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DIVISION OF FARM AND RANCH ECONOMICS

**The Mixed Carload in Distribution of  
Vegetables from the Lower Rio  
Grande Valley of Texas**



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†As of October 1, 1934

In their efforts to diversify plantings, vegetable growers in the Lower Rio Grande Valley have been greatly aided by the mixed carload, since it facilitates shipments of new vegetables to the markets of the United States and Canada. Furthermore, after the production of a wide variety of vegetables had been established, the mixed carload offered and continues to offer the means of shipping them to market. The mixed carload has been a factor in lengthening the marketing season for these growers. It has been particularly influential in increasing fall and winter shipments.

No division can be made on the basis of size between what may be termed mixed carload and straight carload markets. Mixed carload shipments are becoming increasingly popular in the larger cities. As to per capita receipts, mixed carloads are much more important in small markets than in large. Mixed carloads have expanded the outlet for staple vegetables in the small markets and for specialty vegetables in the large markets.

Small markets receive mixed carloads because their capacity is too small to accept straight carloads of the various vegetables. Large markets receive mixed carloads for numerous reasons: the *straight carload may be too large a unit for the various specialty vegetables*; more frequent receipts in the mixed carload insure greater freshness; the jobber wishing to play the role of receiver finds the mixed carload suited to his purposes both as to variety of vegetables and quantities; and the mixed carload aids the carlot receiver to assemble a greater variety in a smaller number of carloads than is possible through straight carloads.

In satisfying requirements for vegetables, specific mixed carloads are of greater importance in small markets than in large and carloads filled according to F. O. B. order and running to many commodities are relatively of greater significance in shipments to these markets. Mixed carloads filled without reference to specific orders and consigned, of course, find their freest outlet in the larger markets.

The chief outlet for mixed carloads from the Lower Rio Grande Valley, in early years, was to cities in Texas and surrounding states. Today, these markets are supplied largely through motor truck shipments. The main outlet for mixed carloads, today, is to the larger cities, on the one hand, and to the smaller cities, on the other hand, too distant for motor truck shipments either from the area of production or from the larger distributing centers.

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## THE MIXED CARLOAD IN DISTRIBUTION OF VEGETABLES FROM THE LOWER RIO GRANDE VALLEY OF TEXAS

W. E. PAULSON\*

Commercial vegetable production in the Lower Rio Grande Valley of Texas has developed during the past twenty-five years. Growers pioneering in vegetable production in that area did not find a ready-made marketing system. Instead, they had to resort largely to their own ingenuity in finding outlets for their produce. Individual express shipments consigned to commission merchants and retailers, and even to local express agents, in nearby cities, represented the chief manner of marketing in the early stages. Distribution through express shipments is expensive and can be supported only by payment of high prices on the part of the consumer. Freight charges on a carload of mixed vegetables would be considerably less than express charges on an equivalent quantity of produce broken up into a great number of small express shipments. Points reached by express would be accessible to mixed carloads at a saving in cost of transportation; an outlay equivalent to that on express shipments would carry mixed carloads to much more distant markets. Increasing production necessitating lower prices to consumers and wider distribution made imperative a turning of attention to the mixed carload as a means of distribution. Furthermore, individual express shipments lead to more or less blind consigning with consequent gluts and famines. The specialized shipping agency required to handle mixed carloads would stand a much better chance of gaining accurate and timely information regarding market conditions than the grower-shipper. The mixed carload directed to a glutted market can quite easily be reconsigned to some other more favorable market; whereas express shipments are, virtually, not open to reconsignments. From an unimportant and unimpressive role in the distribution of vegetables a few years ago, the mixed carload has now attained such proportions as to justify an evaluation of its significance.

### OBJECT OF STUDY AND SOURCE OF DATA

The object of this study is that of determining the importance of the mixed carload in the distribution of vegetables produced in the Lower Rio Grande Valley. More specifically, it seeks to ascertain the influence of the mixed carload upon demand for vegetables to the extent that such shipments open the small markets to carload shipments, facilitate movement to the large markets, make easier the marketing of specialty vegetables, lengthen the marketing period, and offer a means of reaching the

\*I wish to acknowledge my indebtedness to the following shippers for their helpful cooperation in making available their complete records on mixed carload shipments: Alexander Marketing Company, San Benito; Gulf Vegetable and Fruit Company, Inc., Weslaco; McDavitt Brothers, Brownsville; and Wade and Newton, San Benito.

market with new vegetables and thus encourage the growing and marketing of a greater diversity of produce.

The chief sources of data and information used in this study were as follows:

1. Data secured from records on vegetable shipments of local shippers.
2. Records on carload shipments from the Lower Rio Grande Valley and data on unloads in sixty-six cities, compiled by the Market News Service of the United States Department of Agriculture.
3. Records on carload shipments compiled by the two railroad companies serving the Lower Rio Grande Valley.
4. Personal interviews with local shippers and growers.
5. The files of such local newspapers as the San Benito Light, the Mercedes Tribune, the Mercedes News, the Brownsville Herald, and the Edinburg Valley Review.

### DEVELOPMENT OF MIXED CARLOAD SHIPMENTS

Yearly shipments of mixed and straight carloads of vegetables from the Lower Rio Grande Valley are shown in Figure 1. The relative importance of mixed and straight carload shipments is shown in Figure 2.

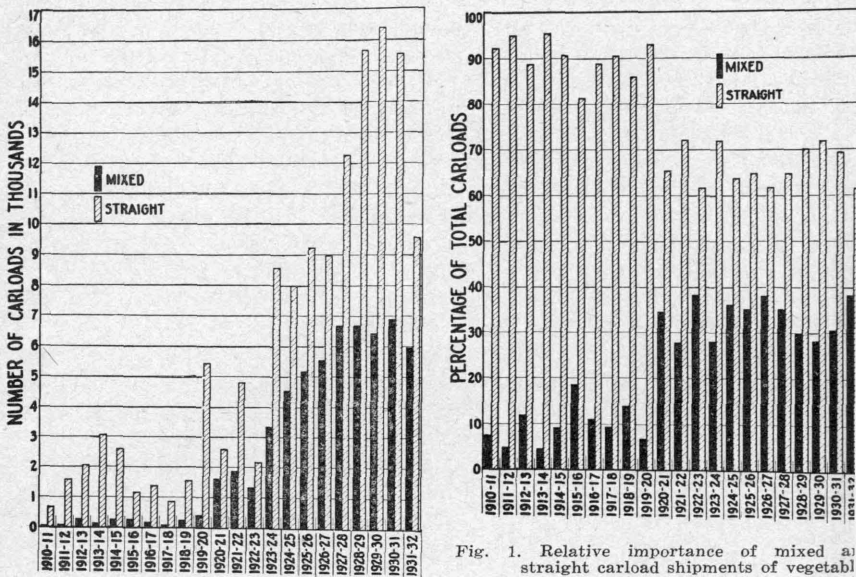


Fig. 1. Number of mixed and straight carloads of vegetables shipped from the Lower Rio Grande Valley by shipping seasons.

During the periods 1910-11 to 1915-16, 1916-17 to 1920-21, and 1921-22 to 1925-26, mixed carloads constituted 8.9, 16.2, and 33.0 per cent, respectively, of total shipments. During the period 1926-27 to 1930-31, mixed carloads declined to 31.9 per cent, a drop of 1.1 per cent from the figure of the preceding period. This loss in relative importance of mixed carloads can largely be accounted for by two developments of recent years. In

the first place, movement of vegetables by motor truck out of the Lower Rio Grande Valley has increased decidedly during the past few years. The markets within reach of motor trucks are relatively more important outlets for mixed carloads than for straight. Thus the motor truck movement has replaced a larger proportion of mixed carloads than straight. In the second place, a marked increase in carload shipments of tomatoes and green corn has occurred in recent years. These commodities are of negligible significance in mixed carload shipments. If shipments of tomatoes and green corn be eliminated from both mixed and straight carload totals for the last two periods, the relative importance of mixed carloads of the total increased by 1.4 per cent during the period 1926-27 to 1930-31, as compared with the preceding period.

An appreciation of the advantages of mixed carload shipments did not have the immediate effect of greatly increasing that type of movement. In the early period, growers made but slow progress in the direction of diversified plantings of vegetables necessary to support mixed carload shipments. Furthermore, a transition from small-lot express to mixed carload shipments is not easily accomplished. Growers who have developed their own express outlets are usually reluctant to give up this method of marketing. The mixed carload had to await the development of specialized marketing agencies—the carload shipper at point of origin and the carload receiver at point of destination.

### THE MIXED CARLOAD AS A MEANS OF DISTRIBUTING VEGETABLES

A determination of the kind and quantity of vegetables shipped in mixed carloads is of fundamental importance in analyzing the role of the mixed carload in distribution. This aspect of the study could best be attained through the analysis of sample data. A representative sample must include carloads shipped:

1. From all, or a large proportion of all local shipping points;
2. During the entire shipping season;
3. To representative markets, both as to size and geographical location;
4. Under the various types of sale, principally F. O. B. and consignment.

Such a sample was obtained through the cooperation of four shippers in the Lower Rio Grande Valley.

#### Mixed Carload Shipments Reduced to Straight Carload Equivalents

The carload is the accepted unit of data relating to vegetable shipments. For this reason, the content of mixed carloads may most conveniently be expressed in terms of straight carload equivalents. The general procedure followed in arriving at the straight carload equivalents of the various kinds of vegetables in mixed carloads was as follows: for the period 1910-11 to 1925-26, tabulations were made, by shipping year, of the various kinds of vegetables, by shipping unit, contained in the sample carloads. Such totals were then reduced to straight carload equivalents

by dividing them by the number of units, or volume, of such commodities in a straight carload. (The weight of a bushel and a Los Angeles crate of the various vegetables, the number of bushels and crates in a carload, and the minimum weight of a carload are shown in Table 1). After the straight carload equivalents of all vegetables in the sample had been

Table 1. Weights of standard containers, usual number of containers to the carload, and minimum weight of carloads.

Commodity	Weight in pounds <sup>1</sup>		Usual number of containers in a carload <sup>2</sup>						Minimum weights (pounds)
	Bu.	Los Angeles crate	Bu.	Los Angeles crate	One-half Los Angeles	100-pound sacks	50-pound sacks	Miscellaneous	
Anise	40	65	440	270					17,500
Beans, snap	35	82	575	250					20,000
Beets	55 <sup>3</sup>	76	476	368	640				24,000
Broccoli	25	58	700		640				17,500
Cabbage	50	85		320		250	500	12.57 <sup>6</sup>	24,000
Carrots	55 <sup>3</sup>	70	476	368	640				24,000
Cauliflower	37	42 <sup>7</sup>	540	500 <sup>1</sup>					20,000
Chickory	25	55	700	320					17,500
Collards	25	58	800	345					20,000
Corn	55	72	500						24,000
Cucumbers	52		415						20,000
Dandelion	25	55	700	320					17,500
Egg Plant	36	81	550	250					20,000
Endive	25	45	700	390					17,500
Escarole	25	45	700	390					17,500
Kale	25	59	700	300					17,500
Kohlrabi	45	69	450	290					20,000
Lettuce	25	55	700	390					17,500
Mustard	25	45	700	390					17,500
Okra	38		530						20,000
Onions, dry	56					250	500	560 <sup>8</sup>	24,000
Onions, green	38	57	530	355					20,000
Parsley	21	55	846	320					17,500
Peas, English	33	52	600	330					20,000
Peppers	28	45 <sup>9</sup>	660	400 <sup>9</sup>					17,500
Potatoes	56					250	500		24,000
Radishes	35	71	770	368	640				24,000
Romaine	25	56	700	320					17,500
Shallots	22	53	800	330					20,000
Spinach	20	54	828	390					17,500
Squash	48		420						20,000
Tomatoes	33 <sup>4</sup>	23 <sup>5</sup>	660 <sup>4</sup>	896 <sup>5</sup>					20,000
Turnip Greens	25	55	700	320					17,500
Turnips	50 <sup>3</sup>	70	520	368	640				24,000

<sup>1</sup>Data furnished by Missouri Pacific Lines.

<sup>2</sup>Data chiefly from mimeographed report, "Table of Number of Packages per Carload", Bureau of Agricultural Economics, January, 1933.

<sup>3</sup>Without tops.

<sup>4</sup>Lugs.

<sup>5</sup>Mississippi crates.

<sup>6</sup>Tons, bulk.

<sup>7</sup>Cauliflower crates.

<sup>8</sup>Onion crates.

<sup>9</sup>Pepper crates.



determined for a given season, the percentage that the volume of each vegetable was of the total carloads in the sample was computed. These percentages were then applied to the total number of mixed carloads shipped during that season.

For the period 1926-27 to 1930-31, the sample being much larger absolutely and relatively, was sorted not only according to shipping season, but also according to week of shipment and size of city to which shipped. The straight carload equivalents of the sample for the weekly period and according to size of market were then determined and the volume of each vegetable expressed in percentage of the total in the sample. The percentages the various vegetables constituted of the weekly sample were then applied to the total mixed carload movement for the corresponding week and destinations. Straight carload equivalents of the vegetables shipped in mixed carloads from the Lower Rio Grande Valley during the twenty-one shipping seasons, 1910-11 to 1930-31, are shown in Table 2. Straight carload shipments for the same period are shown in Table 3.

**Mixed Carload Shipments Have Expanded Markets for Vegetables**

Average weekly shipments, by periods, of mixed carloads from the Lower Rio Grande Valley are shown in Figure 3. It is manifest that the expansion in volume of vegetables finding outlet through the mixed carloads has been brought about in two ways: the number of weeks during

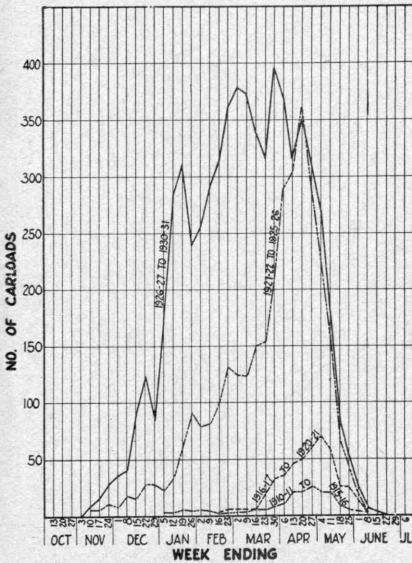


Fig. 3. Weekly shipments of mixed carloads of vegetables from the Lower Rio Grande Valley. Averages for periods.

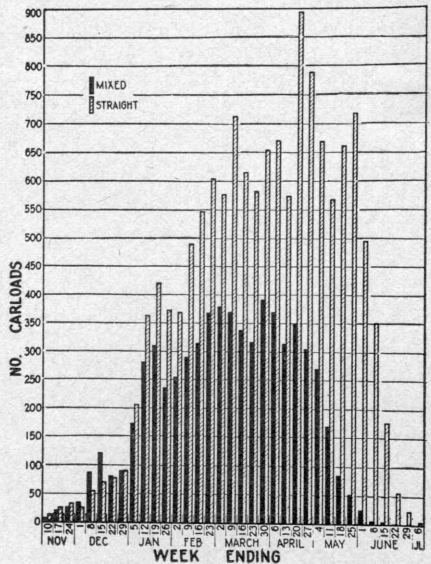


Fig. 4. Weekly shipments of mixed and straight carloads of vegetables from the Lower Rio Grande Valley. Averages of five-year period, 1926-27 to 1930-31.

Table 2. Straight carload equivalents of various vegetables shipped in mixed carloads from the Lower Rio Grande Valley.

Shipping season	Cabbage	Carrots	Beets	Potatoes	Spinach	Turnips	Beans	Onions	Tomatoes	Mustard	Corn	Squash	Broccoli	Turnip Greens	Parsley	Radishes	Peas	Egg Plant	Peppers	Cucumbers
1910-11	41.5	0.0		6.0		3.8	1.1	1.2	1.7					0.1					0.4	
1911-12	65.5		0.2	5.5		2.9	0.4					0.2								6.3
1912-13	204.0		0.4	55.7		19.8	0.1					0.1								0.9
1913-14	84.1			38.0	0.1		9.1	3.5				2.3						0.1		
1914-15	130.5			87.0		6.1	10.8	15.5				8.1								
1915-16	150.1			81.6	6.1		16.0	0.5				3.8							0.3	1.0
1916-17	120.6			37.5			1.1	9.2												3.6
1917-18	67.6			10.7		1.6	5.0	2.7				0.8								
1918-19	115.8			89.4			10.8	2.0	12.6		2.2	7.6								10.4
1919-20	232.4			102.6	0.9		11.1	10.2	35.4			3.5								3.9
1920-21	721.8	53.2	43.7	243.7			55.2	9.4	187.5		5.8	10.0						4.6	0.8	18.3
1921-22	1113.5	136.0	138.1	224.8	6.7		52.9	20.8	58.1		21.9	9.5						5.2	0.2	10.3
1922-23	314.8	470.5	210.4	202.0	4.4	10.1	85.1	2.0	21.3		2.9	6.5			0.1		0.4	2.7	0.4	0.8
1923-24	950.4	1187.3	425.3	442.3	41.5	21.4	185.5	7.4	26.4		13.0	20.1			1.4		0.5	8.1	2.6	4.9
1924-25	1519.8	1298.4	582.6	489.2	110.8	53.6	239.7	37.2	86.9	0.2	57.8	24.1			1.1		0.8	0.9	0.0	42.0
1925-26	1566.8	1430.4	462.1	495.2	116.8	170.0	241.9	149.2	155.2	2.0	89.2	67.4			2.0	0.5	0.5	1.5	6.9	51.9
1926-27	1625.6	1465.3	575.0	586.8	90.4	164.8	298.1	154.3	211.5	13.0	92.6	78.9	26.0		5.6		55.7	37.3	25.9	26.1
1927-28	2074.2	1667.2	764.9	570.4	229.5	223.4	368.5	121.3	204.7	35.8	54.2	60.5	16.2	69.1	88.5	15.1	28.8	36.7	7.0	10.8
1928-29	1702.6	2084.0	881.4	523.7	183.4	265.4	244.2	168.7	155.9	59.0	96.4	60.2	51.4	28.6	33.4	13.6	21.2	28.6	8.0	18.1
1929-30	1633.6	1628.0	732.9	536.9	187.7	444.0	297.2	122.5	48.9	214.8	64.4	63.5	43.2	116.5	61.1	57.6	17.5	30.0	19.1	22.9
1930-31	1925.9	1382.7	687.7	689.3	265.9	313.0	332.0	229.6	74.4	127.0	37.0	73.6	142.9	37.9	84.9	54.1	15.0	70.4	112.0	17.0
Total	16361.1	12803.0	5504.7	5518.3	1244.2	1699.9	2465.8	1067.2	1280.5	451.8	537.4	500.7	279.7	252.2	278.1	140.9	140.4	226.1	183.7	249.2

Table 2. Straight carload equivalents of various vegetables shipped in mixed carloads from the Lower Rio Grande Valley—Continued.

Shipping season	Endive	Escarole	Anise	Gauli-flower	Dandelion	Shallots	Chickory	Okra	Collards	Lettuce	Kohlrabi	Canta-loupes	Kale	Romaine	Celery	Swiss Chard	Garlic	Water-melon	Dill	Total
1910-11					0.1		1.1													57
1911-12																				81
1912-13																				281
1913-14							8.7										0.1			146
1914-15																				258
1915-16							6.6													266
1916-17							2.0													174
1917-18							1.6													90
1918-19							2.2													253
1919-20																		1.9		402
1920-21				7.7				0.3									0.0			1362
1921-22	0.2			23.6			22.4	0.2				11.0					0.2	5.4		1861
1922-23				1.0			8.5	0.1												1344
1923-24				16.1			5.5	0.1									0.2			3360
1924-25				0.9			2.4	0.6												4549
1925-26							5.5	2.0												5017
1926-27	0.2			8.7		1.2	4.1	3.7				0.2								5551
1927-28				19.2		1.2	0.4	2.2				6.8	0.4							6677
1928-29	6.2	2.2	11.7	11.1	9.9	15.5	2.5	0.6	3.8	0.8	1.4	0.2		0.3						6694
1929-30	20.0	27.9	6.5	8.7	14.2		3.6	0.6	7.6		5.5				0.1					6437
1930-31	37.6	9.9	33.6	3.9	10.7	0.3	1.2	0.8	37.4	0.1	0.9		0.2	0.9		0.7			8.5	6813
Total	64.2	40.0	51.8	100.9	34.9	18.2	7.3	11.2	47.8	71.9	7.8	18.2	0.6	1.2	0.1	0.7	0.5	7.3	3.5	51673

Table 3. Shipments in straight carloads of vegetables from Lower Rio Grande Valley. Data furnished by Missouri Pacific Lines, Southern Pacific Lines, and Market News Service, United States Department of Agriculture.

Shipping season	Cabbage	Carrots	Beets	Potatoes	Turnips	Beans	Spinach	Onions	Tomatoes	Corn	Parsley	Broccoli	Turnip Greens	Miscellaneous	Total
1910-11	512			83				101							696
1911-12	1220							335						26	1581
1912-13	1396							546						116	2058
1913-14	2491			22				516						48	3077
1914-15	1571			59		6		712						211	2559
1915-16	649			131		12		346						24	1162
1916-17	822			127				381						58	1388
1917-18	309			217		1		333						7	867
1918-19	1202			81		1		133	91					43	1551
1919-20	4230			151		2	2	877	85					80	5427
1920-21	1625			240		30	20	180	465	21				20	2591
1921-22	3654	154	31	374		63	19	225	116	45				127	4808
1922-23	1027	130	73	123		71	31	302	110	82				220	2169
1923-24	5859	488	315	505		9	154	11	439	288				184	8577
1924-25	3843	971	150	1003		23	415	105	353	324	688			133	8009
1925-26	3791	1081	119	1346		20	422	148	359	925	876			122	9242
1926-27	3786	819	224	1604		9	315	19	88	910	1036			27	84
1927-28	6129	1356	548	1541		25	269	15	74	1356	714			14	12279
1928-29	6253	2499	957	1662		230	316	87	394	1897	1007			38	15692
1929-30	4836	2031	1044	2977		70	538	245	759	2284	1172			217	16388
1930-31	6412	955	948	1646		139	446	183	654	2925	841			168	15558
Total	61617	10484	4409	13892		525	3076	885	8107	11766	6803			706	124644





MIXED CARLOAD VEGETABLE DISTRIBUTION FROM RIO GRANDE VALLEY 15

Week ending	Cabb	Carr	Be	Pota	Turn	Bea	Spin	Onio	Toma	Cor	Pars	Brocc	Turn	Green	Misc	Total
November			0.4			0.6			0.2							1.2
10	0.4		3.8			3.4			5.8							13.4
17	0.8		6.0		0.2	3.8			15.2							26.0
24	2.4	1.2	8.0		0.2	3.8			17.4		0.2					33.2
December			1.2	0.2	0.2	1.4			14.6			0.3				26.1
8	6.6	4.6	18.2	1.0	0.6	5.8	1.4	0.2	16.4		0.2	0.3	0.4			55.7
15	23.2	6.0	21.0	4.6	1.6	0.6	3.8	0.2	9.0		1.0	0.5	0.4			71.9
22	38.8	2.4	15.4	4.6	0.4	0.2	8.0	0.2	5.8		0.2	1.3				77.3
29	57.8	7.2	12.2	5.2			4.6	0.2	2.4		1.0	1.0				91.6
January			15.6	18.2	2.0	1.8	14.6	0.2	0.6		1.4	4.5				207.3
12	239.2	61.4	31.4	8.4	2.0	0.4	12.2	0.4	0.2		2.4	4.5	1.0			363.5
19	283.6	76.6	29.4	5.8	3.6		11.2		0.2		2.0	7.3	1.4			421.1
26	296.0	39.4	16.8	4.2	2.6		4.6	0.2			4.4	4.5	0.4			373.1
February			51.0	19.8	2.0	2.4	0.2	5.6			3.6	1.8				369.4
9	399.8	37.8	31.2	2.4	4.4		5.8				5.2	2.3	1.2			490.1
16	426.8	66.6	33.8	1.2	5.4		7.2				3.4	0.8	3.2			548.4
23	461.2	97.4	30.8	1.4	2.8		4.4				6.2	0.5	0.8			605.5
March			86.2	39.6	2.0	5.6	0.6				4.2	1.5	1.0			577.1
9	540.8	100.6	59.2	1.2	5.2		2.0				4.6	0.8	0.4			714.8
16	413.4	120.0	57.2	5.8	5.2	2.2	2.2				6.2	0.8	0.8			616.0
23	369.4	83.2	47.4	33.0	4.0	9.8	20.0*	10.0			6.4	0.3	0.2			583.7
30	356.0	84.4	45.4	80.8	3.2	44.4	1.6	29.2			9.0					654.0
April			111.4	37.2	181.2	1.0	70.4	58.0	0.4	10.4	0.3	0.3	0.2			672.7
6	202.2															
13	152.4	70.2	43.0	166.0		62.6		67.8		6.2	6.6					574.8
20	194.2	91.4	45.8	378.4	0.4	55.0		93.8		26.2	8.0	0.3				893.5
27	88.6	98.8	33.4	378.6		45.2										790.2
May			92.8	16.2	337.6	38.0		85.6	6.8	43.2	10.0					970.0
4	46.4							27.8	39.0	60.8	11.4					670.0
11	9.0	66.8	8.0	182.4		27.6		12.0	158.2	99.0	10.6					568.6
18	3.4	25.4	7.0	54.8		3.8		4.2	423.4	136.4	4.0					662.4
25	15.4	1.0	24.6			0.4		1.2	500.2	174.2	2.8					719.8
June			7.2	1.2	9.2			0.4	338.0	133.8	2.6					497.4
1	5.0															
8	0.2	4.8		2.4	0.4			208.4	135.0	0.8						352.0
15		3.4		0.8				94.0	78.2	0.8						177.2
22		1.6						20.4	32.6	1.0						55.6
29								3.0	21.4							24.4
July								0.2	6.2							6.4
6									0.4							0.4
Miscellaneous																136.4
Total	5483.2	1532.0	744.2	1886.0	53.2	379.6	109.8	393.8	1874.4	954.0	130.5	33.6	11.4	136.4		13722.2

which shipments have been made from the Lower Rio Grande Valley has decidedly increased in more recent years; the peak movement of a few weeks characteristic of the first three periods, has yielded to a heavy movement over a long season during the last period. In earlier years, growers produced primarily for the spring market; growers of today produce also for fall and winter markets.

As a further means of emphasizing the role of mixed carloads shipments, a comparison of average weekly shipments of mixed and straight carloads for the period 1926-27 to 1930-31, is presented in Figure 4. The shipping season opens with mixed carloads predominant. While mixed carloads constituted 31.9 per cent of total shipments for that period, they made up more than fifty per cent of total shipments for the months of October, November, and December. Unquestionably, the volume of vegetables shipped from the Lower Rio Grande Valley has been augmented by mixed carload shipments. This is particularly true of shipments during fall and early winter.

#### Mixed Carloads Have Facilitated Diversified Plantings

Table 6 shows the relation between numbers of vegetables shipped, by periods, in mixed and straight carloads. It is evident, as new vegetables are introduced, that shipments occur first in mixed carloads followed later by shipments in straight carloads.

Diversification of vegetable plantings in the Lower Rio Grande Valley has been encouraged and facilitated by mixed carload shipments. The introduction of new vegetables usually involves risks both as to their adaptability to soil and climatic conditions and as to market outlets.

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

Express shipments offer an opportunity of placing the new commodities on the market but the territory opened is usually limited to relatively nearby consuming centers. This is also true of shipments by motor truck. If distant markets could be reached only through straight carload shipments, shippers would obviously need to assume the risk of moving a few carloads to a small number of markets. If, on the other hand, small quantities of the commodity could be loaded into a considerable number of



mixed carloads with established market outlets, a wide distribution could be effected with a minimum of risk.

Thus the mixed carload is an important instrument in the process of experimenting with the growing and marketing of new vegetables. This role of the mixed carload has by no means come to an end. During the period 1926-27 to 1930-31, more than a dozen new vegetables were introduced in the Lower Rio Grande Valley. Their volume of production was small and movement primarily by express and motor truck to nearby markets and in mixed carloads to distant markets. If any, or all, of these vegetables prove adaptable to conditions obtaining in that area, and if market outlets can be expanded through mixed carload shipments, volume of production will undoubtedly be increased and movement in mixed and straight carloads augmented.

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. To the extent, then, that mixed carloads have fostered diversified plantings of vegetables, they have been a factor in stimulating an increased volume of marketable produce.

### Weekly Shipments of Various Vegetables in Mixed Carloads

The seasonal aspect of mixed carload shipments is indicated in Table 4, which gives average weekly shipments for the period 1926-27 to 1930-31, of the various vegetables moved in mixed carloads. Table 5 shows average weekly shipments of the more important vegetables in straight carloads. During November and December, 43.7 per cent of the total volume of cabbage and 80.3 per cent of carrots were shipped in mixed carloads, whereas for the whole season, 24.6 per cent of cabbage and 51.8 per cent of carrots moved in mixed carloads. In the case of potatoes, for the first seventeen weeks of the shipping season, 69.9 per cent of the total volume moved in mixed carloads, whereas for the whole season, 23.6 per cent of the total volume moved in mixed carloads.

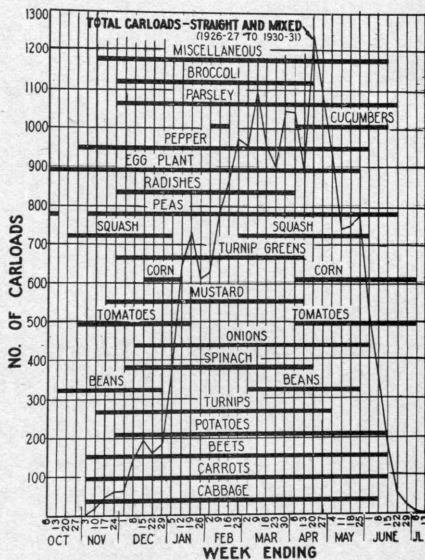


Fig. 5. Marketing season of vegetables shipped from the Lower Rio Grande Valley.

At the present time, vegetables start moving to market, in a small

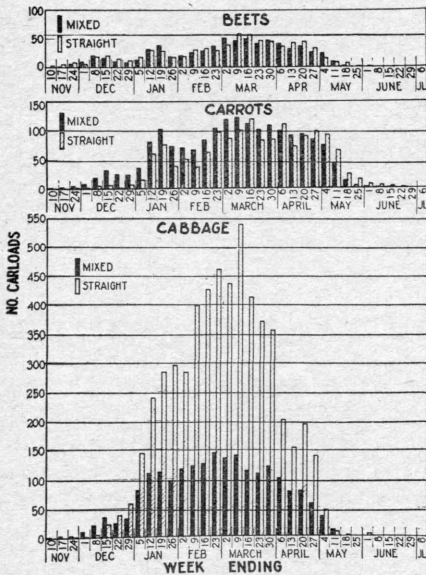


Figure 6. Weekly shipments of beets, carrots, and cabbage in mixed and straight carloads. Averages of five-year period, 1926-27 to 1930-31. Note long marketing season and heavy volume.

way, early in October and continue into July, a span of more than forty weeks. During the last five-year period, fifty per cent of the total volume, both mixed and straight, moved during the ten-week period, March 3 to May 11. As an aid in visualizing the seasonal movements of the various vegetables shipped from the Lower Rio Grande Valley, Figure 5 is presented, showing, without reference to volume, the period of weeks that each of the more important vegetables are shipped to market.

Weekly shipments in mixed and straight carloads of the eight most important vegetables representing 86.4 per cent of total mixed and 96.5 per cent of total straight carloads are shown in Figures 6 to 8, inclusive. According to the nature of weekly shipments, these vegetables may be divided into three groups.

- Group 1. These vegetables have a long shipping season as well as a long period of heavy shipments. Cabbage, carrots, and beets, which make up this group, accounted for 65 per cent of total shipments in mixed carloads and 57 per cent in straight.
- Group 2. These vegetables also have a long shipping season, but they have a long period of light shipments in fall and winter, and a short period of heavy shipments in spring. Potatoes and onions make up this group.
- Group 3. These vegetables have a fall movement and then drop out during the winter to reappear in spring and early summer. Beans, tomatoes, and green corn belong to this group.

In their relationship to mixed carload shipments, tomatoes and green corn possess several features distinctly different from those of the other vegetables under consideration. In the first place, their period of heavy shipment comes late in the season after the movement of other vegetables has largely ceased. This loss in variety of vegetables available lessens the opportunities of their appearing in mixed carloads. In the second place, tomatoes and green corn are not adapted to shipment in the same carload, as the former usually moves under ventilation and the latter under refrigeration. Hence a two-commodity mixed carload of tomatoes and green corn has never developed to rival the two-commodity mixed carload of beets and carrots.

In comparison with the various areas of commercial vegetable production in the United States, the Lower Rio Grande Valley enjoys a long favorable growing season. Fortunately, for growers of this section, a large part of this growing season corresponds with an active demand in the markets of the country for the produce grown. The introduction of beets and carrots, commercially, about 1921-22, has been of momentous importance in the vegetable enterprise of this area. These vegetables have a long growing season and enjoy a relatively large market demand. Not only did they offer the possibility of developing the popular beet and carrot mixed carload, but they greatly increased the opportunities for shipping such vegetables as cabbage, potatoes, beans and the like, in mixed carloads with either beets or carrots, or with both. Beets and carrots largely accounted for the change in weekly shipments of mixed carloads during the periods, 1920-21 to 1925-26 and 1925-26 to 1930-31 (Figure 3) as contrasted with those of the two earlier periods.

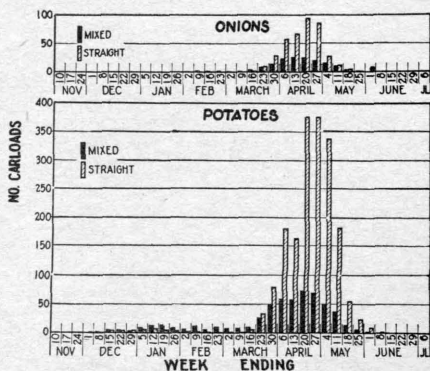


Fig. 7. Weekly shipments of onions and potatoes in mixed and straight carloads. Averages of five-year period, 1926-27 to 1930-31. Note period of light shipments followed by period of heavy shipments.

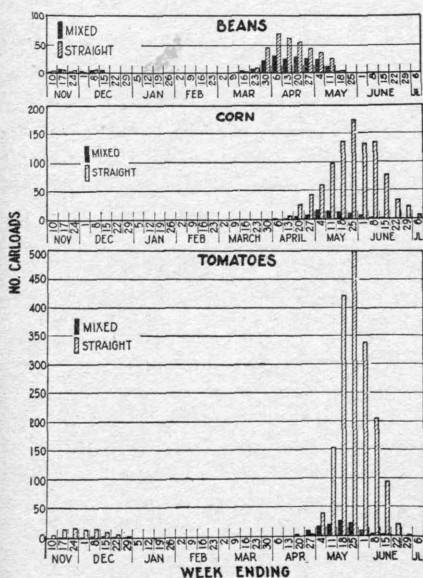


Fig. 8. Weekly shipments of beans, corn, and tomatoes in mixed and straight carloads. Averages of five-year period, 1926-27 to 1930-31. Note light fall and heavy spring shipments.

The weekly movements of the various vegetables in mixed and straight carloads reflect both the length of the growing period and the season of marketing opportunities. Vegetables assuming leading rank from the standpoint of volume in mixed carloads seem to be characterized by: 1. Long marketing season. 2. Heavy and stable demand. 3. Adaptability to mixing with other vegetables in same carload. 4. Marketing season concurrent with that of numerous other vegetables.

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A measure of significance of the mixed carload in the distribution of vegetables from the Lower Rio Grande Valley is to be found in the relation of the volume of specific commodities shipped in mixed and straight carloads. As to the relative volume shipped in mixed and straight carloads, vegetables may be classified into three groups:

- Group 1. Straight carload shipments were relatively most important in this group, as mixed carloads accounted for but 21.8 per cent of the total. The vegetables in this group were cabbage, potatoes, green beans, onions, tomatoes, green corn, and parsley.
- Group 2. The volumes shipped in straight and mixed carloads were nearly equal in this group, mixed shipments accounting for 51.1 per cent of the total. Carrots and beets composed this group.
- Group 3. Shipments in mixed carloads predominated in this group, which included all other vegetables except those in the two groups as indicated above. Mixed carload movements constituted 73.5 per cent of total shipments. While the volume of vegetables in this group was relatively small, still potentialities are not to be overlooked. Without the mixed carloads these vegetables would undoubtedly have been of much less importance than they are at present.

As for the importance of a given vegetable in the mixed carload shipments, at least three tests may be applied: first, the percentage of the total mixed carload movement that it accounted for; second, the percentage of all mixed carloads containing that vegetable; and finally, the percentage of the volume that it constituted of all mixed carloads containing that vegetable. These measures as applied to the twenty most important vegetables in mixed carload shipments are shown in Table 7. As to greatest relative importance in mixed carload shipments, cabbage led with 27.9 per cent of the total volume. Carrots were a close second with 25.6 per cent. As to greatest frequency of occurrence in mixed carloads, carrots led with 78.2 per cent; beets with 66.5; and cabbage with 60.8 per cent were next in line. That cabbage was dominant in mixed carloads containing that commodity was evident from the fact that it averaged 45.9 per cent of the total volume of such shipments. Carrots with 32.7 per cent and potatoes with 23.9 per cent were next in order.

#### **Mixed Carload Shipments Stimulated by Liberalization of Rules as to Freight Rates and Minimum Weights**

In general, carload lot freight rates on a hundred pounds from points in the Lower Rio Grande Valley to the various markets are the same for vegetables in the 17,500- and 20,000-pound groups. (Minimum weights for carloads of the various vegetables are shown in Table 1.) Rates on vegetables in the 24,000-pound group are about 25 per cent less than those in the other two. In the 24,000-pound group, however, there are three exceptions. Onions (dry) and potatoes take a rate about eight per cent lower than for the regular group; green corn takes the same rate as applicable to vegetables in the 17,500- and 20,000-pound groups.

Loading a carload with mixed vegetables having the same freight rates and minimum weights causes no complications from the standpoint of rates and minimum weights. But when vegetables having different rates and minimum weights are mixed, a situation arises that straight carload

schedules do not cover. Then the problem must be faced as to minimum weights to be fixed and rates to be charged.

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 these mixed carloads were shipped

Table 7. Relative importance of various vegetables in mixed carload shipments based on averages of five-year period, 1926-27 to 1930-31.

Commodities	Percentage given commodity is of mixed carload shipments	Percentage of mixed carloads containing given commodity	Percentage given commodity is of mixed carloads containing given commodity
Cabbage	27.9	60.8	45.9
Carrots	25.6	78.2	32.7
Beets	11.3	66.5	17.0
Potatoes	9.0	37.6	23.9
Beans	4.8	23.1	20.8
Turnips	4.4	32.2	13.7
Spinach	3.0	25.5	11.8
Onions	2.5	21.3	11.7
Tomatoes	2.2	8.9	24.7
Mustard	1.4	15.3	9.2
Corn	1.1	6.6	16.7
Squash	1.0	14.3	7.0
Broccoli	0.9	4.9	18.4
Parsley	0.9	13.6	6.6
Turnip Greens	0.8	5.7	14.0
Egg Plant	0.6	4.6	13.0
Peppers	0.5	4.9	10.2
Radishes	0.4	5.7	7.0
Peas	0.4	6.8	5.9
Cucumbers	0.3	4.6	6.5
Miscellaneous	1.0		

to markets within Texas. During the period 1910-11 to 1915-16, cabbage and potatoes made up the bulk of shipments in mixed carloads. More than 70 per cent of the mixed carloads contained but two commodities with carloads of three commodities accounting for an additional 20 per cent.

As mixed carloads with four or more vegetables became more common, and as markets outside of Texas became of greater importance, early simplicity vanished.

According to rules adopted in 1916, the rate on vegetables in a mixed carload was fixed as that of the vegetable, or group, having the higher, or highest, rate and the minimum weight as that of the vegetable, or group, having the higher, or highest, minimum. These rules clearly placed mixed carload shipments, as a group, under a severe handicap as contrasted with straight carload shipments. In mixed carloads composed of vegetables from the 24,000-pound class and from one, or both, of the other two, the relative quantity of the former runs high. This meant, under the old rule, that vegetables of minor importance in the load from the standpoint of quantity advanced the rate on vegetables composing the major portion of the load. The highest-rate rule placed an advantage on mixed carloads loaded heavily with the higher-rated vegetables and lightly with the lower-rated. That is, in a carload of spinach and cabbage, the greater the quantity of spinach, the less the penalty against the cabbage completing the load. Heavy loadings of spinach, or other vegetables of that type, however, were precluded by at least two factors. In the first place, the relative bulkiness of spinach restricts loadings to a maximum of about 38 per cent in order to leave sufficient space for cabbage so as to make possible a minimum weight of 24,000 pounds. In the second place, the relative volume of the various vegetables which might be loaded, was not under such control on the part of the shipper as would insure loadings of minimum penalty, but instead was determined by the relative demand in the markets to which shipped.

For many years growers and shippers of the Lower Rio Grande Valley sought to obtain more favorable freight rates and minimum weight requirements on mixed carloads. A new ruling as to rates and minimum weights was made effective for the Southwest Territory in 1928, and for the rest of the United States, with minor exceptions, in February, 1930. As to rates under the new rule, each vegetable takes its own straight carload lot rate in the mixed carload. As to minimum weights, no uniformity obtains at the present time. In the main, three rules are in force. The first rule makes the minimum to be 20,000 pounds, regardless of the minimum of the vegetables in the mixture; this rule applies to shipments to all markets in Texas and to the territory adjacent to Denver, Colorado. The second rule declares the minimum to be that of the vegetable, or group, in the mixture having the higher, or highest, minimum, provided this vegetable, or group, makes up 25 per cent or more of the total weight of the carload; this rule applies to the Southwest Territory other than Texas and to the Southeastern Territory. The third rule declares the minimum to be that of the vegetable, or group, in the mixed carload having the higher, or highest, minimum; this rule applies to Eastern, Official, and Western Territories.

### Shipment of Specialty Vegetables Increased by Changes in Rules as to Freight Rates on Mixed Carloads

The data on mixed carload shipments for the five-year period, 1926-27 to 1930-31, include the last year, 1926-27, that the old rule was in full force, and the first year, 1930-31, that the new rule was in full force. A comparison of mixed carloads composed of different-rated commodities for 1926-27 and 1930-31, shows that the following changes have occurred:

1. Such shipments rose from 59.2 per cent of all mixed carloads in 1926-27, to 79.5 per cent in 1930-31, an increase of 25 per cent. This is an indication that shippers were responding to the greater flexibility of the new rule.

2. Of the total of such shipments, the percentage destined to nearby markets in the West South-Central States (Texas, Oklahoma, Louisiana, and Arkansas) declined from 58.6 in 1926-27, to 26.4 in 1930-31. Under the old rule the penalty against the lower-rated vegetables was less felt on shipments to nearby markets; hence the relative importance of nearby markets for such carloads. The decided increase in relative importance of distant markets as outlets for mixed carloads of different-rated vegetables under the new rule is an indication of far-reaching changes in the make-up of mixed carloads loaded for such markets.

3. Vegetables in the 17,500-pound minimum weight group rose from 6.2 per cent of the total weight of carloads containing such commodities in 1926-27 to 15.0 per cent in 1930-31; vegetables in the 20,000-pound minimum weight group declined from 22.4 per cent of the total weight of carloads containing such commodities in 1926-27 to 18.7 per cent in 1930-31. This increase of 240 per cent in shipments of vegetables of the 17,500-pound group can be accounted for through the opening up of the distant markets to different-rated combinations brought about by the new rule of each commodity taking its own carload lot rate. While the new rule was in the process of being realized, growers had been encouraged to expand their production of specialty vegetables on the strength of expanded market outlets for such vegetables under the new schedule. The decline of 17 per cent in shipments of vegetables of the 20,000-pound group can largely be explained in terms of the relative decline in shipments of mixed carloads to Southern markets, as vegetables of this group have their chief outlet in those markets.

4. The total number of the two-commodity mixed carloads of beets and carrots dropped from 1,534, or 28 per cent of total mixed carloads shipped in 1926-27, to 552, or 8 per cent of total mixed carloads shipped in 1930-31. Of total shipments of beets and carrots in all mixed carloads, the two-commodity beets and carrots accounted for 75 and 76 per cent, respectively, in 1926-27, and 35 and 23 per cent, respectively, in 1930-31. One of the reasons for the importance of the two-commodity beets and carrots during the former season was due to the fact that both commodities had the same rate and minimum weight. This type of carload

was popular for shipment to distant markets, especially to the New England and Middle Atlantic States. The decided increase in shipments of beets and carrots in the general mixed carload during 1930-31, reflected the favorable consequences of the changes in freight rates applicable to mixed carloads.

### Need for Standardization of Minimum Weight Requirements

Variations in rules as to minimum weights are somewhat confusing and may prove costly to the shipper in the event of a necessity to divert or reconsign a mixed carload. Take, for instance, a mixed carload of spinach and cabbage loaded to a minimum of 20,000 pounds for a market in Texas. If the carload contains 5,000 pounds, or more, of cabbage, a diversion to any other market in the Southwest Territory, or to any point in the Southeastern Territory, would make a 24,000-pound minimum operative. Consequently, freight charges on a deficiency of 4,000 pounds would have to be paid. Diversion to any market in Official, Eastern, or Western Territories, regardless of the amount of cabbage in the mixture, would make the 24,000-pound minimum effective. If a shipper of a mixed carload wishes to keep open all markets in case of a need to divert, he must load a minimum weight according to that of the vegetable, or group, in the carload having the higher, or highest, minimum. This means that the old rule as to minimum weights, with important qualifications, is still in force.

It is to the advantage of shippers and receivers to load at least up to the minimum weight. Any deficiency in weight which must be paid for means an increase in freight rates. Most of the vegetables in the 20,000-pound group, may be loaded to a minimum of 24,000 pounds. The mixing of such vegetables, no matter what the proportion, with vegetables of 24,000-pound minimum, offers no barrier in reaching a minimum of 24,000 pounds. It is chiefly in combinations between vegetables of the 24,000- and 17,500-pound classes that difficulties arise, and in this case, principally with the two vegetables, spinach and parsley. The demand for these vegetables in the smaller cities is so light that the quantities desired in the mixed carload are too small to interfere with reaching the minimum weight. Hence, it is mainly in the case of the larger cities not desiring straight carloads of these vegetables but a mixed carload loaded heavily to them that difficulties are encountered. Suppose a receiver desires 250 bushels of spinach and 250 bushels of parsley, the rest of the car to be loaded with cabbage. About 864 bushels make a maximum carload. Hence the 500 bushels take up nearly three-fifths of the space; this quantity of spinach and parsley makes a total weight of 10,250 pounds, or less than half a carload. The remaining space loaded with cabbage in Los Angeles crates would make a total weight of 13,322 pounds, leaving a deficiency of 428 pounds. Quite frequently receivers in the larger cities insist on loadings of this nature, being willing to pay for the deficiency.



A standardization of minimum weight requirements would materially facilitate the shipment of mixed carloads. The 20,000-pound minimum is, perhaps, unnecessarily favorable to shipper and receiver. The 25 per cent rule would permit heavy loadings of the bulkier vegetables without any sacrifice as to minimum weights. Take, for instance, loadings of spinach and parsley with cabbage. By loading more than 13,125 pounds of these vegetables and less than 4,375 pounds of cabbage, 17,500 pounds would become the minimum weight. The 25 per cent rule would, undoubtedly, be quite satisfactory and would clear up most of the difficulties concerning shipments to the larger cities which arise under the highest minimum rule.

### Mixed Carload Shipments Modified by Motor Truck Shipments

Carload shipments are affected by motor truck shipments principally in two spheres: nearby markets within trucking distance of the producing area; small markets within trucking distance of large cities. Unfortunately, no data are available as to the volume of vegetables trucked from the Lower Rio Grande Valley during the period 1926-27 to 1930-31. Attention, however, may be called to the fact that motor truck registrations in Texas increased from 62,754 in 1925, to 210,850 in 1932. It is not to be inferred that truck movements increased by like proportion. But it seems reasonable to assume that a part of this increase was devoted to the transportation of vegetables. Data on unloads of Texas-grown vegetables in the larger Texas cities are suggestive. In 1930-31, as compared with 1926-27, straight carload shipments of Texas cabbage, potatoes, tomatoes, green corn, spinach, and green beans increased by 52 per cent; unloads increased by five per cent. Shipments of Texas mixed vegetables increased by 31 per cent; unloads in Dallas and Fort Worth decreased by 50 per cent; decreases in shipments of mixed carloads to the smaller cities in Texas were much more pronounced than those to the larger cities. It would seem, then, that motor truck shipments have reduced the volume of mixed carloads to nearby markets to a greater degree relatively than that of straight carloads.

*The more distant small markets receiving their vegetables in mixed carloads direct from the Lower Rio Grande Valley are located principally in states like Kansas, Iowa, and North Carolina at considerable distance from large markets. Small markets near large cities are served indirectly through the large markets. Formerly, such cities received their vegetables, in part, in mixed carloads loaded at the large markets. This was particularly true of the more distant points if rates were favorable and minimum weights low. Many of these markets were potential outlets for direct shipments of mixed carloads if more favorable rates were obtainable. This explains the opposition on the part of many dealers in the large markets to the adoption of a better rate schedule. By the time the rate situation was changed to the satisfaction of growers and shippers in the Lower Rio Grande Valley, however, good roads and the motor truck*

Table 8. Destinations of vegetables, expressed as straight carload equivalents, shipped in mixed carloads according to size of cities. Averages for five-year period, 1926-27 to 1930-31. Data on mixed carloads determined from data on unloads in sixty-six cities and daily market reports of the Market News Service, United States Department of Agriculture.

Size of cities	Cabbage	Carrots	Beets	Potatoes	Beans	Turnips	Spinach	Onions	Tomatoes	Mustard	Corn	Squash	Broccoli	Parsley	Turnip Greens	Egg Plant	Peppers	Radishes	Peas
10,000	144.1	28.0	4.3	41.4	12.8	10.1	5.2	17.7	3.3	2.9	1.1	2.3	0.1	.4	1.7	0.2	0.4	1.0	1.8
10,001-20,000	214.6	55.9	10.7	56.1	16.4	18.9	13.7	21.9	16.7	5.5	3.4	3.9	0.1	.4	1.5	0.4	0.8	0.7	3.1
20,001-30,000	134.0	38.9	9.0	45.1	14.2	22.0	12.1	26.0	24.7	8.3	5.6	4.4	0.3	.4	3.7	0.4	0.8	1.0	4.0
30,001-40,000	96.6	47.3	10.8	17.0	3.9	5.2	7.9	9.9	2.7	1.9	1.2	.6	0.3	.2	0.9	0.0	0.2	0.3	0.7
40,001-50,000	95.8	39.8	10.4	38.1	16.6	12.7	8.4	11.6	11.9	4.4	2.5	3.9	0.1	.6	1.5	0.7	1.4	0.5	1.2
50,001-75,000	117.4	91.6	23.3	41.7	13.3	11.4	24.4	13.1	11.7	3.1	3.6	2.9	0.5	.5	2.1	0.2	0.4	1.0	4.5
75,001-100,000	106.5	70.5	22.9	21.7	18.2	20.6	14.9	8.1	9.9	9.9	8.3	8.8	1.2	.6	4.8	1.8	1.7	0.3	3.1
100,001-150,000	139.1	141.3	42.3	51.6	26.1	18.8	18.1	16.0	12.4	6.1	5.3	5.7	2.3	1.5	5.3	1.0	0.8	2.8	1.4
150,001-200,000	108.2	86.5	30.8	57.1	43.4	16.8	13.9	9.8	8.7	8.4	10.5	14.1	0.7	.7	8.4	1.0	1.4	1.0	1.6
200,001-300,000	164.6	164.9	55.6	71.8	44.9	30.3	31.2	12.7	6.0	8.9	10.2	9.2	3.7	2.7	8.1	2.0	1.2	1.9	2.2
300,001-400,000	65.2	123.0	60.4	41.6	29.0	27.5	6.9	3.9	1.0	8.7	1.2	1.1	1.5	1.8	3.3	0.0	0.2	3.6	0.1
400,001-500,000	29.0	79.3	42.4	19.8	8.6	5.4	5.5	0.8	7.0	1.2	3.8	6.4	0.4	1.2	0.1	9.3	1.5	0.4	0.1
500,001-750,000	41.0	116.8	55.0	10.4	3.6	1.3	5.0	2.2	2.2	0.2	0.1	0.2	1.6	1.0	0.9	2.3	0.8	0.4	0.0
750,001-1,000,000	54.6	127.8	73.0	32.6	18.9	11.4	9.2	1.9	2.9	2.2	4.0	2.6	3.9	1.9	2.0	3.0	1.6	2.4	0.2
1,000,001-	281.7	433.9	277.5	35.4	38.1	69.7	15.0	3.7	18.0	18.2	8.1	6.2	39.2	40.8	6.1	18.3	21.2	10.8	3.5
Total	1792.4	1645.5	728.4	581.4	308.0	282.1	191.4	159.3	139.1	89.9	68.9	67.3	55.9	54.7	50.4	40.6	34.4	28.1	27.6

Table 8. Destinations of vegetables, expressed as straight carload equivalents, shipped in mixed carloads according to size of cities. Averages for five-year period, 1926-27 to 1930-31. Data on mixed carloads determined from data on unloads in sixty-six cities and daily market reports of the Market News Service, United States Department of Agriculture—Continued.

Size of cities	Cucumbers	Endive	Anise	Cauli-flower	Collards	Escarole	Dandelion	Shallots	Kohlrabi	Okra	Chickory	Canta-loupes	Lettuce	Dill	Romaine	Kale	Swiss Chard	Celery	Total
- 10,000	0.5	0.2	0.1	0.7	0.1	0.1	0.1	0.2		0.0	0.1		0.2						281.2
10,001- 20,000	2.4	0.3		1.2		0.0		0.4		0.1	0.0	0.1	0.1						449.3
20,001- 30,000	1.9	0.2	0.0	0.7	0.1	0.1		0.3		0.3			0.0						358.5
30,001- 40,000	1.1	0.2	0.0	0.6		0.0		0.0		0.1			0.0					0.0	209.6
40,001- 50,000	1.5	0.1		1.0	0.2	0.0		0.2		0.1	0.0		0.1			0.0			265.3
50,001- 75,000	1.3	0.6	0.1	1.0		0.0	0.0	0.2	0.1	0.1		0.0	0.0					0.0	370.2
75,001- 100,000	0.9	0.9	0.4	1.3		0.1	0.2	0.2		0.3		0.0	0.1						333.2
100,001- 150,000	2.3	1.0	0.8	0.9	0.1	1.9	0.6	0.7	0.1	0.3	0.5		0.2						507.3
150,001- 200,000	2.5	0.3	0.0	1.5	0.2	0.0		0.4	0.0	0.1		0.0				0.1			428.1
200,001- 300,000	2.0	1.4	0.1	1.0	0.1	0.9	0.1	0.1		0.1			0.1						638.0
300,001- 400,000	0.3	0.1	0.0	0.2					0.0				0.1						380.7
400,001- 500,000	0.2	0.0	0.0							0.1									222.5
500,001- 750,000	0.7	0.3	0.2		0.0	0.2	0.0	0.2	0.0										246.6
750,001-1,000,000	0.4	2.0	0.7	0.2		0.5	0.8	0.5	0.1						0.2	0.0			361.5
1,000,001-	0.9	5.2	8.0		8.8	4.2	5.2	0.2	1.3		0.9	1.3	0.2	0.7	0.0		0.1		1382.4
Total	19.0	12.8	10.4	10.3	9.6	8.0	7.0	3.6	1.6	1.6	1.5	1.4	1.1	0.7	0.2	0.1	0.1	0.0	6434.4

had tied these markets more closely than ever before to the nearby large markets. Produce dealers in these small markets find certain advantages in seeking their supplies in the nearby large market in such matters as: (1) variety of vegetables (Whatever varieties of vegetables are obtainable at the various shipping points are usually in stock at the large markets); (2) reduction of risks (Supplies may be purchased to be turned in a very few days; F. O. B. purchases direct from the Lower Rio Grande Valley would involve considerable time with the chance of a drop in price in the meantime); (3) financing (The large market dealer by giving 10 or 15 days credit greatly eases the problem of financing on the part of the small market dealer).

Markets in Missouri, for instance, receive a large part of their Texas vegetables from St. Louis and Kansas City; in Illinois from Chicago and St. Louis; and in the New England states from Boston. Markets within a radius of 50 to 100 miles of New York City procure their vegetables almost exclusively in that city. Under exceptional circumstances even Boston and Philadelphia may draw upon New York City. Without motor truck competition, mixed carload shipments from the Lower Rio Grande Valley under the favorable rate schedules adopted a few years ago would have been quite different from what they are today. Small markets would have been of much greater relative importance than is now the case.

#### Mixed Carload Destinations According to Size of City

Destinations of mixed carloads, according to size of cities, together with straight carload equivalents of the various vegetables are shown in Table 8. Destinations of straight carloads of the more important vegetables are shown in Table 9. In both tables, the carload figures represent averages for the five-year period, 1926-27 to 1930-31.

As for destinations of mixed and straight carloads to the larger cities, the unload data for 66 cities compiled by the Market News Service, United States Department of Agriculture, was used. The remaining carloads were apportioned among the small-sized city groups according to data on destinations to the smaller cities as indicated in the daily reports of the Market News Service. Straight carload equivalents of mixed carloads according to size of cities were determined on the basis of the sample data.

An examination of Table 8 shows that not only do mixed carloads move to all sizes of cities but in particularly large volume to the larger cities. An explanation of this situation involves a number of factors. The number of cities in each size-group receiving mixed carloads was determined together with their total population. The number of cities receiving straight carloads of the more important vegetables was also found. These data are presented in Table 10. While the number of cities in the smaller size-groups runs high, total population runs low. Whereas cities of 10,000, or less, make up 1.1 per cent of the total population of cities receiving mixed carloads, cities of 1,000,000, or more, account for

36.6 per cent of the total. As between numbers of cities receiving mixed carloads and straight carloads of cabbage, differences for the various groups are of minor importance. As for the other vegetables, the number of cities in the smaller size-groups receiving straight carloads runs low.

Another consideration is that of the volume of movement in mixed and straight carloads to the different size-groups. Table 11 shows the percentages of the total movement, mixed and straight, that were shipped in

Table 9. Destinations of straight carloads according to size of cities. Averages for five-year period, 1926-27 to 1930-31. Data on destinations determined from data on unloads in sixty-six cities, and daily market reports of the Market News Service, United States Department of Agriculture.

Size of cities	Cabbage	Potatoes	Tomatoes	Carrots	Corn	Beets	Onions	Beans	Spinach	Total
..... - 10,000	149.2	27.8	15.0	2.8	0.4	2.4	2.2	0.8		200.6
10,001- 20,000	256.4	68.0	49.6	4.2	0.4	0.6	4.8	1.0	0.4	385.4
20,001- 30,000	187.2	54.2	44.8	4.4	2.8	2.2	5.6	1.6	1.2	304.0
30,001- 40,000	152.8	30.6	39.4	5.0	1.8	1.2	4.8	1.8	0.2	287.6
40,001- 50,000	97.6	49.2	42.0	3.4	7.6	0.6	4.0	4.2	0.2	208.8
50,001- 75,000	206.4	117.0	60.0	11.2	6.0	3.0	16.0	2.6	1.2	423.4
75,001- 100,000	166.6	70.8	78.0	13.2	14.0	8.0	13.4	4.8	2.2	371.0
100,001- 150,000	382.0	178.2	154.6	47.4	19.6	7.8	22.0	11.2	2.2	825.0
150,001- 200,000	287.4	95.6	88.8	28.2	45.2	12.2	10.6	17.0	2.2	587.2
200-001- 300,000	760.8	317.4	178.6	67.6	120.8	11.8	34.8	63.2	7.2	1562.2
300,001- 400,000	340.0	177.4	115.6	54.0	79.6	24.6	18.0	67.6	4.0	880.8
400,001- 500,000	253.4	101.2	89.6	107.6	74.4	47.8	21.8	26.8	11.4	734.0
500,001- 750,000	399.6	64.2	164.4	132.2	16.6	43.4	26.4	26.0	5.6	878.4
750,001-1,000,000	581.0	174.0	184.8	293.2	94.4	122.4	52.0	65.4	19.2	1586.4
1,000,001- .....	1262.8	360.4	569.2	757.6	470.4	456.2	157.4	85.8	52.6	4172.4
Total	5483.2	1886.0	1874.4	1532.0	954.0	744.2	393.8	379.8	109.8	13357.2

mixed carloads, according to size of cities. As the size of cities increases, the relative importance of the mixed carload rather consistently decreases. As for movement to cities of 40,000, or less, the mixed carload was of minor importance for tomatoes and represented somewhat less than fifty per cent of the total movement of cabbage and potatoes. In the case of other vegetables, however, the relative importance of the mixed carload ran high.

Table 10. Total population of cities receiving mixed carloads and numbers of cities receiving mixed and straight carloads according to size of cities for five-year period, 1926-27 to 1930-31. Data on destinations determined from data on unloads in sixty-six cities, and daily market reports of the Market News Service, United States Department of Agriculture.

Size of cities	Total population of cities receiving mixed carloads	Number of cities receiving carloads of vegetables									
		Mixed	Straight								
			Cabbage	Po-tatoes	To-matoes	Carrots	Onions	Beets	Corn	Beans	Spinach
- 10,000	432,367	79	61	12	3	4	2	2	1	1	
10,001- 20,000	1,123,064	79	73	19	5	5	4	1	1	1	1
20,001- 30,000	1,037,719	43	44	14	13	5	5	2	1	2	1
30,001- 40,000	866,625	25	23	7	9	5	3	1	1	1	1
40,001- 50,000	715,104	16	17	6	9	4	3	1	2	2	1
50,001- 75,000	1,760,996	29	28	14	5	8	4	3	2	2	1
75,001- 100,000	1,320,064	16	15	7	13	6	7	4	3	3	1
100,001- 150,000	3,106,324	26	27	12	18	10	11	6	4	5	2
150,001- 200,000	1,532,484	9	10	4	9	7	6	5	8	3	1
200,001- 300,000	3,790,335	15	16	12	15	9	13	6	8	8	3
300,001- 400,000	2,043,342	6	7	5	7	4	5	3	4	5	2
400,001- 500,000	2,303,484	5	5	4	5	3	4	4	4	2	3
500,001- 750,000	2,391,041	4	4	4	4	3	4	4	2	2	2
750,001-1,000,000	3,308,451	4	4	2	4	4	4	3	4	3	3
1,000,001-	14,858,892	5	5	4	5	5	4	4	4	5	4
Total	40,590,292	361	339	126	124	82	79	49	49	45	26

## Mixed Carload Receipts Highest on Per Capita Basis in Small Cities

Distribution of the more important vegetables according to size of cities in mixed and straight carloads on the basis of number of carloads received

Table 11. Percentage of total movements, mixed and straight, shipped in mixed carload according to size of cities. Averages for five-year period, 1926-27 to 1930-31.

Size of cities	Cabbage	Carrots	Beets	Potatoes	Beans	Spinach	Onions	Tomatoes	Corn	Total
..... - 10,000	49.1	90.9	64.2	59.8	94.1	100.0	88.9	18.0	73.3	56.2
10,001- 20,000	45.6	93.0	94.7	45.2	94.3	90.7	82.0	25.2	89.5	51.5
20,001- 30,000	41.7	89.8	80.4	45.4	89.9	78.6	82.3	35.5	66.7	50.5
30,001- 40,000	38.7	90.4	90.0	35.7	68.4	75.0	67.3	6.4	40.0	45.4
40,001- 50,000	49.6	92.1	94.5	43.6	79.8	95.1	74.4	22.1	24.8	53.0
50,001- 75,000	36.3	89.1	88.6	26.3	83.6	70.7	45.0	16.3	37.5	44.5
75,001- 100,000	39.0	84.2	74.1	23.5	79.1	63.3	37.7	11.3	37.2	43.1
100,001- 150,000	26.7	74.9	84.4	22.5	70.0	72.2	42.7	7.4	21.3	35.4
150,001- 200,000	27.4	75.4	71.6	37.4	71.9	86.5	48.0	8.9	18.9	38.6
200,001- 300,000	17.8	70.9	82.5	18.4	41.5	56.1	26.7	3.3	7.8	26.4
300,001- 400,000	16.1	69.5	71.1	19.0	30.0	21.6	17.8	0.9	1.5	27.4
400,001- 500,000	10.3	42.4	47.0	16.4	24.3	36.0	3.5	7.2	4.9	21.1
500,001- 750,000	9.3	46.9	55.9	13.9	12.2	3.4	7.7	1.3	0.6	21.2
750,001-1,000,000	8.6	30.4	37.4	15.8	22.4	11.9	3.5	1.5	4.1	17.0
1,000,001-.....	18.3	36.4	37.8	8.9	30.8	10.5	2.3	3.1	1.7	21.0
All cities	24.6	51.8	49.4	23.6	44.8	38.0	28.8	6.9	6.7	29.6

per 100,000 population is indicated in Table 12. As for receipts in mixed carloads of vegetables under consideration, those of the smaller markets were decidedly heavier than those of the larger markets. Relatively, the mixed carload played a more important role in distribution of vegetables to the small markets than it did to the large. The greater portion of volume of such vegetables as carrots, beets, beans, and spinach reached the smaller markets through the mixed carload.

It is manifest that no hard and fast division obtains between what may be termed mixed carload markets and straight carload markets. Mixed and straight carload markets for cabbage are nearly identical. Furthermore, it is evident that "small markets" just able to absorb straight carloads differ widely as between the various vegetables. While the statement cannot be made that mixed carloads are loaded exclusively for the small

Table 12. Receipts of vegetables per 100,000 population in mixed and straight carloads according to size of cities. Averages for five-year period, 1926-27 to 1930-31.

Size of cities	Total		Cabbage		Potatoes		Tomatoes		Carrots		Corn		Beets		Onions		Beans		Spinach	
	Mxd. <sup>1</sup>	St. <sup>2</sup>	Mxd.	St.	Mxd.	St.	Mxd.	St.	Mxd.	St.	Mxd.	St.	Mxd.	St.	Mxd.	St.	Mxd.	St.	Mxd.	St.
Up to 40,000	37.5	32.6	17.0	21.6	4.6	5.2	1.4	4.3	4.9	0.5	0.3	0.2	1.0	0.2	2.2	0.5	1.4	0.2	1.1	0.1
40,001 to 150,000	21.4	26.5	6.6	12.4	2.2	6.0	0.7	4.8	5.0	1.1	0.3	0.7	1.4	0.3	0.7	0.8	1.1	0.3	1.0	0.1
150,001 to 300,000	20.0	40.4	5.1	19.7	2.4	7.8	0.3	5.0	4.7	1.8	0.4	3.1	1.6	0.5	0.4	0.9	1.7	1.5	0.8	0.2
300,001 to 1,000,000	12.0	40.6	1.9	15.7	1.0	5.1	0.1	5.5	4.4	5.8	0.1	2.6	2.3	2.4	0.1	1.2	0.6	1.8	0.3	0.4
1,000,001 and over	9.3	28.1	1.9	8.5	0.2	2.4	0.1	3.8	2.9	5.1	0.1	3.2	1.9	3.1	0.0	1.1	0.3	0.6	0.1	0.4
All cities	15.8	33.8 <sup>3</sup>	4.4	13.5	1.4	4.6	0.3	4.6	4.1	3.8	0.2	2.4	1.8	1.8	0.4	1.0	0.8	0.9	0.5	0.3

<sup>1</sup>All mixed.<sup>2</sup>Straight carloads of nine commodities included in this table.<sup>3</sup>All straight.



markets, the statement can be made that many vegetables grown in the Lower Rio Grande Valley through the mixed carload reach many small markets not touched by straight carload shipments. An added complication in the distinction between mixed and straight carload markets may arise from the nature of the mixed carload. The distinction between mixed and straight carloads is not as clear-cut as might be supposed. A mixed carload of two commodities is more akin to a straight carload than to a mixed carload of, say, seven or more commodities. Many of the carloads of two or three commodities are loaded heavily to one commodity and thus are very much like a straight carload of that vegetable. According to the sample in 1926-27, the vegetable of greatest volume in 38 per cent of the total mixed carloads accounted for more than 70 per cent of the total volume in such carloads; in 1930-31, the vegetable of greatest volume in 25 per cent of the total mixed carloads accounted for more than 70 per cent of the total in such carloads. The two-commodity carloads, beets and carrots mixed, is decidedly a large-market mixture.

#### **Mixed Carload Adaptable for Shipment to Large Cities**

Of cities receiving mixed carloads during the period 1926-27 to 1930-31, those with a population over 150,000 represented 75 per cent of the total population and received 41 per cent of total shipments of mixed carloads; those with a population over 500,000 represented 51 per cent of the total population and received 31 per cent of the total number of mixed carloads. It is obvious that large cities make up a large proportion of the consuming capacity.

The more important reasons for shipments of mixed carloads to the large cities may be stated as follows:

1. Mixed plantings of vegetables in the Lower Rio Grande Valley are prevalent. While for years, mixed plantings have been advocated by shippers and cooperative marketing associations as the means of developing a profitable mixed carload movement, after the mixed plantings have been established, they in turn have become a potent cause for loading of mixed carloads. Shippers have access to a wide variety of vegetables in their immediate vicinity. It becomes more convenient to load out a considerable volume in mixed carloads, more than the small markets can absorb, rather than to attempt to load the bulk of these vegetables in straight carloads. This inducement to load mixed carloads is one explanation for the heavy offering to the trade of mixed carloads by shippers through their brokerage connections.

2. Shipments to large markets facilitate the role of mixed carloads as the means of introducing new vegetables. When an area begins to produce a new vegetable, resistance is always met in the markets even though this vegetable is already being accepted from other producing areas. The chances of finding acceptance are much greater in the large markets than in the small. The small quantities of the new vegetables which the shipper may offer in the mixed carload reduce marketing risks. In cases of this

kind, shippers often consign such vegetables even though the mixed carload as a whole may have been sold F.O.B. and thus remove all risks on the part of receivers.

3. Relatively large markets may be less than straight carload markets for the specialty vegetables. Only the very largest markets can take such vegetables as anise, escarole, parsley, mustard greens, and broccoli to advantage in straight carloads. When such vegetables are loaded in mixed carloads, for the larger markets, such standard vegetables as cabbage, carrots, and beets are used to complete the load. This accounts for the fact that a considerable volume of vegetables otherwise in the straight carload class, moves in mixed carloads.

4. Small supplies of vegetables are available at the opening of the shipping season. When the shipping season opens, growers and shippers desire to make shipments to the markets at the earliest possible date. Early in the season supplies of the various vegetables in condition fit to ship are limited, making difficult the assembling of straight carloads. A decided advantage of the mixed carload lies in the fact that it makes the small supplies go farther in the sense of making possible the reaching of more markets. Shippers use the mixed carload, particularly in the case of the large markets, as the means of announcing to the trade that the new shipping season is getting under way.

5. Mixed carloads insure vegetables of greater freshness in the markets. Receipts of a given vegetable in straight carload lots may mean that several days will be required before the supply can be disposed of. In the case of the more perishable vegetables, this delay may result in deterioration of quality. Receipts of the same vegetable in smaller quantities in the mixed carload mean that the supply can be turned more rapidly. The difference between straight and mixed carloads may be a matter of receipts once a week of the former and several times a week of the latter.

6. Large markets receive mixed carloads not accepted in the small markets. A shipper may have an F. O. B. carload rejected in a small market. In such an instance, about his only opportunity of disposing of the carload will be that of consignment to one of the larger markets. Some shippers follow the practice of loading mixed carloads without orders. Since more than 90 per cent of the mixed carloads shipped to the small markets are on F. O. B. orders, about the only outlet for the non-order carloads will be to the larger markets.

7. The mixed carload is a desirable unit for direct receipt by the jobber. In the regular marketing system, carload lots are received by the so-called carlot receiver. He, in turn, sells in less than carload lots to the jobber; the jobber then sells to the retailer. So far as the jobber is concerned, the mixed carload may be so loaded as to give him the various vegetables in just the size-lots desired. The jobber by direct receipt eliminates the carlot receiver. Unquestionably, in many of the more important markets, the efforts of jobbers to go around the carlot receiver has been a factor in popularizing the mixed carload.

8. The mixed carload is advantageous to the carlot receiver. In assembling variety needed to offer jobbers, the carlot receiver finds the mixed carload possessing a high degree of flexibility. In a few mixed carloads, he may receive as many different kinds of vegetables as would require a great number of straight carloads. The relation between the volume of the various vegetables can be adjusted more easily through the mixed than the straight carload. To the extent that the carlot receiver caters to the trucker moving produce to outlying markets in the trade area, the mixed carload offers the necessary mixture on a comparatively small platform space as contrasted with the straight.

9. The mixed carload reduces marketing risks to carlot receiver. Prices of the various vegetables may vary widely within short periods of time. The chance of loss on straight carloads is considerable. Through the variety of vegetables received in the mixed carload, the receiver diversifies his risks. Furthermore, produce dealers make much of the point that as one or two vegetables in a market are usually in keen demand, such vegetable or vegetables in a mixed carload help to sell the others.

10. Grower-dealer shipments are facilitated by mixed carloads. A dealer in a large market growing his own vegetables in the Lower Rio Grande Valley often loads mixed carlots rather than straight, largely as a matter of convenience. On a given day, a certain number of straight carloads of such vegetables as cabbage, carrots, beets, parsley, broccoli, and the like are desired. It may be of small concern whether these vegetables are loaded in straight carloads or equivalents in mixed carloads. As harvesting progresses for the different vegetables, the completing of a given carload with some other vegetable than the one being loaded may prove advantageous.

11. Mixed carload shipments to the large markets serve as a balance wheel in keeping in proper adjustment movements to the small markets. A shipper specializing in mixed carload shipments to the smaller markets, from time to time, finds supplies of the various vegetables accumulating on his shipping platform in excess of outlets in the small markets. The supplies of the various vegetables may be insufficient to load out straight carloads. Consequently, when such surpluses are sufficient for a carload, or two, the shipper loads them out in mixed carloads to be consigned to the larger markets.

#### Mixed Carload Shipments Possess Some Undesirable Features

Even though for a period of twenty years growers and shippers have entertained a high regard for mixed carloads, such shipments possess a number of disadvantages. The more important of these undesirable features may be stated as follows:

1. The cost of loading is high. The expense to the shipper of loading a mixed carload is higher by \$15 to \$25 than is the case with the straight carload. Assembling costs run higher. This may be particularly true for vegetables of minor importance wanted in small quantities. More

details are involved in loading the various vegetables according to specified quantities. After accepting an order, a shipper may find that he cannot load some of the vegetables desired, or in the particular quantities wanted; or the order may be such as to make impossible loading up to minimum weight requirements. In either event, the shipper needs to get in touch with the receiver, usually through the use of telegrams. This adds to the costs. Even in such a matter as shipping point inspections, fees are higher for the mixed than for the straight carload.

2. The content of the mixed carload is not readily ascertained. The elaborate system which has been developed by the Market News Service of the United States Department of Agriculture in compiling data on shipments of the various vegetables as to such matters as volume, time of shipment, prices, and destinations presumes such data of economic significance to growers, shippers, dealers, and consumers. To the extent that shipments are made in mixed carloads, the accuracy of data on shipments of vegetables is impaired. The mixed carload makes more difficult the work of the crop reporting service. Furthermore, the mixed carload may offer shippers and receivers an opportunity to cover up shipments of specific vegetables whatever may be the motive for so doing. For instance, a loading of 360 crates of carrots and 8 crates of beets is virtually a straight carload of carrots. Still, in statistics on vegetable shipments, it will appear as either beets and carrots mixed, or as simply mixed.

3. Maintenance of quality of the various vegetables in the mixed carload is difficult. Even though, in general, a group of vegetables may be fitted for shipment in the same carload, in actual practice a few of these vegetables may suffer deterioration in quality under conditions conducive to maintain the quality of the other vegetables.

4. The order in which vegetables are loaded in the mixed carload should be such as to serve the convenience of the receiver. Upon receipt of a mixed carload, the receiver often finds that he wants one or two vegetables first. If such vegetable, or vegetables, are loaded near the door, all is well; but if in the extreme end of the carload, then a large portion of the carload must be unloaded to get at the desired vegetables. Even though the receiver tries to anticipate demand and gives instructions as to the order of loading, his calculations may be upset by a change in demand by the time the carload arrives.

5. Difficulties arise in diverting mixed carloads. The shipper on his F. O. B. transactions always assumes the risk of rejection, for one reason or another, on the part of the receiver. The problems connected with the diversion of the mixed carload are more intricate than with the straight.

6. The mixed carload complicates a program of prorated shipments. If under a program of controlled production and marketings of agricultural commodities, steps should be taken to prorate shipments of, say, cabbage and potatoes from the Lower Rio Grande Valley, such control would be greatly complicated by shipments in the mixed carload. The effectiveness of control over straight carload shipments of these commodities might be entirely destroyed through shipments in mixed carloads. Any program of

proration, therefore, would have to include mixed carload shipments. This would involve a check on all mixed carloads as to quantities of these vegetables loaded and as to destinations.

### Mixed Carload Sales Predominantly F. O. B. in Small Markets

The relationships between types of sales, varieties of vegetables in the mixed carload, and size of cities are shown in Table 13. It is to be noted that as the size of cities increases, the relative importance of the few commodity mixed carloads increases except in the case of the largest

Table 13. Receipts and type of sales of mixed carloads according to number of vegetables and size of cities. Shipping season, 1930-31.

Size of cities	Percentage of total according to number of vegetables in carloads		Percentages according to types of sale for carloads of 2, 3, and 4 commodities		Percentages according to types of sale for carloads of five commodities and over	
	2, 3, & 4 commodities	Five commodities and over	F.O.B. sales	Delivered sales	F.O.B. sales	Delivered sales
Up to 40,000	26.6	73.4	85.2	14.8	93.0	7.0
40,001 to 150,000	41.2	58.8	72.6	27.4	86.3	13.7
150,001 to 300,000	56.3	43.7	77.0	23.0	82.2	17.8
300,001 to 1,000,000	73.7	26.3	58.2	41.8	57.5	42.5
1,000,001 and over	64.2	35.8	59.7	40.3	35.6	64.4
All cities	47.8	52.2	70.6	29.4	82.5	17.5

group. In meeting daily requirements in the smaller cities, the individual mixed carload plays an important role. Hence variety is one of its essential attributes. In the larger cities, the single mixed carload is of much less importance in that daily requirements are met by receipts of numerous carloads, both mixed and straight. Hence variety is of much less significance.

As the size of cities increases, the relative importance of F. O. B. sales consistently decreases. For the smaller cities, F. O. B. sales run relatively high for mixed carloads of many commodities; for the larger cities, relatively high for mixed carloads of few commodities. In the case of the smaller markets, the shipper takes less hazards in consigning mixed carloads of few than of many commodities. Mixed carloads of few commodities are usually made up of such vegetables as cabbage, carrots, beets, potatoes, onions, and turnips. The demand for these vegetables is rather constant and consistent from one market to another. That is, a mixed carload of this type loaded for one market will generally very nearly fill the requirements of other markets. On the other hand, a mixed carload of many commodi-

ties usually contains one or more vegetables from what may be termed the specialty class. Demand for specialty vegetables is rather erratic as between the different small markets. That is, a loading to meet the requirements of a specific market, may fail to meet the requirements of other markets. In the case of the larger markets, the dealer ordering a mixed carload usually desires such vegetables as parsley, broccoli, mustard greens, and turnip greens in such volume as to fill a carload with but a few commodities. Many of the mixed carloads shipped to the large markets are loaded from surplus accumulations on the shipper's platform. Variety is a usual characteristic of such accumulations. As has already been indicated, these carloads are generally consigned.

The relative merits of F.O.B. and Delivered sales have been for many years a matter of continual interest to growers and shippers in the Lower Rio Grande Valley. In this controversy, growers have usually been decidedly in the favor of the former. One of the strongest arguments advanced in support of the mixed carload has been based on the fact that in the case of such shipments, F. O. B. sales are of relatively greater importance than in the case of straight.

#### SUMMARY

For the twenty-one shipping seasons ending with 1930-31, mixed carloads have accounted for 29 per cent of all carload shipments of vegetables from the Lower Rio Grande Valley. While a total of 36 vegetables were included in mixed carload shipments during the period, 1926-27 to 1930-31, cabbage, carrots, beets, potatoes, and green beans made up nearly 80 per cent of the total volume. Chief characteristics of a vegetable important in mixed carload shipments are: 1. Long marketing season. 2. Large and stable demand. 3. Suitability to mixing with other vegetables in the same carload. 4. Marketing season concurrent with that of numerous other vegetables.

Mixed carloads play a prominent role in distribution of vegetables from the Lower Rio Grande Valley to cities in the United States and Canada through the whole range of sizes from 2,000, and even less, to the largest. The relative importance of mixed carloads decreases as size of cities increases. During the five-year period, 1926-27 to 1930-31, cities of 40,000, or less to which mixed carloads were shipped, received an equivalent of 37.5 carloads per 100,000 population in mixed carloads and cities of 1,000,000, or more, 9.3 carloads.

As size of cities increases, the relative importance of cabbage decreases and of carrots and beets increases in mixed carloads. Cabbage is used extensively in shipments to small markets as the commodity for completing the load. That is, the carlot receiver specifies the quantities of the various vegetables desired and then indicates that the rest of the carload be loaded with cabbage. Carrots and beets assume largely this role in shipments to large cities.

As between straight and mixed carload receipts, small markets receive a very large proportion of such vegetables as carrots, beets, potatoes, green beans, and spinach in mixed carloads; and large markets such vegetables as broccoli, parsley, peppers, endive, anise, and collards. The mixed carload has been a factor in expanding the outlet for staple vegetables in the small markets and for specialty vegetables in the large markets.

Among the various reasons for mixed carload movement to large markets may be mentioned: relatively large markets may be less than straight carload markets for specialty vegetables; the mixed carload insures vegetables of greater freshness through more frequent delivery; the shipper loading a mixed carload from accumulations of vegetables on his shipping platform has practically no alternative but to consign such shipments to a large market; the mixed carload may be a desirable unit for direct receipt by the jobber; and the mixed carload enables the carlot receiver to assemble a desired variety of vegetables in fewer carloads than would be possible in straight carloads.

Costs of loading a mixed carload are somewhat greater than those of loading a straight carload. The order of loading a mixed carload may not conform to the preference of the carlot receiver at time of receipt. Diversion of mixed carloads in case of rejection is not easily effected. A program of controlled shipments is complicated by mixed carload 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. A much larger proportion of mixed carloads are consigned to the large markets than to the small. Many of these consigned carloads originate from one of two sources: (1) mixed carloads rejected in small market; (2) mixed carloads loaded from accumulations on the shipper's platform: such carloads do not conform to the exacting demand in the small markets.

Motor truck shipments have largely supplanted mixed carload shipments in two distinct areas: to markets within trucking distance of the Lower Rio Grande Valley; and to markets within trucking distance of the large distributing centers.

Three rules, in the main, are now in effect governing minimum weights of mixed carloads. This is both confusing and unsatisfactory. To keep all markets open, a shipper must load a minimum according to that of the vegetable, or vegetables, in the mixture having the higher, or highest, minimum. A standardization of the 25 per cent rule, the vegetable in the mixture having the highest minimum setting the minimum for the carload in case it makes up 25 per cent or more of the total weight, would be of material benefit to growers and shippers of the Lower Rio Grande Valley.

The mixed carload has been an important factor 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 carload. 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 desiring to move in the direction of greater diversification will find the mixed carload a most useful instrument in accomplishing such a purpose.