited to a 400 to 600 mile radius. Over half of the truck shipments during the three years selected for this study were taken by the dry bean trade. Wholesale grocers of dry beans have preferred the truck-lot shipments to enable them to reduce their economic risks by a more frequent turnover of stock. These truck shipments to the dry bean trade have been frequently considered to be of inferior quality, as very few of the truck shipments were inspected compared to rail shipments. Since the installation of compulsory inspection of Michigan beans, truck shipments should be of higher quality and result in a greater demand for dry beans because the dry bean trade will necessarily receive a higher and more uniform quality product.

The variation in the proportion of carlot shipments to the canning and dry bean trade appears to be dependent on the quality and moisture content of the crop. The dry bean trade particularly objects to beans of high moisture content and with such crops the greater proportion of the shipments are to the canneries. It is likely that the canneries will continue to receive in the future a greater proportion of their beans by rail than by

truck as their large purchases are more economically transported by rail. Several of the large canneries are also located at distances too far to be easily reached by motor truck transportation. Future truck shipments to both canners and the dry bean trade will increase only within economical trucking distance.

Quality of Michigan Beans

For the last few years there has been a definite upward trend in the proportion of the crop movement inspected before moving to market. In order to make this inspection program more complete the Michigan Bean Shippers Association began offering warehouse inspections of beans in 1935. Although a smaller proportion of truck shipments of beans have been inspected than rail shipments, the proportion of total truck shipments which were inspected has rapidly increased. The offering of warehouse inspections was an indication that the Michigan bean industry was already recognizing the value of shipping a high quality product by truck. The greatest step to date in this direction was consumated in September, 1938, when the grading and inspection of all Michigan beans for market distribution was made compulsory. With mandatory grading of beans there is little doubt that the higher grade product which is marketed will encourage the consumption of Michigan beans, enable it to compete even more successfully with other varieties of commercial importance, and create a more vigorous, healthful condition of the Michigan bean industry.

RECOMMENDATIONS

1. Marketing agencies within the bean industry need to recognize the trend of increasing truck shipments and adjust their marketing policies to conform with this development.
2. The trend in direct truck shipments from local elevators to the consuming trade is curtailing the bargaining power of the cooperative sales organization. The organization needs to develop new procedures to maintain and strengthen its bargaining power if it is to continue to be of service to bean growers.
3. A combination of present trucking operations of local elevator associations into a state-wide cooperative trucking service might increase the bargaining power of the cooperatives through at least partial control of transportation costs.
4. Every possible effort toward increasing the sales outlets for Michigan beans should be utilized by the Michigan bean industry. The placing of a more uniform and higher quality product upon the market will materially aid Michigan beans to compete with other bean varieties and other food products.
5. Farmers, jobbing agencies, trade associations and members of the dry bean trade could advantageously promote a continuous cooperative advertising campaign to increase navy bean sales.
6. The market quality of Michigan beans should be raised to the greatest possible extent by increasing the proportion of the Choice Hand Picked grade which moves to market. Approximately only half of the beans marketed during the last two years were of C.H.P. grade. The grade of

Michigan Fancy Screened Navy beans is of too inferior quality for commercial purposes and could well be abolished.

7. Local elevator associations lacking adequate processing facilities could improve their financial condition by shipping their beans to terminal plants for sale by the cooperative sales organization. This would materially strengthen the bargaining power of bean growers and local elevators and make a more stabilized industry.

APPENDIX

Table 4. - Total Bean Shipments from Terminal Plant and Local Elevators, 1932-33, 1936-37 and 1937-38

(carlot, truck and less-carlot)

	1932-33						1936-37						1937-38					
	Terminal Plant		Local Elevators		Total		Terminal Plant		Local Elevators		Total		Terminal Plant		Local Elevators		Total	
Months	Carlot Equivalent	Monthly Per Cent*	Carlot Equivalent	Monthly Per Cent*	Carlot Equivalent	Yearly Per Cent**	Carlot Equivalent	Monthly Per Cent*	Carlot Equivalent	Monthly Per Cent*	Carlot Equivalent	Yearly Per Cent**	Carlot Equivalent	Monthly Per Cent*	Carlot Equivalent	Monthly Per Cent*	Carlot Equivalent	Yearly Per Cent**
Sept.	30.00	21.5	109.76	78.5	139.76	7.7	23.51	32.1	49.80	67.9	73.31	7.5	38.18	36.5	66.38	63.5	104.56	9.9
Oct.	57.00	20.4	222.01	79.6	279.01	15.3	37.00	45.2	44.85	54.8	81.85	8.3	60.40	30.7	136.62	69.3	197.02	18.6
Nov.	54.00	31.1	119.44	68.9	173.44	9.5	60.38	42.9	80.50	57.1	140.88	14.3	54.67	39.4	83.96	60.6	138.63	13.1
Dec.	47.03	30.3	108.18	69.7	155.21	8.5	72.01	59.8	48.40	40.2	120.41	12.2	39.02	39.6	59.42	60.4	98.44	9.3
Jan.	46,80	29.6	111.29	70.4	158.09	8.7	52.67	52.3	47.97	47.7	100.64	10.2	49.59	42.9	65.95	57.1	115.54	10.9
Feb.	34.00	25.1	101.66	74.9	135.66	7.5	72.55	61.7	45.07	38.3	117.62	12.0	38.45	39.8	58.26	60.2	96.71	9.1
Mar.	47.00	30.9	105.17	69.1	152.17	8.4	45.41	70.6	18.87	29.4	64.28	6.5	28.61	31.4	62.65	68.6	91.26	8.6
Apr.	27.06	24.1	85.10	75.9	112.16	6.2	35.12	68.4	16.25	31.6	51.37	5.2	25.80	39.0	40.42	61.0	66.22	6.4
May	34.11	23.3	112.12	76.7	146.23	8.0	36.88	44.6	45.71	55.4	82.59	8.4	22.43	31.9	47.92	68.1	70.35	6.6
June	42.26	34.5	80.34	65.5	122.60	6.7	25.72	46.4	29.65	53.6	55.37	5.6	33.08	41.8	46.09	58.2	79.17	7.5
July	45.11	34.9	84.12	65.1	129.23	7.1	37.03	60.5	24.19	39.5	61.22	6.2						
Aug.	35.32	30.1	81.84	69.9	117.16	6.4	15.62	43.9	19.93	56.1	35.55	3.6						
Total	499.69		1321.03		1820.72		513.90		471.19		985.09		390.23		667.67		1057.90	
Yearly Per Cent		27.4		72.6		100.0		52.2		47.8		100.0		36.9		63.1		100.0

*Per cent of total monthly sales.
**Per cent of total yearly sales.

Table 5. - Total Bean Shipments to Canning Trade from Terminal Plant and Local Elevators, 1932-33, 1936-37 and 1937-38

(carlot, truck and less-carlot)

	1932-33						1936-37						1937-38					
	Terminal Plant		Local Elevators		Total		Terminal Plant		Local Elevators		Total		Terminal Plant		Local Elevators		Total	
Months	Carlot Equiva-lent	Monthly Per Cent*	Carlot Equiva-lent	Monthly Per Cent*	Carlot Equiva-lent	Yearly Per Cent**	Carlot Equiva-lent	Monthly Per Cent*	Carlot Equiva-lent	Monthly Per Cent*	Carlot Equiva-lent	Yearly Per Cent**	Carlot Equiva-lent	Monthly Per Cent*	Carlot Equiva-lent	Monthly Per Cent	Carlot Equiva-lent	Yearly Per Cent**
Sept.	6.00	30.5	13.66	69.5	19.66	3.2	9.00	22.4	31.14	77.6	40.14	7.6	19.80	50.6	19.32	49.4	39.12	9.3
Oct.	10.00	24.6	30.65	75.4	40.65	6.6	12.00	32.4	25.00	67.6	37.00	7.0	15.00	21.4	55.16	78.6	70.16	16.7
Nov.	5.00	12.0	36.74	88.0	41.74	6.8	23.00	33.8	45.00	66.2	68.00	12.9	20.50	35.8	36.80	64.2	57.30	13.6
Dec.	7.00	21.9	25.02	78.1	32.02	5.2	35.00	53.8	30.00	46.2	65.00	12.4	13.02	31.8	27.95	68.2	40.97	9.7
Jan.	8.00	19.3	33.40	80.7	41.40	6.7	23.42	56.5	18.00	43.5	41.42	7.9	16.42	33.8	32.11	66.2	48.53	11.5
Feb.	8.00	24.4	24.73	75.6	32.73	5.3	43.10	57.9	31.40	42.1	74.50	14.2	12.00	29.7	28.47	70.3	40.47	9.6
Mar.	15.00	30.9	33.55	69.1	48.55	7.9	33.00	77.5	9.60	22.5	42.60	8.1	6.00	21.9	21.38	78.1	27.38	6.5
Apr.	9.06	15.5	49.44	84.5	58.50	9.5	10.00	76.9	3.00	23.1	13.00	2.5	10.00	38.6	15.92	61.4	25.92	6.3
May	20.00	19.7	81.29	80.3	101.29	16.4	20.00	50.0	20.00	50.0	40.00	7.6	5.37	19.4	22.29	80.6	27.66	6.6
June	18.00	26.0	51.32	74.0	69.32	11.2	12.00	37.5	20.00	62.5	32.00	6.1	16.42	38.3	26.50	61.7	42.92	10.2
July	17.00	27.0	45.91	73.0	62.91	10.1	26.84	59.9	18.00	40.1	44.84	8.5						
Aug.	22.00	31.9	46.90	68.1	68.90	11.1	9.78	36.2	17.26	63.8	27.04	5.2						
Total	145.06		472.61		617.67		257.14		268.40		525.54		134.53		285.90		420.43	
Yearly Per Cent		23.5		76.5		100.0		48.9		51.1		100.0		32.0		68.0		100.0

*Per cent of total monthly sales.
**Per cent of total yearly sales.

Table 6. - Total Bean Shipments to Dry Bean Trade from Terminal Plant and Local Elevators, 1932-33, 1936-37 and 1937-38

(carlot, truck and less-carlot)

	1932-33						1937-37						1937-38					
	Terminal Plant		Local Elevators		Total		Terminal Plant		Local Elevators		Total		Terminal Plant		Local Elevators		Total	
Months	Carlot Equivalent	Monthly Per Cent*	Carlot Equivalent	Monthly Per Cent*	Carlot Equivalent	Yearly Per Cent**	Carlot Equivalent	Monthly Per Cent*	Carlot Equivalent	Monthly Per Cent*	Carlot Equivalent	Yearly Per Cent**	Carlot Equivalent	Monthly Per Cent*	Carlot Equivalent	Monthly Per Cent*	Carlot Equivalent	Yearly Per Cent**
Sept.	24.00	30.0	96.10	70.0	120.10	10.0	14.51	43.7	18.66	56.3	33.17	7.2	18.38	28.1	47.06	71.9	65.44	10.3
Oct.	47.00	19.7	191.36	80.3	238.36	19.8	25.00	55.7	19.85	44.3	44.85	9.8	45.40	35.8	81.46	64.2	126.86	19.9
Nov.	49.00	37.2	82.70	62.8	131.70	10.9	37.38	51.3	35.50	48.7	72.88	15.9	34.17	42.0	47.16	58.0	81.33	12.8
Dec.	40.03	32.5	83.06	67.5	123.09	10.3	37.01	66.8	18.40	33.2	55.41	12.1	26.00	45.2	31.47	54.8	57.47	9.0
Jan.	38.80	33.3	77.89	66.7	116.69	9.7	29.25	49.4	29.97	50.6	59.22	12.9	33.17	49.5	33.84	50.5	67.01	10.5
Feb.	26.00	25.3	76.93	74.7	102.93	8.6	29.45	68.3	13.67	31.7	43.12	9.3	26.45	47.0	29.79	53.0	56.24	8.8
Mar.	32.00	30.9	71.62	69.1	103.62	8.6	12.41	57.2	9.27	42.8	21.68	4.7	22.61	35.4	41.27	64.6	63.88	10.0
Apr.	18.00	33.5	35.66	66.5	53.66	4.5	25.12	65.5	13.25	34.5	38.37	8.3	15.80	39.2	24.50	60.8	40.30	6.3
May	14.11	31.4	30.83	68.6	44.94	3.7	16.88	39.6	25.71	60.4	42.59	9.3	17.06	40.0	25.63	60.0	42.69	6.7
June	24.26	45.5	29.12	54.5	53.38	4.4	13.72	58.7	9.65	41.3	23.37	5.1	16.66	46.0	19.59	54.0	36.25	5.7
July	28.11	42.4	38.21	57.6	66.32	5.5	10.19	62.2	6.19	37.8	16.38	3.6						
Aug.	13.32	27.6	34.94	72.4	48.26	4.0	5.84	68.6	2.67	31.4	8.51	1.8						
Total	354.63		848.42		1203.05		256.76		202.79		459.55		255.70		381.77		637.47	
Yearly Per Cent		29.5		70.5		100.0		55.9		44.1		100.0		40.1		59.9		100.0

*Per cent of total monthly sales.
**Per cent of total yearly sales.

Table 7. - Carlot Shipments from Terminal Plant and Local Elevators, 1932-33, 1936-37 and 1937-38

Months	1932-33						1936-37						1937-38					
	Terminal Plant		Local Elevators		Total		Terminal Plant		Local Elevators		Total		Terminal Plant		Local Elevators		Total	
	Cars	Monthly Per Cent*	Cars	Monthly Per Cent*	Cars	Yearly Per Cent**	Cars	Monthly Per Cent*	Cars	Monthly Per Cent*	Cars	Yearly Per Cent**	Cars	Monthly Per Cent*	Cars	Monthly Per Cent*	Cars	Yearly Per Cent**
Sept.	30	23.3	99	76.7	129	7.5	23	32.9	47	67.1	70	7.4	27	32.5	56	67.5	83	9.3
Oct.	57	21.4	209	78.6	266	15.4	37	45.7	44	54.3	81	8.6	60	32.8	123	67.2	183	20.4
Nov.	54	32.1	114	67.9	168	9.7	60	44.4	75	55.6	135	14.3	53	42.1	73	57.9	126	14.0
Dec.	47	31.3	103	68.7	150	8.7	71	60.7	46	39.3	117	12.4	35	44.9	43	55.1	78	8.7
Jan.	44	30.1	102	69.9	146	8.5	52	53.6	45	46.4	97	10.3	46	47.9	50	52.1	96	10.7
Feb.	34	26.0	97	74.0	131	7.6	70	62.5	42	37.5	112	11.9	37	46.2	43	53.8	80	8.9
Mar.	47	32.6	97	67.4	144	8.3	45	71.4	18	28.6	63	6.7	28	34.6	53	65.4	81	9.0
Apr.	27	26.0	77	74.0	104	6.0	34	68.0	16	32.0	50	5.3	25	43.1	33	56.9	58	6.5
May	34	24.6	104	75.4	138	8.0	35	44.3	44	55.7	79	8.4	21	40.4	31	59.6	52	5.8
June	42	35.9	75	64.1	117	6.8	25	48.0	27	52.0	52	5.5	32	53.4	28	46.6	60	6.7
July	45	37.2	76	62.8	121	7.0	35	60.3	23	39.7	58	6.1						
Aug.	35	31.0	78	69.0	113	6.5	11	37.9	18	62.1	29	3.1						
Total	496		1231		1727		498		445		943		364		533		897	
Yearly Per Cent		28.7		71.3		100.0		52.8		47.2		100.0		40.6		59.4		100.0

*Per cent of total monthly sales.
**Per cent of total yearly sales.

Table 8. - Truck Shipments from Terminal Plant and Local Elevators, 1932-33, 1936-37 and 1937-38

Months	1932-33						1936-37						1937-38					
	Terminal Plant		Local Elevators		Total		Terminal Plant		Local Elevators		Total		Terminal Plant		Local Elevators		Total	
	Bags	Monthly Per Cent*	Bags	Monthly Per Cent*	Bags	Yearly Per Cent**	Bags	Monthly Per Cent*	Bags	Monthly Per Cent*	Bags	Yearly Per Cent**	Bags	Monthly Per Cent*	Bags	Monthly Per Cent*	Bags	Yearly Per Cent**
Sept.			3793	100.0	3793	11.9	210	13.1	1399	86.9	1609	8.4	5230	50.3	5163	49.7	10393	13.3
Oct.			3825	100.0	3825	12.0			388	100.0	388	2.0	200	3.1	6210	96.9	6410	8.2
Nov.			1665	100.0	1665	5.2			2734	100.0	2734	14.2	737	12.7	5057	87.3	5794	7.4
Dec.	6	.3	1750	99.7	1756	5.5	395	27.3	1055	72.7	1450	7.5	2010	20.7	7708	79.3	9718	12.5
Jan.	900	19.7	3675	80.3	4575	14.4	211	13.0	1410	87.0	1621	8.4	1725	17.8	7973	82.2	9698	12.4
Feb.			2020	100.0	2020	6.3	1275	45.5	1526	54.5	2801	14.5	725	8.7	7619	91.3	8344	10.7
Mar.			2223	100.0	2223	7.0	206	32.9	420	67.1	626	3.3	260	5.4	4528	94.6	4788	6.1
Apr.			3505	100.0	3505	11.0	448	81.8	100	18.2	548	2.8	400	9.8	3710	90.2	4110	5.3
May			2849	100.0	2849	9.0	849	52.0	784	48.0	1633	8.5	715	7.8	8459	92.2	9174	11.8
June			600	100.0	600	1.9	361	25.0	1084	75.0	1445	7.5	542	5.7	9045	94.3	9587	12.3
July			3599	100.0	3599	11.3	1000	73.5	360	26.5	1360	7.1						
Aug.			1421	100.0	1421	4.5	2290	75.4	747	24.6	3037	15.8						
Total	906		30925		31831		7245		12007		19252		12544		65472		78016	
Yearly Per Cent		2.8		97.2		100.0		37.6		62.4		100.0		16.1		83.9		100.0

*Per cent of total monthly sales.
**Per cent of total yearly sales.

Table 9. - Carlot Shipments to Canners and Dry Bean Trade, 1932-33, 1936-37 and 1937-38

Months	1932-33						1936-37						1937-38					
	Canners		Dry Bean Trade		Total		Canners		Dry Bean Trade		Total		Canners		Dry Bean Trade		Total	
	Cars	Monthly Per Cent*	Cars	Monthly Per Cent*	Cars	Yearly Per Cent**	Cars	Monthly Per Cent*	Cars	Monthly Per Cent*	Cars	Yearly Per Cent**	Cars	Monthly Per Cent*	Cars	Monthly Per Cent*	Cars	Yearly Per Cent**
Sept.	17	13.2	112	86.8	129	7.5	39	55.7	31	44.3	70	7.4	22	26.5	61	73.5	83	9.3
Oct.	37	13.9	229	86.1	266	15.4	37	45.7	44	54.3	81	8.6	66	36.1	117	63.9	183	20.4
Nov.	40	23.8	128	76.2	168	9.7	68	50.4	67	49.6	135	14.3	55	43.7	71	56.3	126	14.0
Dec.	30	20.0	120	80.0	150	8.7	65	55.6	52	44.4	117	12.4	26	33.3	52	66.7	78	8.7
Jan.	39	26.7	107	73.3	146	8.5	41	42.3	56	57.7	97	10.3	40	41.7	56	58.3	96	10.7
Feb.	32	24.4	99	75.6	131	7.6	71	63.4	41	36.6	112	11.9	32	40.0	48	60.0	80	8.9
Mar.	47	32.6	97	67.4	144	8.3	42	66.7	21	33.3	63	6.7	24	29.6	57	70.4	81	9.0
Apr.	54	51.9	50	48.1	104	6.0	13	26.0	37	74.0	50	5.3	23	39.7	35	60.3	58	6.5
May	98	71.0	40	29.0	138	8.0	40	50.6	39	49.4	79	8.4	18	34.6	34	65.4	52	5.8
June	69	59.0	48	41.0	117	6.8	32	61.5	20	38.5	52	5.5	32	53.3	28	46.7	60	6.7
July	61	50.4	60	49.6	121	7.0	44	75.9	14	24.1	58	6.2						
Aug.	68	60.2	45	39.8	113	6.5	22	75.9	7	24.1	29	3.0						
Total	592		1135		1727		514		429		943		338		559		897	
Yearly Per Cent		34.3		65.7		100.0		54.5		45.5		100.0		37.7		62.3		100.0

*Per cent of total monthly sales.
**Per cent of total yearly sales.

Table 10. - Truck Shipments to Canners and Dry Bean Trade, 1932-33, 1936-37 and 1937-38

Months	1932-33 Canners Bags	1932-33 Canners Monthly Per Cent*	1932-33 Dry Bean Trade Bags	1932-33 Dry Bean Trade Monthly Per Cent*	1932-33 Total Bags	1932-33 Total Yearly Per Cent**	1936-37 Canners Bags	1936-37 Canners Monthly Per Cent*	1936-37 Dry Bean Trade Bags	1936-37 Dry Bean Trade Monthly Per Cent*	1936-37 Total Bags	1936-37 Total Yearly Per Cent**	1937-38 Canners Bags	1937-38 Canners Monthly Per Cent*	1937-38 Dry Bean Trade Bags	1937-38 Dry Bean Trade Monthly Per Cent*	1937-38 Total Bags	1937-38 Total Yearly Per Cent**
Sept.	1328	35.0	2465	65.0	3793	11.9	570	35.4	1039	64.6	1609	8.4	8198	78.9	2195	21.1	10393	13.3
Oct.	1025	26.8	2800	73.2	3825	12.0			388	100.0	388	2.0	2080	32.4	4330	67.6	6410	8.2
Nov.	765	45.9	900	54.1	1665	5.2			2734	100.0	2734	14.2	1150	19.8	4644	80.2	5794	7.4
Dec.	510	29.0	1246	71.0	1756	5.5			1450	100.0	1450	7.5	7483	77.0	2235	23.0	9718	12.5
Jan.	1175	25.7	3400	74.3	4575	14.4	911	56.2	1410	43.8	1621	8.4	4263	44.0	5435	56.0	9698	12.4
Feb.	365	18.1	1655	81.9	2020	6.3	1350	48.2	1051	51.8	2801	14.5	4234	50.7	4110	49.3	8344	10.7
Mar.	488	22.0	1735	78.0	2223	7.0			326	100.0	626	3.3	1692	35.3	3096	64.7	4788	6.1
Apr.	1925	54.9	1580	45.1	3505	11.0			548	100.0	548	2.8	1460	35.5	2650	64.5	4110	5.3
May	1444	50.7	1405	49.3	2849	8.9			1633	100.0	1633	8.5	4829	52.6	4345	47.4	9174	11.8
June	100	16.7	500	83.3	600	2.0			1445	100.0	1445	7.5	5460	56.9	4127	43.1	9587	12.3
July	820	22.8	2779	77.2	3599	11.3	420	30.9	940	69.1	1360	7.1						
Aug.	451	31.7	970	68.3	1421	4.5	2520	83.0	517	17.0	3037	15.8						
Total	10396		21435		31831		5771		13481		19252		40849		37167		78016	
Yearly Per Cent		32.7		67.3		100.0		29.9		70.1		100.0		52.4		47.6		100.0

*Per cent of total monthly sales.
**Per cent of total yearly sales.

Table 11. - Total Rail and Truck Shipments, 1932-33, 1936-37 and 1937-38

Months	1932-33						1936-37						1937-38					
	Rail		Truck		Total		Rail		Truck		Total		Rail		Truck		Total	
	Carlot Equiva- lent	Monthly Per Cent*	Carlot Equiva- lent	Monthly Per Cent*	Carlot Equiva- lent	Yearly Per Cent**	Carlot Equiva- lent	Monthly Per Cent*	Carlot Equiva- lent	Monthly Per Cent*	Carlot Equiva- lent	Yearly Per Cent**	Carlot Equiva- lent	Monthly Per Cent*	Carlot Equiva- lent	Monthly Per Cent*	Carlot Equiva- lent	Yearly Per Cent**
Sept.	132.17	94.6	7.59	5.4	139.76	7.7	70.09	95.6	3.22	4.4	73.31	7.5	83.05	79.4	21.51	20.6	104.56	9.9
Oct.	271.36	97.3	7.65	2.7	279.01	15.3	81.07	99.0	.78	1.0	81.85	8.3	184.20	93.5	12.82	6.5	197.02	18.6
Nov.	169.91	98.0	3.53	2.0	173.44	9.5	135.41	96.0	5.47	4.0	140.88	14.3	127.05	91.6	11.58	8.4	138.63	13.1
Dec.	151.70	98.0	3.51	2.0	155.21	8.5	117.51	97.6	2.90	2.4	120.41	12.2	79.00	80.2	19.44	19.8	98.44	9.3
Jan.	147.94	93.6	10.15	6.4	158.09	8.7	97.40	96.8	3.24	3.2	100.64	10.2	96.14	83.2	19.40	16.8	115.54	10.9
Feb.	131.62	97.0	4.04	3.0	135.66	7.5	112.02	95.2	5.60	4.8	117.62	12.0	80.02	82.7	16.69	17.3	96.71	9.1
Mar.	147.71	97.1	4.46	2.9	152.17	8.4	63.03	98.1	1.25	1.9	64.28	6.5	81.69	89.5	9.57	10.5	91.26	8.6
Apr.	105.15	93.7	7.01	6.3	112.16	6.2	50.27	97.9	1.10	2.1	51.37	5.2	58.00	87.6	8.22	12.4	66.22	6.4
May	140.53	96.1	5.70	3.9	146.23	8.0	79.32	96.0	3.27	4.0	82.59	8.4	52.00	73.9	18.35	26.1	70.35	6.6
June	121.40	99.0	1.20	1.0	122.60	6.7	52.48	94.8	2.89	5.2	55.37	5.6	60.00	75.8	19.17	24.2	79.17	7.5
July	121.83	94.3	7.40	5.7	129.23	7.1	58.50	95.6	2.72	4.4	61.22	6.2						
Aug.	114.32	97.6	2.84	2.4	117.16	6.4	29.48	82.9	6.07	17.1	35.55	3.6						
Total	1755.64		65.08		1820.72		946.58		38.51		985.09		901.15		156.75		1057.90	
Yearly Per Cent		96.4		3.6		100.0		96.1		3.9		100.0		85.2		14.8		100.0

*Per cent of total monthly sales.
**Per cent of total yearly sales.

Table 13. - Total Truck and Less-carlot Shipments, 1932-33, 1936-37 and 1937-38

Months	1932-3						1936-37						1937-38					
	Truck		L.C.L.		Total		Truck		L.C.L.		Total		Truck		L.C.L.		Total	
	Bags	Monthly Per Cent*	Bags	Monthly Per Cent*	Bags	Yearly Per Cent**	Bags	Monthly Per Cent*	Bags	Monthly Per Cent*	Bags	Yearly Per Cent**	Bags	Monthly Per Cent*	Bags	Monthly Per Cent*	Bags	Yearly Per Cent**
Sept.	3793	70.5	1586	29.5	5379	11.7	1609	97.3	45	2.7	1654	7.9	10393	99.7	25	.3	10418	13.0
Oct.	3825	59.7	2580	40.3	6405	13.9	388	91.7	35	8.3	423	2.1	6410	91.5	599	8.5	7109	8.9
Nov.	1665	63.6	952	36.4	2617	5.7	2734	93.0	205	7.0	2939	14.0	5794	91.7	525	8.3	6219	7.7
Dec.	1756	68.7	799	31.3	2555	5.6	1450	85.1	255	14.9	1705	8.1	9718	95.2	500	4.8	10218	12.8
Jan.	4575	82.5	970	17.5	5545	12.0	1621	89.1	198	10.9	1819	8.6	9698	99.2	70	.8	9768	12.2
Feb.	2020	86.7	310	13.3	2330	5.1	2801	99.7	10	.3	2811	13.4	8344	99.9	10	.1	8354	10.4
Mar.	2223	54.6	1853	45.4	4076	8.8	626	97.6	15	2.4	641	3.0	4788	93.4	343	6.6	5131	6.4
Apr.	3505	85.9	574	14.1	4079	8.9	548	80.2	135	19.8	683	3.2	4110	100.0			4110	5.1
May	2849	69.2	1268	30.8	4117	8.9	1633	91.1	160	8.9	1793	8.5	9174	100.0			9174	11.5
June	600	21.4	2202	78.6	2802	6.1	1445	85.8	240	14.2	1685	8.0	9587	100.0			9587	12.0
July	3599	89.7	434	10.3	4033	8.8	1360	84.5	249	15.5	1609	7.6						
Aug.	1421	68.3	660	31.7	2081	4.5	3037	92.7	241	7.3	3278	15.6						
Total	31831		14188		46019		19252		1788		21040		78016		2072		80088	
Yearly Per Cent		69.2		30.8		100.0		91.5		8.5		100.0		97.4		2.6		100.0

*Per cent of total monthly sales.
**Per cent of total yearly sales.

Table 14. - Relationship of Total Yearly Inspections by Michigan Bean Shippers Association to Size of Annual Crop Movement, 1932-1937.

Crop Year	Crop Moved		Total Inspections		Index Ratio
	Bags	Index	Number	Index	
1932-33	4,216,303	100.0	4,632	100.0	100.0
1933-34	3,051,567	72.4	3,341	72.1	99.6
1934-35	3,358,532	79.7	3,668	79.2	99.4
1935-36	4,182,096	99.2	5,445	117.6	118.5
1936-37	2,192,614	52.0	3,945	85.2	163.8
1937-38*	2,926,449	69.4	4,436	95.8	138.1

*Data for July and August, 1938, not available.

Table 15. - Total Bags Shipped by Districts, Crop Years 1932-33 to 1937-38*

District	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38	Total	Per Cent
I	839,888	607,872	669,020	833,074	358,357	582,942	3,891,153	19.9
II	497,524	360,085	396,307	493,487	212,280	345,316	2,304,999	11.8
III	599,528	433,933	477,583	594,694	255,815	416,135	2,777,688	14.2
IV	621,905	450,106	495,383	616,859	265,350	431,645	2,881,248	14.8
V	466,745	337,808	371,789	462,958	199,147	323,953	2,162,400	11.1
VI	468,431	339,029	373,183	464,631	199,867	325,124	2,170,265	11.1
VII	722,252	522,734	575,317	716,393	308,165	501,294	3,346,155	17.1
Total	4,216,273	3,051,567	3,358,582	4,182,096	1,798,981	2,926,409	19,533,908	100.0
Yearly Per Cent	21.7	15.7	17.3	21.5	8.8	15.0	100.0	

*Data not available for September and October, 1936, or July and August, 1938.

Table 16. - Total Bags Inspected by Districts, Crop Years 1932-33 to 1937-38*

District	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38	Total
I	533,000	366,500	296,500	556,600	343,785	590,277	2,686,662
II	511,000	426,000	600,500	676,141	357,349	462,903	3,033,893
III	406,000	274,500	199,500	306,192	193,183	280,676	1,660,051
IV	262,500	145,500	207,000	318,690	201,068	292,132	1,426,890
V	306,500	237,500	231,500	356,254	111,787	139,121	1,382,662
VI	19,500	36,000	90,000	141,493	193,057	175,173	655,223
VII	277,500	184,500	209,000				671,000
Total	2,316,000	1,670,500	1,834,000	2,355,370	1,400,229	1,940,282	11,516,381

*Data not available for September and October, 1936, or July and August, 1938.

Table 17. - Per Cent of Crop Movement Inspected by Michigan Bean Shippers Association, Crop Years 1932-33 to 1937-38

District	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38	Average
I	63.5	60.1	44.3	66.8	95.9	101.2	72.0
II	102.7	118.3	151.5	137.0	168.3	134.1	135.3
III	67.7	63.3	41.8	51.5	75.5	67.4	61.2
IV	42.2	32.3	41.8	51.7	75.8	67.7	51.9
V	65.7	70.3	62.3	77.0	56.1	42.9	62.4
VI	4.2	10.6	24.1	30.5	96.6	53.9	36.7
VII	38.4	35.3	36.3				36.7
Weighted Average	54.9	54.7	54.4	68.0	93.9	80.0	

Table 18. - Grades of Inspected Truck and Rail Shipments, 1936-37 and 1937-38

District	1936-37* C.H.P. Carlot Shipments	1936-37* C.H.P. Truck Shipments	1936-37* Picking Stock Carlot Shipments	1936-37* Picking Stock Truck Shipments	1936-37* Others Carlot Shipments	1936-37* Others Truck Shipments	Total Bags	Total Per Cent	1937-38** C.H.P. Carlot Shipments	1937-38** C.H.P. Truck Shipments	1937-38** Picking Stock Carlot Shipments	1937-38** Picking Stock Truck Shipments	1937-38** Others Carlot Shipments	1937-38** Others Truck Shipments	Total Bags	Total Per Cent
	Bags															
I	276,500	5,500	12,000	1,350	46,500	1,935	343,785	24.6	470,750	20,980	35,000	1,350	47,250	14,947	590,277	30.4
II	102,500	8,233	68,000	1,380	166,500	10,736	357,349	25.5	229,500	33,065	77,750	2,912	83,250	36,426	462,903	23.8
III	44,100	9,828	34,545	1,045	87,710	15,955	193,183	13.8	113,680	38,593	23,887	318	83,422	20,776	280,676	14.5
IV	45,900	10,229	35,955	1,087	91,290	16,607	201,068	14.3	118,320	40,169	24,863	332	86,828	21,620	292,132	15.1
V	17,000	16,470	7,500	2,315	30,500	38,002	111,787	8.0	60,000	12,511	1,500	475	57,500	7,135	139,121	7.2
VI	44,000	4,950	27,000	2,382	101,000	13,725	193,057	13.8	73,000	48,331	500	200	11,500	41,642	175,173	9.0
Total	530,000	55,210	185,000	9,559	523,500	96,960	1,400,229	100.0	1,065,250	193,649	163,500	5,587	369,750	142,546	1,940,282	100.0
	Percentages															
I	80.4	1.6	3.5	.4	13.5	.6	100.0		79.8	3.6	5.9	.2	8.0	2.5	100.0	
II	28.7	2.3	19.0	.4	46.6	3.0	100.0		49.6	7.1	16.8	.6	18.0	7.9	100.0	
III	22.8	5.1	17.9	.5	45.4	8.3	100.0		40.5	13.8	8.5	.1	29.7	7.4	100.0	
IV	22.8	5.1	17.9	.5	45.4	8.3	100.0		40.5	13.8	8.5	.1	29.7	7.4	100.0	
V	15.2	14.7	6.7	2.1	27.3	34.0	100.0		43.1	9.0	1.1	.4	41.3	5.1	100.0	
VI	22.8	2.6	14.0	1.2	52.3	7.1	100.0		41.6	27.6	.3	.1	6.6	23.8	100.0	
Per Cent of Total	37.9	3.9	13.2	.7	37.4	6.9	100.0		54.9	10.0	8.4	.3	19.1	7.3	100.0	

*Except September and October, 1936.
**Except July and August, 1937.

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