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Distribution of Vegetables from the Lower Rio Grande Valley

TEXAS AGRICULTURAL EXPERIMENT STATION

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SUMMARY

This study was conducted to determine the importance of mixed shipments of vegetables from the Lower Rio Grande Valley of Texas and the amount shipped to small markets.

The mixed carload has been important in lengthening the shipping season for vegetable growers in the Lower Rio Grande Valley. It has been particularly influential in increasing fall and winter shipments.

Most of the vegetables now grown in the Lower Rio Grande Valley have been introduced to the markets of the country through the mixed carloads. Such shipments reduce risks to shippers in marketing new vegetables. Small quantities may be shipped to many markets as against a few straight carloads to a limited number of markets. Growers in a vegetable-producing area will find the mixed carload most useful in accomplishing greater diversification.

Movements of some vegetables are not reported separately. Some crops of minor importance, such as anise, endive, mustard greens, dandelions and escarole, had from 20 to 80 straight carload equivalents moving in the mixed car but none as straight carloads.

Mixed cars are shipped from Texas to all crop-reporting regions of the United States and Canada, with the Central and North Central States and Eastern Canada leading in the number of shipments.

Specific mixed carloads are of greater importance in satisfying requirements for vegetables in small markets than in large, and carloads of many commodities filled according to F. O. B. order are of greater relative importance in shipments to small than to large markets.

CONTENTS

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VEGETABLE PRODUCTION in the Lower Rio Grande Valley of Texas attained commercial status during 1905-10. Growers in vegetable production in that area did not find a readymade marketing system. Instead, they had to resort largely to their own ingenuity in securing outlets for their produce. Individual express agents in nearby cities were the chief dispersers of marketing vegetables. Distribution through express shipments was expensive; freight charges on a carload of mixed vegetables are considerably less than express charges on an equivalent quantity of produce broken up into small express shipments. Many points reached by express are accessible to mixed carloads at a saving in cost of transportation. Increased vegetable production made it necessary to expand distribution facilities, which in turn made it imperative to resort to the mixed carload as a means of distribution. Carload shipments, in turn, were affected by motor-truck shipments, mainly in two spheres: markets within trucking distance of the producing area, and small markets within trucking distance of large cities. One of the main uses of truck shipments is to ship to several cities with the same load. The vegetables would be loaded to facilitate unloading in the order of stops at the various cities.

OBJECT OF STUDY AND SOURCE OF DATA

This study was conducted to determine the importance of mixed shipments of vegetables from the Lower Rio Grande Valley of Texas, including mixed truckloads and mixed rail cars; to determine the extent the small markets for mixed carloads has influenced production of various vegetables, mainly the specialty types; and to determine whether the growing and marketing season lengthened because of the use of mixed cars.

Data used in this study were obtained from records of local shippers in the valley for the four seasons, 1951-52 through 1954-55. These shippers accounted for approximately 80 percent of the total volume shipped. A random sample was drawn of 25 percent of the invoices of each shipper for each season. The chief sources of data and information used were: (1) the data secured from offices of various local shippers in the valley, (2) records on carload shipments from the Lower Rio Grande Valley, (3) data on unloads from 100 U. S. and 6 Canadian cities compiled by the Market News Service of the Department of Agriculture and (4) Texas Agricultural Experiment Station publications.[1]

VOLUME OF VEGETABLES SHIPPED

The first year of commercial production of vegetables in the Lower Rio Grande Valley was 1905. Since the introduction of mixed shipments

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[1]"Mixed Carload in Distribution of Vegetables from the Lower Rio Grande Valley of Texas," W. E. Paulson, Texas Agricultural Experiment Station Bulletin 497, November 1934.

"Mixed Carload Distribution from the Lower Rio Grande Valley of Texas, 1951-52 Season," H. B. Sorensen and W. E. Paulson, Texas Agricultural Experiment Station Progress Report 1616, September 1953.

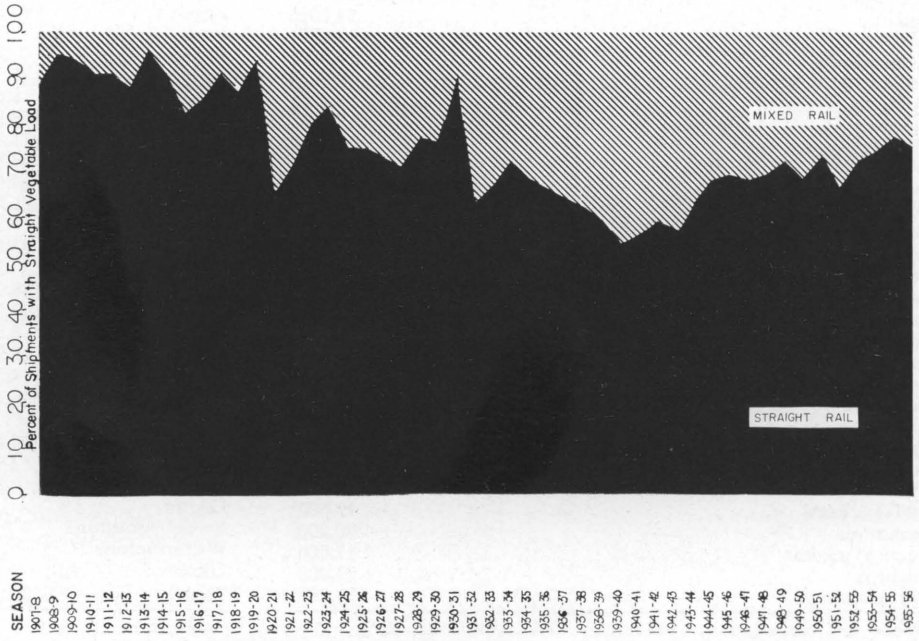


Figure 1. Distribution of total carlot shipments of vegetables, Lower Rio Grande Valley.

as early as 1907, the volume has increased. The relative importance of the mixed car shipment of vegetables from the Lower Rio Grande Valley is shown in Figure 1.

Mixed Load Shipments Reduced to Straight Load Equivalents (Minimum Weights)

The minimum carload weight varies by the type of vegetables. The minimum weights of various vegetables are shown in Table 1. The leafy vegetables and specialties, such as anise, greens, lettuce and the like, have a low minimum weight of 17,500 pounds per car. The slightly heavier vegetables, such as beans, okra, peas and shallots, have a minimum weight of 20,000 pounds per car. The minimum weight for root vegetables and other heavier vegetables is 24,000 pounds per car.

During 1931-55, 13 new vegetables have been added to the crops produced in the Lower Rio Grande Valley, Table 1. Vegetables assuming leading rank by total volume shipped are characterized by a long marketing season, heavy and stable demand, adaptability to mixing with other vegetables in the same load and marketing season coinciding with that of a number of other vegetables.

Table 2 shows the carload equivalent movements of vegetables from the Lower Rio Grande Valley for the seasons of 1952-53, 1953-54, and 1954-55. The most important commodity in terms of volume was carrots with 8,195 cars for the 3-year average. The other leading vegetables were cabbage with 5,056 cars; lettuce with 4,434; tomatoes with 3,880; and dry onions with 2,990. These five vegetables were included in all types of movements but varied as to the volume in straight truck. Lettuce had a small volume in mixed rail, a large volume in straight rail and mixed truck and a small volume in straight truck. Lettuce was of minor importance as a crop in 1926-31. During 1952-53, carrots had a large volume in mixed rail and straight rail and a smaller volume in mixed and straight truck. Onions and tomatoes were moved mainly by straight rail and straight truck; however, the movement of tomatoes was primarily by straight rail.

TABLE 1. MINIMUM CARLOAD WEIGHTS OF VARIOUS VEGETABLES

Vegetable	1951-55
Anise	17,500
Beans	20,000
Beets	24,000
Broccoli	17,500
Cabbage	24,000
Cantaloupes	24,000[1]
Carrots	24,000
Cauliflower	20,000
Chicory	17,500
Celery	20,000[1]
Collard	20,000
Corn	24,000
Cucumbers	20,000
Dandelion	17,500
Dill	17,500
Eggplant	17,500[1]
Endive	17,500
Escarole	17,500
Garlic	24,000[1]
Greens	17,500
Honeydews	24,000[1]
Kale	17,500
Kohlrabi	20,000
Lettuce	17,500
Mustard	17,500
Okra	20,000
Onions, dry	24,000
Onions, green	20,000
Parsley	17,500
Parsnips	24,000[1]
Peas, field	20,000[1]
Peas, green	20,000
Peppers	17,500
Potatoes	24,000
Radishes	24,000
Romaine	17,500
Root parsley	24,000[1]
Shallots	20,000
Spinach	17,500
Squash	17,500[1]
Sweet potatoes	24,000[1]
Swiss chard	17,500[1]
Tomatoes	20,000
Turnip greens	17,500
Turnips	24,000
Watermelons	24,000[1]

[1]Were not included in 1934 study (TAES Bulletin 497).

TABLE 2. CARLOAD EQUIVALENT MOVEMENT OF VEGETABLES FROM THE LOWER RIO GRANDE VALLEY, AVERAGES OF SEASONS, 1952-53, 1953-54 AND 1954-55

Commodity	Mixed rail	Straight rail	Mixed truck	Straight truck	Total
Cabbage	1743.4	1637.3	1379.0	296.5	5056.2
Lettuce	351.3	1815.2	1950.4	317.5	4434.4
Carrots	2280.5	3973.1	1133.6	808.1	8195.3
Beets	497.2	214.4	29.2	.5	741.3
Beans	.6		5.9		6.5
Broccoli	284.8	45.1	29.8	1.0	360.7
Cauliflower	33.1	46.1	28.5	.9	108.6
Cucumbers	3.5	1.5	24.0	2.1	31.1
Dandelions	10.1		.4		10.5
Eggplant	21.6		17.4	.1	39.1
Endive	68.8	1.5	17.0		87.3
Escarole	27.1		3.8		30.9
Onions, dry	40.8	1548.9	270.2	1130.1	2990.0
Onions, green	173.8	19.6	85.7	3.2	282.3
Parsley	195.6	30.0	30.0		255.6
Peas, field	.2		6.0	1.2	7.4
Peas, green	.2		.5		.7
Peppers	185.5	1093.9	117.8	97.4	1494.6
Potatoes	8.6	90.0	30.3	11.6	140.5
Radishes	118.9	24.7	73.8	2.2	219.6
Spinach	11.2	6.7	5.5		23.4
Squash	9.9		14.8	.1	24.8
Turnip greens	19.1		30.1	.2	49.4
Turnips	85.7	12.1	138.6	2.6	239.0
Anise	.1				.1
Cantaloupe	23.8	1914.2	70.7	107.4	2116.1
Chicory	.1				.1
Collard	28.1	24.8	18.8		71.7
Corn, green	103.6	1276.3	182.1	148.1	1710.1
Dill	9.0		.1		9.1
Greens	16.2	3.2	15.1	2.8	37.3
Kohlrabi	1.2	7.6	.3		9.1
Mustard	15.4	1.4	12.8	3.0	32.6
Romaine	.3		.2		.5
Root parsley	18.5	3.7	1.1		23.3
Tomatoes	2.4	3604.2	67.5	206.3	3880.4
Shallots	.1				.1
Garlic			[1]		[1]
Sweet potatoes			.1		.1
Watermelons			2.3		2.3
Okra			2.4	[1]	2.4
Total	6390.3	17395.5	5795.8	3142.9	32724.5

[1]Less than .1.

TABLE 3. COMPARISON OF RAIL AND TRUCK SCHEDULES SHOWING EXAMPLES OF NUMBER OF DESTINATIONS, VEGETABLES, CONTAINER CODES, POUNDS AND NUMBER OF CONTAINERS

Rail movement					Truck movement				
Date:	January 12				Date:	January 7			
Origin:	Weslaco				Origin:	Weslaco			
Destination:	Minneapolis, Minnesota				Destination:	Colorado Springs, Pueblo, Denver, Colorado			
Vegetable	Identity code	Container code	Pounds in carload	Number containers	Vegetable	Identity code	Container code	Pounds in carload	Number containers
Cabbage	01	935	2100	35	Beets	04	957	56	2
Cabbage, red	01	957	235	05	Broccoli	06	408	265	5
Cabbage	01	5102	5363	95	Cabbage	01	935	4500	75
Carrots	03	925	800	10	Cabbage, red	01	957	175	5
Carrots, cello	03	3820	10,500	175	Savoy	01	957	280	8
Carrots	03	7500	1,263	25	Carrots	03	935	2436	28
Parsley	16	1705	378	18	Carrots, cello	03	7500	505	10
Turnips	25	7500	152	03	Eggplant	10	8026	360	10
Radishes	21	4126	660	30	Endive	11	935	225	5
Spinach	22	8026	240	10	Onions, green	15	935	114	2
					Parsley	16	1705	63	3
					Peppers	19	3026	1360	40
					Turnips	25	935	700	10
					Turnips	25	7500	1262	25

In considering a mixed load, tomatoes and green corn have several features which are different from those of other vegetables. First, heavy shipments come late in the season after the movement of most other vegetables is about over. Thus, there are few vegetables to make up a mixed load. Second, tomatoes and green corn require different care in transit; for example, tomatoes require some ventilation and should not be cooled below 50 degrees F., while green corn needs refrigeration.

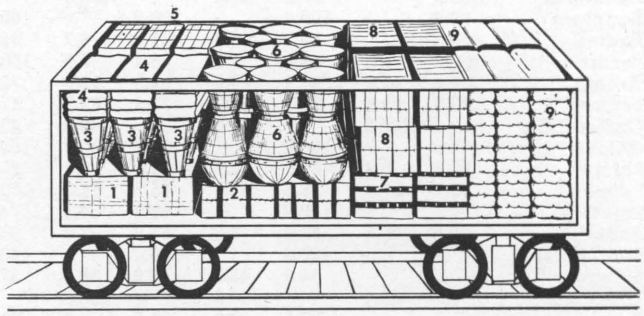
A large number of the vegetables move only in mixed carloads or with a very slight movement in straight rail or truck. Some of the vegetables that move only in mixed shipments include beans, dandelions, escarole, green peas, anise, chicory, shallots, sweet potatoes and okra.

A schedule for truck and rail shows the large number of vegetables in a load, Table 3. Three cities were marked as destinations in the truck schedule, indicating how the mixed load supplies small cities.

The complexity of a mixed car of vegetables arising from the use of a mixture of containers is shown in Figure 2. The various sized containers used for the shipped vegetables present difficulties in loading, especially when the container is not designed to fit the vehicle in which it is shipped. The method of loading a mixed car is erratic because it must be loaded so that each vegetable can be unloaded in a specific order. If a mixed load is to be unloaded at several locations, the problem of proper loading becomes particularly acute.

Increased Production Period and Introduction of New Crops

The mixed car helps popularize a new crop by providing a means of distributing a small volume until it has been accepted by the trade. If it were not for the mixed car, some of the vegetables produced in the Lower Rio Grande Valley would not be shipped out because of lack of volume. When new vegetables are introduced, shipments occur first in mixed loads followed later by shipments in straight loads. Diversification of vegetable plantings in the Lower Rio Grande Valley has been encouraged and facilitated by mixed load shipments. The introduction of new vegetables usually involves risk both as to their adaptability to soil and climatic conditions and to market outlets. The mixed car often is used to move vegetables at the beginning and end of a produc-



(1) Lettuce—crates (flat bottom)
(2) Carrots—wirebound
(3) Beans—hamper
(4) Corn—bags
(5) Radishes—lugs
(6) Mustard—crates (round bottom)
(7) Cucumber—lugs
(8) Onions—wirebound
(9) Cabbage—bags

Figure 2. Artist drawing of the loading arrangement of a mixed car.

Figure 3. A comparison of vegetable production seasons with changes for 1926-31 and 1952-55.

tion season when the volume available at the shipping point is not sufficient to load a straight car.

Two important factors influencing the volume of perishables which growers can produce for market are the length of the shipping season and the daily volume which markets will absorb. Diversified plantings of vegetables in the Lower Rio Grande Valley have increased both the length of the shipping season and the daily volume which markets can absorb.

A comparison of shipping seasons for 1926-31 and 1952-55 is shown in Figure 3. This figure reveals changes in the diversification in the vegetable plantings of the Lower Rio Grande Valley. The production season has been extended in some instances and in others it has been divided to allow for weather. The distribution for production of vegetables by various months is shown in Table 4.

Number of Vegetables per Car or Truck

The number of vegetables shipped in each type of movement by seasons is listed in Table 5. In 1952-53, a total of 37 different vegetables was shipped. Thirty-four of these vegetables were in mixed rail, 30 in mixed, only 13 in straight rail and 10 in straight truck. Thus a large number of vegetables are shipped only in a mixed type movement. Occasionally fruit is included in the mixed vegetable load.

Number of Vegetables in Mixed Loads

When considering the distribution of vegetables in a carload by percentage of the load, it is evident that the vegetables with small volume of production are shipped in small quantities in a number of cars. Some vegetables may be thought of as "fillers," that is, vegetables that are used to fill up the car after the desired special crops have been loaded. They have a good distribution percentage throughout the load,

TABLE 4. PERCENT OF TOTAL RAIL MOVEMENT BY MIXED CARLOTS AND STRAIGHT CARLOTS, 1953-54 AND 1954-55

Vegetable[1]	November		December		January		February		March		April		May		June	
	M.[2]	St.[3]	M.	St.	M.	St.	M.	St.	M.	St.	M.	St.	M.	St.	M.	St.
	Percent															
Beans	60.0	40.0														
Beets	86.8	13.2	92.4	7.6	95.3	4.7	93.5	6.5	91.8	8.2	88.7	11.3	78.0	22.0		100.0
Broccoli	94.3	5.7	95.9	4.1	91.2	8.8	97.9	2.1			100.0					
Cabbage	68.7	31.3	64.2	35.8	64.0	36.0	66.3	33.7	76.4	23.6	66.9	33.1	100.0			100.0
Cantaloupe			100.0		100.0		100.0				52.6	47.4	3.6	96.4	1.4	98.6
Carrots	85.5	14.5	67.3	32.7	63.0	37.0	64.9	35.1	62.1	37.9	55.2	44.8	30.4	69.6	3.5	96.5
Cauliflower		100.0	15.3	84.7	44.8	55.2	54.2	45.8								
Corn	61.8	38.2	74.8	25.2	100.0				100.0		57.7	42.3	38.2	61.8	20.0	80.0
Cucumber	100.0		50.0	50.0		100.0		100.0			100.0		100.0			
Eggplant	98.9	1.1	100.0		100.0		100.0									
Endive	100.0		93.1	6.9	91.3	8.7	95.5	4.5	100.0							
Escarole	100.0		95.8	4.2	96.4	3.6	100.0		100.0							
Greens	52.4	47.6	84.4	15.6	84.5	15.5	72.0	28.0	100.0							
Lettuce	20.6	79.4	24.1	75.9	37.5	62.5	47.0	53.0	28.3	71.7		100.0				
Onions, dry		100.0		100.0		100.0	43.5	56.5	9.2	90.8	8.3	91.7	23.5	76.5		100.0
Onions, green	100.0		100.0		99.7	.3	100.0		99.5	.5	79.2	20.8	100.0			
Parsley	90.6	9.4	89.5	10.5	84.6	15.4	86.1	13.9	85.2	14.8	79.9	20.1	77.9	22.1		100.0
Peppers	32.9	67.1	48.5	51.5	75.7	24.3	100.0		100.0		100.0			100.0	16.7	83.3
Potatoes			100.0		60.9	39.1	74.1	56.5	9.2	90.8	8.3	91.7	23.5	76.5		100.0
Radishes	69.9	30.1	92.0	8.0	97.0	3.0	98.8	1.2	95.4	4.6	100.0					
Root parsley			100.0		100.0		100.0		100.0		88.2	11.8	100.0			
Spinach			54.3	45.7	60.9	39.1	57.1	42.9	100.0							
Tomatoes	1.6	98.4		100.0		100.0		100.0			1.3	98.7	.2	99.8		100.0
Turnips	100.0		97.1	2.9	97.5	2.5	98.1	1.9	92.2	7.8		100.0				

[1]Vegetables shipped only in mixed car—anise, collards, chicory, dandelion, dill, mustard, Southern peas, English peas, Romaine, turnip greens, shallots and kohlrabi.
Vegetables shipped only in straight car—honeydew, sweet potatoes, squash and watermelons.
[2]M.—Mixed carlots.
[3]St.—Straight carlots.

TABLE 5. NUMBER OF VEGETABLES SHIPPED IN MIXED AND STRAIGHT CARLOADS[1]

Year	Mixed rail	Straight rail	Mixed truck	Straight truck	Total
1951-52	35				35
1952-53	34	13	30	10	37
1953-54	33	18	34	20	36
1954-55	31	21	39	17	39

[1]Records cover mixed rail data only.

ranging from 8 to 11 percent for each 10 percent increase in size of load.

Table 6 lists the number of kinds of vegetables shipped in mixed and straight carloads for earlier periods, giving the least number and the greatest number shipped by mixed and straight for any single year. In 1910-11 and 1915-16 the least number shipped mixed in any year was 6 and the greatest was 9; during 1951-52 the least number shipped mixed was 31 and the least straight 13 while the greatest number shipped mixed was 35 and the greatest straight was 21. The development of the vegetable industry is shown by comparison of the data by periods in Table 6.

DISTRIBUTION OF VEGETABLES FROM THE LOWER RIO GRANDE VALLEY

In general, carload lot freight rates on 100 pounds from points in the Lower Rio Grande Valley to various points in the United States vary according to minimum weights. (Minimum weights for carloads of the various vegetables are shown in Table 1.)

Loading a carload with mixed vegetables having the same freight rates and minimum weight causes no complications from the standpoint of rates and minimum weights. When vegetables having different rates and minimum weights are mixed, minimum weights and rates must be adjusted.

During the early years of mixed carload shipments from the Lower Rio Grande Valley, no differences were made as to rates on vegetables, whether in straight or mixed carloads. Most of the vegetables were shipped to markets within Texas.

TABLE 6. NUMBER OF KINDS OF VEGETABLES SHIPPED IN MIXED AND STRAIGHT CARLOADS

Periods	Least number any year		Greatest number any year		Total number	
	Mixed	Straight	Mixed	Straight	Mixed	Straight
1910-11 to 1915-16	6	3	9	5	17	5
1916-17 to 1920-21	6	4	15	7	19	8
1921-22 to 1925-26	19	11	20	13	25	13
1926-27 to 1930-31	23	22	36	25	39	31
1951-52 to 1954-55	31	13	35	21	39	21

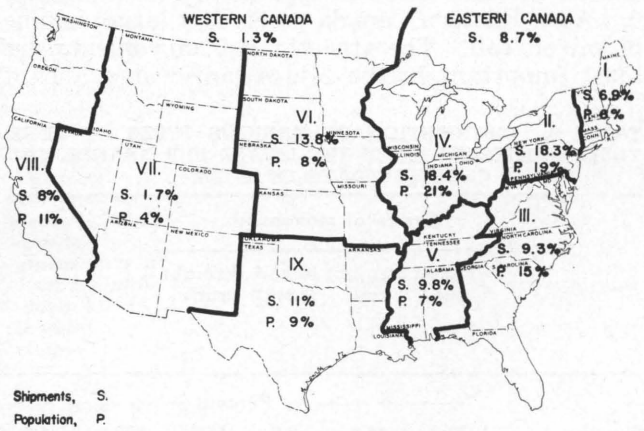
TABLE 7. DISTRIBUTION OF VARIOUS TYPES OF SHIPMENTS OF VEGETABLES FROM THE LOWER RIO GRANDE VALLEY TO THE 11 REGIONS OF THE UNITED STATES AND CANADA

Regions	Types of shipments to each region				Total	Percent of shipments received by regions
	Mixed rail[1]	Straight rail[2]	Mixed truck[2]	Straight truck[2]		
	Percent					
New England	20.8	78.6		.6	100	6.9
Middle Atlantic	18.7	78.8	[3]	2.5	100	18.3
South Atlantic	20.9	38.1	11.1	29.9	100	9.3
East North Central	27.3	54.4	9.4	8.9	100	18.4
West North Central	14.1	51.1	23.7	10.6	100	13.8
East South Central	18.6	39.3	30.1	12.0	100	9.8
West South Central	10.8	45.0	29.9	14.3	100	11.0
Mountain	9.6	16.7	61.2	12.5	100	1.7
Pacific	1.	55.8	1.0	42.2	100	.8
Western Canada	40.5	59.3		.2	100	1.3
Eastern Canada	33.7	65.8	.2	.3	100	8.7
Total						100.0

[1]Four-year average: 1951-52; 1952-53; 1953-54; 1954-55.
[2]Three-year average: 1952-53; 1953-54; 1954-55.
[3]Less than .05.

Average of all Types of Movements and Totals by Regions

The most popular markets for Texas mixed vegetable carloads are the Central and North Central States and Eastern Canada. Some vegetables are in greater demand in certain regions than in others. The 3-year average for 9 regions plus Canada shows the percent of volume for various types of movements that were received from the Lower Rio Grande Valley and the percent of



KEY TO LOCATIONS ON MAP

I. New England
II. Middle Atlantic
III. East North Central
IV. West North Central
V. South Atlantic
VI. East South Central
VII. West South Central
VIII. Mountain
IX. Pacific

S.—Shipments
P.—Populations

Figure 4. Distribution of U. S. population and percentage of vegetables from the Lower Rio Grande Valley received by the nine crop-reporting regions of the United States and two regions of Canada.

TABLE 8. DISTRIBUTION OF VARIOUS TYPES OF SHIPMENTS OF VEGETABLES FROM LOWER RIO GRANDE VALLEY TO VARIOUS SIZES OF CITIES IN UNITED STATES AND CANADA

Size of city (population)	Types of movement to each size city: Mixed rail[1]	Straight rail[2]	Mixed truck[2]	Straight truck[2]	Total movement	Percent of shipments received by size of city
	— — — — — — Percent — — — — — —					
0-24,999	27.6	33.8	28	10.5	100	7.8
25,000-49,999	45.5	18.6	28.2	7.7	100	5.1
50,000-74,999	32.5	2.6	43.9	21	100	2.1
75,000-99,999	31.2	3.5	43.8	21.5	100	3.1
100,000-199,999	30.7	7.2	38.7	23.4	100	9.8
200,000-299,999	36.6	6.7	23.8	32.9	100	4.3
300,000-399,999	14.5	48.7	17.1	19.7	100	6.7
400,000-499,999	29.6	7.2	37.9	25.3	100	4.1
500,000-749,999	20.5	68.3	5.0	6.2	100	14.2
750,000-999,999	19.9	70.9	3.7	5.5	100	20.2
1,000,000 and over	12.9	80.2	2.3	4.6	100	22.6
Total						100.0

[1]Four-year average: 1951-52; 1952-53; 1953-54; 1954-55.
[2]Three-year average: 1952-53; 1953-54; 1954-55.
[3]Less than .05.

total shipments into the area, Table 7. The Mid-Atlantic area and the East North Central area were the primary receiving areas of Texas vegetables. The Pacific area, the Western Canada area and the Mountain area received the least volume of Texas vegetables. The West Coast Pacific region receives its vegetables from California, which is the most competitive area for Texas in that region. Thus, areas of competition such as California and Florida are big factors in determining why the volume of Texas shipments is low in each. The mixed rail shipments were most important in the East North Central area and in the Mid-Atlantic area as shown in Figure 4. Also, Eastern Canada received a large volume of mixed rail. The straight rail movements are most important in the Mid-Atlantic area and of

TABLE 9. DISTRIBUTION OF VARIOUS TYPES OF VEGETABLE SHIPMENTS FROM THE LOWER RIO GRANDE VALLEY BY DAYS OF WEEK

Day of week	Types of movement: Mixed rail[1]	Straight rail[2]	Mixed truck[2]	Straight truck[2]	Total	Percent of shipments for each day of week
	— — — — — — Percent — — — — — —					
Sunday	23.0	48.9	2.6	25.5	100	4.6
Monday	22.7	47.7	17.8	11.8	100	12.6
Tuesday	14.4	58.8	16.0	10.8	100	17.2
Wednesday	19.1	59.9	11.5	9.5	100	17.5
Thusday	21.8	57.8	10.8	9.6	100	16.8
Friday	21.4	58.4	13.0	7.2	100	16.4
Saturday	19.3	54.7	17.9	8.1	100	14.9
Total						100.0

[1]Four-year average: 1951-52; 1952-53; 1953-54; 1954-55.
[2]Three-year average: 1952-53; 1953-54; 1954-55.

next importance in the East North Central area. Again, the areas of least importance on straight rail were the mountain areas, Pacific area and Central and West Central areas. It was of least importance in New England and Western Canada, the Mid-Atlantic and Pacific areas. The straight truck movement was most important in the South Atlantic area and the East North Central. Western Canada and New England were of least importance.

Average of All Movements and Totals by Size of City

The mixed car gives the smaller centers of population an opportunity to receive a portion of the specialty crops which they would be unable to obtain if they were forced to buy an entire carload. The 3-year average of movement by size of city and by type of movement is shown in Table 8. The cities of 750,000 to 1,000,000 and those of 1,000,000 and over were the most im-

TABLE 10. STRAIGHT CARLOAD EQUIVALENTS OF VARIOUS VEGETABLES SHIPPED IN MIXED CARLOADS FROM THE LOWER RIO GRANDE VALLEY, 1926-31 AND 1951-55

Commodity	Percent of total 1926-31	Percent of total 1951-55
Anise	.2	[1]
Beans	.5	[1]
Beets	11.0	8.2
Broccoli	.9	4.6
Cabbage	27.9	28.1
Cantaloupes	[1]	.3
Carrots	27.5	33.9
Cauliflower	.2	.4
Chicory	[1]	[1]
Celery	[1]	[1]
Collards	.1	.5
Corn	1.1	1.3
Cucumber	.3	.1
Dandelion	.1	.2
Dill	[1]	.1
Eggplant	.6	.3
Endive	[1]	1.1
Escarole	[1]	.4
Greens	[1]	.2
Garlic	[1]	[1]
Kale	[1]	[1]
Kohlrabi	[1]	.1
Lettuce	[1]	5.5
Mustard	1.4	.4
Okra	[1]	[1]
Onions, dry	2.5	.6
Onions, green	[1]	2.4
Parsley	.9	3.4
Peas, field	.4	[1]
Peas, green	[1]	[1]
Peppers	.5	2.5
Potatoes	9.1	.1
Radishes	.4	1.7
Root parsley	[1]	.3
Romaine	[1]	[1]
Shallots	.1	[1]
Spinach	3.0	.3
Squash	1.0	.1
Sweet potatoes	[1]	[1]
Swiss chard	[1]	[1]
Tomatoes	2.2	[1]
Turnips	4.4	2.4
Turnip greens	.8	.4
Watermelon	[1]	[1]

[1]Less than .1.

portant two groups in terms of total receipts. The cities of 50,000 to 75,000 and those of 75,000 to 100,000 were of the least importance. In terms of the type of movement, the larger cities, those over 500,000, received mainly by straight rail, closely followed by straight truck; however, there was a significant volume of mixed rail and truck. In the smaller cities, less than 25,000, the straight rail, mixed truck and mixed rail were important, in that order, with only slight variations in percentage movement. Mixed loads have helped to expand the outlets for staple vegetables in the small markets and for specialty vegetables in the large markets. Small markets receive mixed loads of the various vegetables. Large markets receive mixed loads for various reasons: (1) small cities can handle mixed loads of specialty crops, (2) more frequent loadings insure greater freshness, (3) mixed loads give variety of vegetables and quantity to the receiver and (4) mixed loads give the shipper an opportunity to load the produce in the order it is received from the field.

In cities of 50,000 to 75,000 and those of 75,000 to 100,000, mixed movements have a very substantial lead over straight movements.

All Movements and Totals by Day of Week

Mixed cars are loaded every day of the week with variations due mainly to the arrival time for unloading the cars and distribution at the receiving point. The volume of shipment by day of week for the 4-year average is shown in Table 9. In terms of total shipment, the most important shipping days were Tuesday, Wednesday, Thursday and Friday. The least shipments were made on Sunday. The volume of shipment by the day of week was very closely related to the market to which the shipment was bound and to the length of time required for transit to that market. For instance, if it takes 2 days for the produce to go from Texas to the market, the shipment is so scheduled that the produce will arrive on the day it will be needed. If a special shipment is being purchased for a special sale at that market on the weekend, it will take 2 days and will be shipped on Tuesday morning to go to sale Thursday afternoon.

TABLE 11. SHIPMENTS IN STRAIGHT CARLOADS OF VEGETABLES FROM LOWER RIO GRANDE VALLEY, SEASONS 1926-31 AND 1951-55

Commodity	Percent of total 1926-31	Percent of total 1951-55
Beans	2.8	
Beets	5.5	1.2
Broccoli	.2	.3
Cabbage	40.2	9.4
Cantaloupes		11.0
Carrots	11.2	22.9
Cauliflower		.3
Collards		.1
Corn, green	7.0	7.3
Cucumbers		[1]
Endive		[1]
Greens		[1]
Kohlrabi		[1]
Lettuce		10.4
Mustard		[1]
Onions, dry		8.9
Onions, green	2.9	.1
Parsley	1.0	.2
Peppers		6.3
Potatoes	13.8	.5
Radishes		.1
Root parsley		[1]
Spinach	.8	[1]
Tomatoes	13.7	20.7
Turnips	.7	[1]
Turnip greens	.2	

[1]Less than .1.

COMPARISON BETWEEN 1926-31 AND 1951-55 SEASONS

The percentage of total volume that various vegetables are of the total volume shipped for the period 1926-31 and 1951-55 is shown in Table 10. Beets have decreased in importance while cabbage and carrots have remained about the

TABLE 12. CARLOAD MOVEMENTS OF MIXED VEGETABLES AND STRAIGHT CARLOADS FROM THE LOWER RIO GRANDE VALLEY, SEASONS, 1926-31 AND 1951-55

Commodity	Percentage given commodity is of straight carload equivalents of mixed carload shipments 1926-31	1951-55
Cabbage	27.9	28.1
Carrots	25.6	34.0
Beets	11.3	8.2
Turnips	4.4	2.4
Lettuce		5.5
Broccoli	.9	4.6
Parsley	9.9	3.4
Onions, green	2.5	2.4
Radishes	.4	1.7
Peppers	.5	2.5
Endive		1.1
Collards		.5
Mustard greens	1.4	.4
Turnip greens	.8	.4
Spinach	3.0	.3
Root Parsley		.3
Dandelions		.2
Escarole		.4
Kohlrabi		.1
Onions, dry		.5
Corn, green	1.1	1.3
Dill		.1
Eggplant	.6	.3
Cauliflower		.4
Potatoes	9.0	.1
Greens, mixed		.2
Squash	1.0	.1
Cucumbers	.3	.1
Tomatoes	2.2	[1]
Sweet potatoes		[1]
Peas, field		[1]
Peas, green	.4	[1]
Anise		[1]
Beans	4.8	[1]
Okra		[1]
Cantaloupe		[1]
Romaine		.3
Chicory		[1]
Shallots		[1]
Miscellaneous	1.0	

[1]Less than .1.

same. Lettuce has had a tremendous increase in importance. Potatoes have decreased quite significantly. Several vegetables which do not lend themselves to mixed shipments are cantaloupes, tomatoes, sweet potatoes and dry onions, Table 10. Most of the other commodities which were shipped in a large number of the cars include carrots, beets, cabbage, turnips and parsley. There have been some changes during the various periods. Lettuce which was not shipped to any great extent in the earlier period was quite significant in the later period. Also, endive and collards shipments have increased in volume. Root parsley, dandelions, escarole and kohlrabi have been introduced since the earlier study was made. Table 11 gives a shipment in straight carloads for the two periods. In the earlier period cabbage was the most important straight load shipment, with potatoes, carrots and tomatoes following in that order. In the later period the most important was carrots, with tomatoes, cantaloupes and lettuce following in that order. Items to be stressed throughout the analysis in this case were the introduction of new vegetables, the decrease in production of other vegetables and the reasons why various vegetables cannot be shipped in the same car. Table 12 gives the percentage of straight carload and mixed carload shipments in the various periods. In 1926-31, cabbage was by far the most important with 27.9 percent. Carrots with 25.6 percent were of next importance. Beets with 11.3 and potatoes with 9.0 were next. In the later period, 1951-55, carrots were the most important with 34.0 percent total shipments and cabbage was second with 28.1 percent. Beets had dropped to 8.2 percent but were still in third place. Potatoes had dropped down to .1 percent. Nineteen vegetables that were not listed in the 1931 study were listed as having some volume in 1955. Table 12 also gives the carload movements of mixed vegetables and straight carloads from the Lower Rio Grande Valley for the two comparative periods.

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SUPPLEMENTARY TABLES AVAILABLE

Data supporting the material reported in this publication are available in mimeographed tables for the four crop seasons covered in this report. Copies of these tables may be obtained from the Department of Agricultural Economics and Sociology, Texas A&M College, College Station, Texas.

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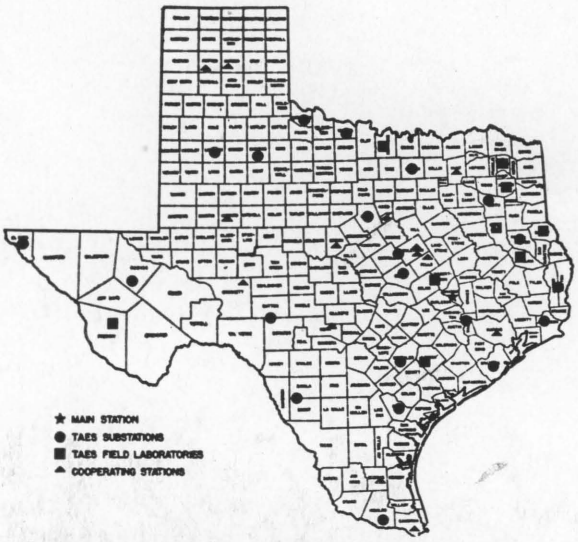

Location of field research units of the Texas Agricultural Experiment Station and cooperating agencies

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