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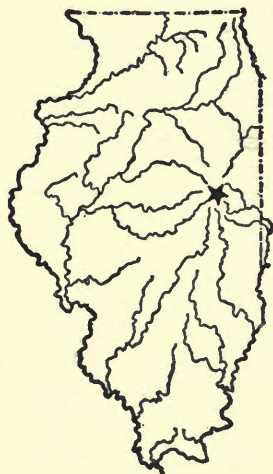
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BULLETIN No. 324

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SEASONAL FEATURES OF ILLINOIS  
GRAIN MARKETING

By L. J. NORTON AND C. L. STEWART



URBANA, ILLINOIS, MAY, 1929

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# SEASONAL FEATURES OF ILLINOIS GRAIN MARKETING

By L. J. NORTON, Assistant Chief in Agricultural Economics  
and C. L. STEWART, Chief in Agricultural Economics

Illinois farmers market so large a proportion of the corn, oats, and wheat sold in the United States that the time of the year when these products move from the country is important to producers, dealers, and consumers alike. As indicated in a companion publication, "Market Destinations of Illinois Grain";<sup>1</sup> shipments of corn, oats, and wheat from Illinois country points amount to about 215 million bushels annually, or to about 15 percent of the marketings of the entire country.

The present bulletin gives information as to the season of the year when local Illinois dealers ship grain. The data gathered cover the crop years 1923-24, 1924-25, and 1925-26, and indicate the reactions of farmers and grain dealers to price and other conditions which prevailed during those three years. The only sources of information which have been available heretofore relative to the time that grain is marketed are the estimates of the U. S. Department of Agriculture as to the percentage of different crops marketed by farmers during different months and the trade reports of grain received at the larger primary markets.

Some of the practices of Illinois farmers and grain dealers relative to season of marketing grain, shown in this publication, represent general practices carried out year after year, while others indicate merely reactions to the conditions of this particular period. Interesting differences are revealed in the rapidity with which various grains are marketed after harvest. There are also differences in the rate and in the season of marketing the same grain in different sections of Illinois. The data suggest that farmers regulate the time of marketing to some extent according to the price situation.

## SCOPE OF STUDY

Part of the data for 1923-24 and 1924-25 were obtained from the books of elevator companies by representatives of the Experiment Station, and part from questionnaires filled out by managers of Illinois elevators. Both farmers' organizations and privately-owned businesses were included in this study. In all, data were obtained from approximately 280 Illinois elevators regarding the number of

<sup>1</sup>Ill. Agr. Exp. Sta. Bul. 315. 1928.

cars of corn, oats, and wheat which they had shipped each month from July, 1923, to June, 1925. The number of cars reported gives an idea of the scope of the study:

	1923-24 cars	1924-25 cars
Corn.....	14,356	17,571
Oats.....	6,490	8,873
Wheat.....	8,586	4,607

These total figures may be taken as a measure of the variations in shipments between the two years, as no data were included unless shipments were reported for the entire twenty-four months.

Similar data were obtained from 152 elevators for the year beginning July 1, 1925. The total shipments from the fewer elevators reporting on 1925-26 shipments cannot be directly compared with those of the two previous years, but figures showing the proportion of each year's shipments made each month may be so compared.

The figures thruout the bulletin refer to the time when the grain left country points, not to the time at which farmers sold their grain, nor necessarily to the dates when the elevators sold.

### WHEAT SHIPMENTS

The bulk of the wheat shipped by reporting elevators during the three years covered by this study was shipped out shortly after threshing time, as shown in Table 1 and Fig. 1.

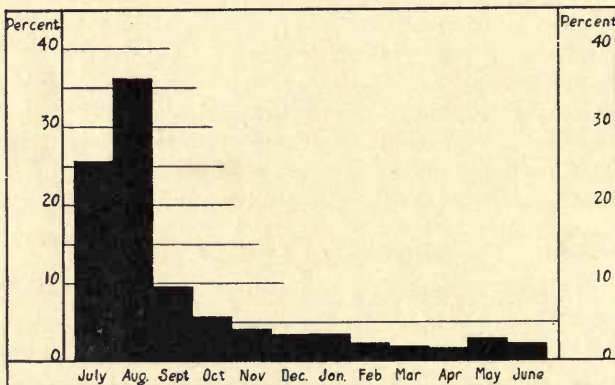


FIG. 1.—PROPORTION OF ILLINOIS WHEAT SHIPMENTS MADE IN THE DIFFERENT MONTHS OF THE YEAR

Seventy percent of the year's shipments were made between July 1 and October 1. (Graph based on data for three years, July, 1923, to June, 1926.)

TABLE 1.—PERCENTAGE OF ANNUAL CARLOADS OF WHEAT SHIPPED EACH MONTH BY ILLINOIS REPORTING ELEVATORS

Year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1923-24.....	26.6	40.0	10.1	5.4	2.7	2.0	2.7	2.4	2.1	1.7	1.9	2.5
1924-25.....	12.9	48.8	11.8	8.1	4.2	2.9	3.5	1.8	1.3	1.0	2.3	1.5
1925-26.....	37.3	20.1	7.0	4.0	5.4	5.4	4.3	3.1	2.7	2.6	4.9	3.2
Average....	25.6	36.3	9.6	5.8	4.1	3.4	3.5	2.4	2.0	1.8	3.0	2.4

On the average, a little over 60 percent of the year's shipments were made prior to October 1, the proportion varying somewhat from year to year, with a tendency toward later marketing each year of the three-year period. In 1923, 77 percent of the year's shipments were made between July 1 and October 1; in 1924, 75 percent of the year's shipments were made between these dates; and in 1925 only 64 percent of the shipments were made during this period.

This tendency toward later marketing may have been the result of smaller crops, which permitted a larger proportion of the crop to be stored, as well as of a definite choice toward later marketing during the period.

#### Sectional Differences in Season of Wheat Shipments

The season of heaviest shipment varied among the different sections, as may be seen by reference to Fig. 2 and Table 2. Wheat left country points least rapidly in the southern district and most rapidly in the central and eastern districts. The northern and western districts were comparatively slow in marketing their wheat, and the southwestern district, a heavy wheat producer, was intermediate in this respect. More detailed data are given in Tables 25 and 28 of the Appendix.

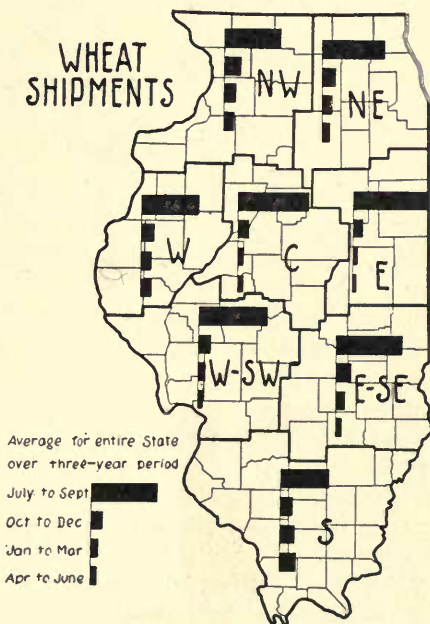


FIG. 2.—SEASONAL SHIPMENTS OF WHEAT FROM DIFFERENT DISTRICTS OF ILLINOIS

Seasonal differences in shipments are very pronounced. They are most marked in the central and eastern parts of the state and least marked in southern Illinois. (Graph based on data for three years, July, 1923, to June, 1926.)



TABLE 2.—PERCENTAGE OF ANNUAL CARLOADS OF WHEAT SHIPPED PRIOR TO OCTOBER 1 BY ILLINOIS REPORTING ELEVATORS

Crop reporting district	North-west	North-east	West	Central	East	West-south-west	East-south-east	South	State
1923-24.....	55	62	61	85	84	78	74	48	77
1924-25.....	68	70	69	79	76	71	75	61	74
1925-26.....	58	71	56	65	86	65	72	47	64
Average.....	60	68	62	76	82	71	74	52	72

### Seasonal Changes in Wheat Prices 1923 to 1926

Two distinct classes of wheat are grown in Illinois. Hard winter wheat is produced in the northern and central parts of the state and soft red winter in the southern part and in scattered areas elsewhere.

The general trend of wheat prices at St. Louis and Chicago (Table 3) was upward thruout the period for which shipment figures were obtained, at least until January, 1925. With the exception of hard wheat

TABLE 3.—AVERAGE MONTHLY PRICE OF WINTER WHEAT AT ST. LOUIS AND OF HARD WHEAT AT CHICAGO DURING SELECTED MONTHS  
(Cents per bushel)

Year	No. 2 red winter at St. Louis				No. 2 hard winter at Chicago			
	Aug.	Oct.	Jan.	April	Aug.	Oct.	Jan.	April
1923-24.....	99	116	116	113	103	112	109	108
1924-25.....	138	156	210	177	131	145	186	154
1925-26.....	172	170	194	171	162	154	182	162

in 1923, it would have paid to hold both hard and soft wheat until midwinter in each of these three years, the high point being reached in January and February. The increase in the price of soft wheat at St. Louis from August to January, as an average of the three years, was 37 cents a bushel; the average increase in the price of hard wheat at Chicago for the same period was 22 cents.

The tendency to market wheat early, as noted above, indicates either that most Illinois farmers thought it would not pay to hold their wheat or that they did not have adequate granaries or the financial resources that would permit them to do so. As a matter of fact, a more gradual rate of marketing during this particular period would have been more profitable. It should be kept in mind, however, that these three years may not have been typical. In 1926-27, the year immediately following this three-year period, no such rise occurred, the prices of both hard and soft wheat averaging higher in July than in any subsequent month.

### Usual Seasonal Changes in Wheat Prices

The question may be asked, Why did Illinois farmers in general follow a marketing policy for wheat during these three years that

did not bring them the highest price? The answer depends in part on the answer to the question suggested above as to whether the seasonal variations in price during these three years were or were not typical.

**Seasonal Changes in Hard Wheat Prices.** Average monthly prices of No. 2 hard wheat for the years 1899 to 1913 at Kansas City and for 1921 to 1925 at Chicago and Kansas City are shown in Table

TABLE 4.—AVERAGE MONTHLY PRICE OF NO. 2 HARD WHEAT AT KANSAS CITY AND CHICAGO FOR SELECTED PERIODS  
(Cents per bushel)

Period	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
Kansas City <sup>1</sup>												
1899-1913....	83	82	83	85	83	85	87	87	87	88	91	90
1921-1927....	125	124	125	127	130	134	139	139	137	136	139	133
Chicago <sup>2</sup>												
1921-1927....	131	128	127	129	130	137	141	144	141	141	144	136

<sup>1</sup>Averages of prices reported in the U. S. Department of Agriculture Yearbooks and in *Crops and Markets*.

<sup>2</sup>Averages of prices reported in the U. S. Department of Agriculture Yearbooks and in *Crops and Markets*, except for July to December, 1921, which averages are based on figures in the annual report of the Chicago Board of Trade.

4 and Fig. 3. Lack of satisfactory Chicago quotations for this class of wheat for a period of years prior to the war necessitated the use of Kansas City quotations.

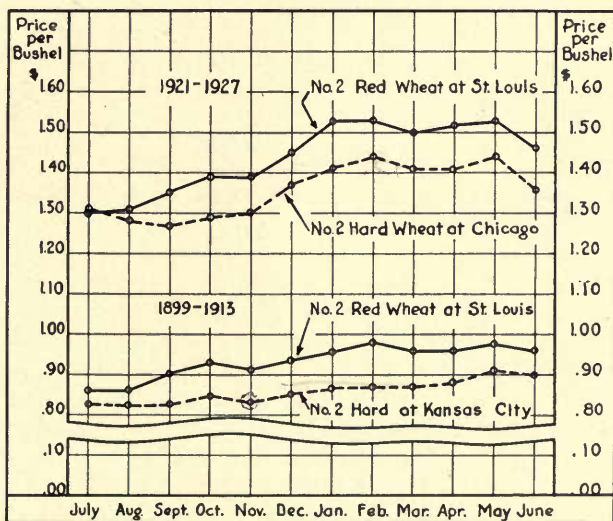


FIG. 3.—AVERAGE MONTHLY PRICE OF HARD WINTER WHEAT IN KANSAS CITY AND CHICAGO AND SOFT WINTER WHEAT AT ST. LOUIS DURING A PRE-WAR AND A POST-WAR PERIOD

The price of soft red winter wheat has shown a greater advance between harvest and midwinter than has the price of hard red winter wheat. This is true of both pre-war and post-war periods. In the post-war period (1921 to 1927) the seasonal peak in price, for both classes, usually came in January and February.

The average prices of No. 2 hard winter wheat at Kansas City for the fifteen-year period from 1899 to 1913 indicate that the price of this grade of wheat typically increased but little during the season, the average increase from July to January being 4 cents and from July to May, 5 cents. Such increases indicate that the storage of this grade of wheat would not have been very profitable during the average year. The increases would about pay interest charges and leave nothing for the use of storage space and the other costs involved in storing grain.

Changes in cents per bushel	July over June	Aug. over July	Sept. over Aug.	Oct. over Sept.	Nov. over Oct.	Dec. over Nov.	Jan. over Dec.	Feb. over Jan.	Mar. over Feb.	Apr. over Mar.	May over Apr.	June over May
Crops of 1921 - 1927												
<b>Increase</b>												
10-25												
05-10												
00-05												
None												
<b>Decrease</b>												
00-05												
05-10												
10-25												
25-50												
<b>Average</b>	\$-.07	-.02	-.01	+.02	.00	+.07	+.04	+.03	-.03	.00	+.04	-.08
<b>Cumulative from August</b>			-.01	+.01	+.01	+.08	+.12	+.15	+.12	+.12	+.16	+.08

FIG. 4.—FREQUENCY WITH WHICH CERTAIN MONTH-TO-MONTH CHANGES OCCURRED IN THE PRICE OF NO. 2 HARD WINTER WHEAT AT CHICAGO

During only one month did the price rise above the average of the previous month during these seven years; this was in December. The price commonly rose during October, January, February, and May, and declined in July, August, September, March, and June.

Prices for 1914 to 1920 are disregarded because of the unusual character of the price fluctuations. The influences of the war, price regulation, and deflation make averages based on these years of little significance.

For the more recent period, 1921-22 to 1927-28, seasonal increases have been larger than before the war, the average from July to February being 14 cents both at Kansas City and at Chicago. Both averages were materially influenced by the large increase in price in 1924. Leaving 1924 out of consideration the increases would have been 7 cents at Kansas City and 5 cents at Chicago.

The frequency of the change in price of hard wheat, and the different amounts of the changes at Chicago for the crops harvested in 1921 to 1927 are shown in Fig. 4. The changes are highly irregular except from May to August, when the price is readjusting downward to the new crop basis, and during the month of December, when the price for each of these seven years was above that of November. However,



the prevailing tendency was for the price to rise in October, December, January, February, and May, and to decline in June, July, August, September, March, and June.

**Seasonal Changes in Soft Wheat Prices.** The price of soft wheat has had a somewhat different seasonal variation from the price of hard wheat. Typical changes in price suggest that storage would prove more profitable, on the average, than in the case of the contract grades of hard wheat.

Prices of No. 2 soft red winter at St. Louis, the principal market for Illinois soft wheat, rose rather steadily, on the average, from

TABLE 5.—AVERAGE MONTHLY PRICE OF NO. 2 SOFT RED WINTER WHEAT AT ST. LOUIS<sup>1</sup> FOR SELECTED PERIODS  
(Cents per bushel)

Period	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1899-1913....	86	86	90	93	91	94	96	98	96	96	98	96
1921-1927....	130	131	135	139	139	145	153	153	150	152	153	146

<sup>1</sup>Averages of prices reported in U. S. Department of Agriculture Yearbooks and in *Crops and Markets*.

August to midwinter during both periods, but after February no significant increases took place, and in the later period, 1921-1927, with the exception of May the price averaged lower during each month after February (Table 5 and Fig. 3). The average increase between February and July was 12 cents for the earlier period and 23 cents for the 1921-1927 period. Leaving 1924 out of the consideration, the average increase in the later period was reduced to 16 cents.

From 1899 to 1913 there was only one year in which the February average was lower than the August average, and during eight of these years the increase was 10 cents or more per bushel. In the more recent period, 1921-1927, the February price was at least 14 cents a bushel higher than the August price during six of these seven years. In 1926 the increase was only 1 cent. There was a large crop of soft wheat in 1926 and the general trend of wheat prices was downward.

The amount of change from one month to the next varied from year to year. The frequency with which changes of different amounts occurred is shown in Fig. 5 for the two periods 1899-1913 and 1921-1927. During both periods the price in September, October, December, and January was typically above that of the preceding month, while in November it was lower than October more frequently than it was above October. After January or February the price declined more often than it advanced, altho in the earlier period the May price was frequently higher than the April price.

Green and Stokdyk<sup>1</sup> have shown, with respect to hard wheat at Kansas City, that the trend in prices from July to September is a good index of the price changes that are likely to take place during

<sup>1</sup>Kans. Agr. Exp. Sta. Circ. 54. 1927.

the following months. This is true also for soft wheat at St. Louis. From 1899 to 1926, omitting the years when the government fixed prices, there were fifteen years when the price advanced between July and September and ten years when it declined. During the fifteen years of advancing prices, the median increase (an average computed to eliminate influence of years with large irregular changes) was 8

Changes in cents per bushel	July over June	Aug. over July	Sept. over Aug.	Oct. over Sept.	Nov. over Oct.	Dec. over Nov.	Jan. over Dec.	Feb. over Jan.	Mar. over Feb.	Apr. over Mar.	May over Apr.	June over May
Crops of 1899 - 1913												
<b>Increases</b>												
10-25												
05-10												
None												
<b>Decreases</b>												
00-05												
05-10												
10-25												
25-50												
Average	\$-.08	.00	+.04	+.03	-.02	+.01	+.02	+.02	-.02	.00	+.02	-.02
Cumulative increases from August			+.04	+.07	+.05	+.06	+.08	+.10	+.08	+.08	+.10	+.08
Crops of 1921 - 1927												
<b>Increases</b>												
25-50												
10-25												
05-10												
00-05												
None												
<b>Decreases</b>												
00-05												
05-10												
10-25												
25-50												
Average	\$-.12	+.01	+.04	+.04	.00	+.06	+.05	.00	-.03	+.02	+.01	-.07
Cumulative increases from August			+.04	+.08	.00	+.14	+.22	+.22	+.19	+.21	+.22	+.15

FIG. 5.—FREQUENCY WITH WHICH CERTAIN MONTH-TO-MONTH CHANGES OCCURRED IN THE PRICE OF NO. 2 SOFT RED WINTER WHEAT AT ST. LOUIS

The month-to-month changes in price of this class of wheat vary considerably from year to year. There has been, however, a rather definite tendency for the price to decline in November as compared with October, and for it to increase in September, October, December, January, and May as compared with the previous month.

cents a bushel from September to January. The price declined during the September-January period only two of the fifteen years. During the ten years when prices declined between July and September, the median increase between September and January was 2.5 cents. A decline occurred in the September-January period during three of the ten years. The trend in price up to September has been a fair index of the trend from September to January.



### Comparative Rise in Seasonal Prices of Hard and Soft Wheat.

Soft wheat prices have typically increased more between harvest and midwinter than have hard wheat prices. From 1899 to 1913 the average increase in the price of soft wheat at St. Louis between July and February was 12 cents, while for the same period the rise in the price of No. 2 hard winter wheat at Kansas City was 4.5 cents; from 1921 to 1927 the rise in soft wheat was 23 cents, compared with 14 cents for hard wheat both at Chicago and at Kansas City. In each case the increase for soft wheat was about 10 cents more than the increase for hard wheat. The differences in the two thruout the year are shown graphically<sup>1</sup> in Fig. 3. It should be kept in mind that this refers to the contract grade of hard wheat and not to premium grades, the seasonal variations in the price of which may have been different.

What explanation is there for this difference in price behavior between hard and soft wheat?

The difference in the method of disposal may be the explanation. This type of hard wheat is exported to a greater extent than is soft wheat and must be sold on the basis of the export market. The competition which this wheat meets from a succession of crops harvested at later dates tends to keep the price from advancing. Another factor which tends to raise prices at harvest time for wheat to be exported is the availability of water routes during the summer months for moving hard wheat a portion or all of the distance to the seaboard.

The annual exports of these two classes of wheat from the United States for the 1922 to 1926 crops, averaged for hard red winter wheat 55,631,000 bushels, and for soft red winter wheat, 15,647,000 bushels.<sup>1</sup> These quantities represent 19 percent of the estimated production of hard red winter wheat and 7 percent of the estimated production of soft red winter wheat. The exports of soft wheat during the 1926 season rose to 15 percent of the crop, or to about twice as large a percentage as the average of the period. The necessity of making these large exports in order to dispose of the crop probably accounts for the failure of the price to rise by the normal amount.

Soft wheat is more largely consumed in this country. It is natural, therefore, for the price to advance on the average during the season by an amount sufficient to cover the costs of storage. This suggests that if the United States should cease to export any class of wheat, the seasonal variation of that class would tend to become more like that of soft wheat. This situation actually develops at intervals with certain classes of wheat, because of variations in production from year to year or because of over-exporting early in the season.

<sup>1</sup>Computed from data in *Foreign News on Wheat*, Bureau of Agricultural Economics, U. S. Department of Agriculture.

The amount of the increase which typically takes place in the price of soft wheat between harvest time and midwinter might be reduced if farmers or farm organizations made a concerted effort to store or to hold back from the market more of this class of wheat at harvest time. If this were to happen, the storage operation might prove unprofitable even tho the yearly average price were increased by these operations. However, since there are certain definite costs involved in storing wheat,<sup>1</sup> it is likely that over a period of years there will be a persistent tendency for the midwinter prices of soft wheat to be higher than the harvest-time prices. This is likely to be true also of other classes of wheat consumed largely in the domestic market but will not hold for those which continue to be exported.

### Relation of Class of Wheat Produced to Season of Marketing

It was noted above (page 5) that in the southern part of Illinois wheat left country points more slowly than in the central counties. The wheat in this southern section is soft, while in the central counties it is mainly hard. The tendency for soft wheat to rise in price more than hard wheat may explain this difference in shipping practice. It is not uncommon for farmers producing two types of wheat to sell the hard wheat at harvest time and hold the soft wheat for the premiums which they expect to obtain at a later date.

### CORN SHIPMENTS

Shipments of corn increased during the three-year period covered by this study. The 281 reporting elevators shipped 3,000 more cars of corn in the twelve months from July, 1924, to June, 1925, than during the previous twelve months, or an average of about 10 more cars

TABLE 6.—PERCENTAGE OF ANNUAL CARLOADS OF CORN SHIPPED EACH MONTH BY ILLINOIS REPORTING ELEVATORS

Year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1923-24.....	8.3	6.4	8.2	6.2	11.1	5.4	13.0	11.6	5.5	6.0	7.7	10.4
1924-25.....	8.4	5.1	8.5	8.7	10.2	14.8	17.0	6.1	5.6	3.2	6.6	5.8
1925-26.....	4.3	9.3	8.0	8.0	11.7	13.6	11.0	7.5	5.5	3.4	6.5	11.2
Average...	7.0	6.9	8.2	7.6	11.1	11.3	13.7	8.4	5.5	4.2	6.9	9.1

each. The average shipment made by reporting elevators in the central and eastern districts was 70 cars in 1923-24, 83 cars in 1924-25,

<sup>1</sup>Costs of storage include such items as interest on money tied up in the grain, insurance, shrinkage, risks of destination, cost of providing storage space, and the risks of price changes. The practice followed by certain writers of figuring the cost of providing storage space at the rate provided for the public storage of grain in terminal markets is incorrect since most grain is stored in the property owned or leased by the storing agency whether it is on the farm, at the country elevator, or in the terminal market.

and 103 cars in 1925-26. The monthly distributions of these shipments each year is shown in Table 6 and Fig. 6. Detailed data by sections of the state are given in Tables 26 and 29 of the Appendix.

Shipments of corn were more uniformly distributed thruout the year than were shipments of wheat. The seasonal peak in corn shipments occurring in December and January was noticeable in all three

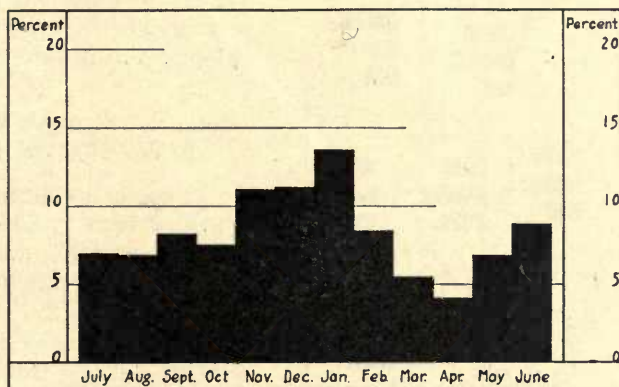


FIG. 6.—PROPORTION OF ILLINOIS CORN SHIPMENTS MADE IN THE DIFFERENT MONTHS OF THE YEAR

Shipments of corn were much more uniformly distributed thru the year than were shipments of wheat. A seasonal peak is to be noted during November, December, and January. Shipments were at a minimum in the early spring months, March and April. (Graph based on data for three years, July, 1923, to June, 1926.)

years, but it was not so marked as was the harvest-time peak in wheat shipments. The distribution of corn shipments by four-month periods is indicated on a percentage basis in Table 7.

TABLE 7.—PERCENTAGE OF ANNUAL CARLOADS OF CORN SHIPPED DURING FOUR-MONTH PERIODS BY ILLINOIS REPORTING ELEVATORS

Year	July to October	November to February	March to June
1923-24.....	29.1	41.1	29.6
1924-25.....	30.7	48.1	21.2
1925-26.....	29.6	43.8	26.6
Average.....	29.8	44.3	25.8

About 30 percent of the year's shipments were made from July to October, 44 percent from November to February, and 26 percent between March and June. These percentages did not vary much from year to year, altho in 1924-25 shipments from November to February were relatively larger than in either the preceding or the following year.



### Sectional Differences in Season of Corn Shipments

Corn was shipped earlier in the southern part of the state than in any other (Fig. 7). Over 60 percent of the relatively small shipments from the southern part of the state were made between November and March; in other sections about 40 percent was shipped during this time.

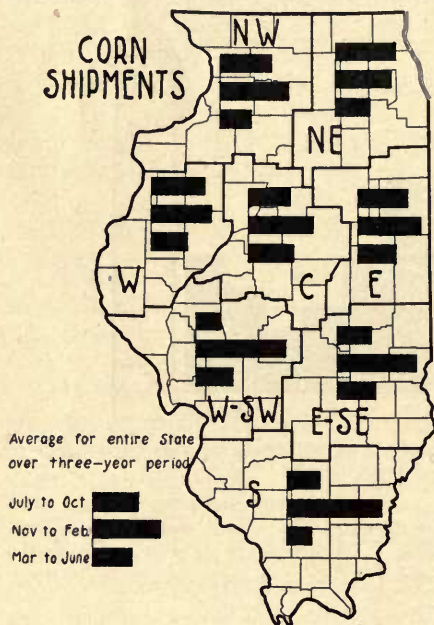


FIG. 7.—SEASONAL SHIPMENTS OF CORN FROM DIFFERENT DISTRICTS OF ILLINOIS

In the northern half of the state corn shipments are rather uniformly distributed thru the year. In the southern half of the state shipments tend to be concentrated immediately after harvest. (Graph based on data for three years, July, 1923, to June, 1926.)

### Seasonal Changes in Corn Prices 1922 to 1926

The average prices of No. 3 yellow corn at Chicago for selected months during the three years of this study are shown in Table 8.

Prices increased sufficiently during the 1922-23 crop year to pay costs of storage. They did the same in 1923-24 but failed to do so during 1924-25 or 1925-26. Very little shrinkage needs to be considered in this comparison because No. 3 corn, the grade to which the prices refer, has a limited range of moisture content. The only significant variation in the season of marketing made during the three years studied was the relatively heavier marketing during the winter of 1924-25. This was a profit-

TABLE 8.—AVERAGE MONTHLY PRICE OF NO. 3 YELLOW CORN AT CHICAGO DURING SELECTED MONTHS (Cents per bushel)

Year	Average of December and January	April	July	October
1922-23.....	72	79	88	104
1923-24.....	72	77	109	110
1924-25.....	122	105	108	82
1925-26.....	78	71	78	77

able shift in practice, as the best market of the year was during the winter.

### Usual Seasonal Changes in Corn Prices

Average monthly prices of corn for the fifteen years ending October, 1914, and for the eight years ending October, 1928, are shown in Table 9 and Fig. 8.

TABLE 9.—AVERAGE MONTHLY PRICE OF NO. 3 YELLOW CORN AT CHICAGO<sup>1</sup>  
DURING TWO PERIODS  
(Cents per bushel)

Period	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1899-13.....	52	49	49	50	51	54	57	58	59	63	62	59
1920-27.....	78	78	78	79	78	78	83	84	89	90	86	83

<sup>1</sup>Averages are based on prices reported in U. S. Department of Agriculture Yearbooks and in *Crops and Markets*.

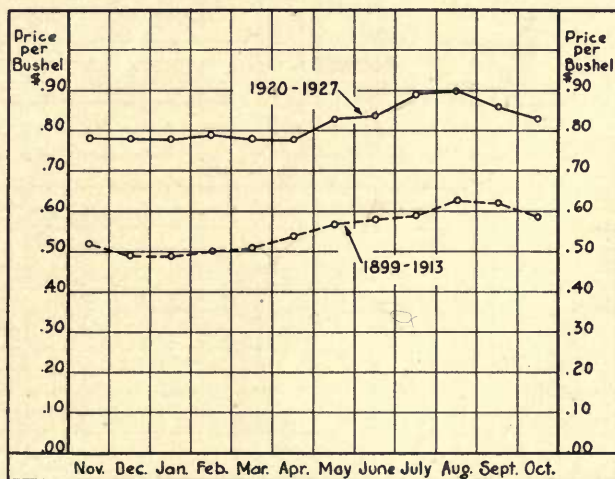


FIG. 8.—MONTHLY AVERAGE PRICE OF NO. 3 YELLOW CORN AT CHICAGO  
DURING A PRE-WAR AND A POST-WAR PERIOD

Before the World War the price of No. 3 yellow corn advanced steadily, on the average, from December to August, but in the period since 1920 the price, on the average, has not increased prior to April.

Interpretation of seasonal changes in corn prices is complicated by the changes that take place in moisture content. In the averages shown above, prices of the same grade of corn are compared, but what the exact range in moisture content of that grade was prior to the introduction of the federal grain standards is uncertain. The price of No. 3 corn at Chicago for the period from 1899-1900 to 1913-14

averaged 9 cents higher in June and 12 to 13 cents higher in September than in the preceding January. Such increases would have more than paid the costs of farm storage except for losses due to shrinkage. Just how much shrinkage should have been allowed is not certain because the grade was not defined very precisely and the factors determining the grade may have changed somewhat between seasons.<sup>1</sup>

Changes in cents per bushel	Nov. over Oct.	Dec. over Nov.	Jan. over Dec.	Feb. over Jan.	Mar. over Feb.	Apr. over Mar.	May over Apr.	June over May	July over June	Aug. over July	Sept. over Aug.	Oct. over Sept.
Crops of 1899 - 1913												
Increases												
10-15												
05-10												
03-05												
00-03												
None												
Decreases												
00-03												
03-05												
05-10												
10-15												
Average	\$-.04	-.03	.00	+.01	+.01	+.03	+.03	+.01	+.01	+.04	-.01	-.03
Cumulative increases from December			.00	+.01	+.02	+.05	+.03	+.09	+.10	+.14	+.13	+.10
Crops of 1920 - 1927												
Increases												
Over 25												
15-25												
10-15												
05-10												
03-05												
00-03												
None												
Decreases												
00-03												
03-05												
05-10												
10-15												
15-25												
Average	\$-.04	.00	.00	+.01	-.01	.00	+.05	+.01	+.05	.01	-.04	-.03
Cumulative increases from December			.00	+.01	.00	.00	+.05	+.06	+.11	+.12	+.06	+.05

FIG. 9.—FREQUENCY WITH WHICH CERTAIN MONTH-TO-MONTH CHANGES IN PRICE OF No. 3 YELLOW CORN AT CHICAGO HAVE OCCURRED

Before the World War the price of corn advanced regularly from one month to the next from January to August, altho not by uniform amounts during each year. Since 1920 the month-to-month changes have been too irregular to indicate any definite tendency.

The amount of the change in corn prices from one month to the next has varied widely. The frequency with which price changes of different amounts have taken place is shown in Fig. 9.

<sup>1</sup>For more complete discussion see Bulletin 295 of this Station, Costs of Storing Corn on the Farm. 1927.



From 1899 to 1913 the price of corn ordinarily increased quite uniformly from December to August and declined after that date. During these fifteen years the numbers of times that the average price for a month was lower than the preceding month were as follows: November, 12; December, 12; January, 7; February, 2; March, 3; April, 1; May, 1; June, 4; July, 4; August, 4; September, 9; October, 8. In at least eleven of the fifteen years the price advanced each month from February to August. Substantial declines of over 5 cents a bushel from one month to the next occurred only three times between December and September during the entire fifteen-year period.

The price changes from 1920 to 1927 have been more irregular than in the earlier period. Eight years is too short a period on which to base definite conclusions, but the apparent changes are worth noting, as the pre-war figures are sometimes referred to as typical of the present situation.

During this later period a tendency toward certain definite changes is indicated for four months only, May, July, September and October. In August gains and losses were equally divided, but in September and October the averages were below the previous month in six of the eight years. Altho the average for November during the eight years declined during half of these years, it was slightly above that of the previous month. From December to April gains and losses were about equally divided. This contrasts with the earlier period, when typically the price began to rise in February.

May was the only month during each of these eight years when the average equalled or exceeded the previous month. In June gains and losses were equally divided, altho the increases were usually larger in amount than the decreases. The largest average increase took place in July, when there were six gains and only two losses, but the average was influenced considerably by the large increase in July, 1923. As stated above, gains and losses were evenly divided in August. It is during this month that readjustment to the new-crop basis apparently begins, and it continues down to December.

The only tendencies that are definite enough to be used as a guide to a general marketing policy for corn are the general summer advance, the seasonal declines that occur in late summer, and the tendency for prices in May and July to be higher than in the previous months.

### OATS SHIPMENTS

Shipments of oats, like shipments of corn, were reported to be rather uniformly distributed thru the year. The harvest peak of shipment preceded that of corn by several months, of course.

The information reported on oats shipments is summarized in Table 10 and Fig. 10 and shown in detail in Tables 27 and 30 of the Appendix.

TABLE 10.—PERCENTAGE OF ANNUAL CARLOADS OF OATS SHIPPED EACH MONTH BY ILLINOIS REPORTING ELEVATORS

Year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1923-24,.....	5.1	13.7	9.1	6.4	3.8	5.5	11.4	11.1	8.9	9.9	8.2	7.0
1924-25,.....	4.3	23.8	12.5	6.8	3.6	7.5	9.6	4.9	6.5	6.4	8.3	5.8
1925-26,.....	12.3	14.4	7.2	5.8	5.1	6.3	7.3	8.4	6.8	8.1	8.2	10.1
Average...	7.2	17.3	9.6	6.3	4.2	6.4	9.4	8.1	7.4	8.1	8.2	7.6

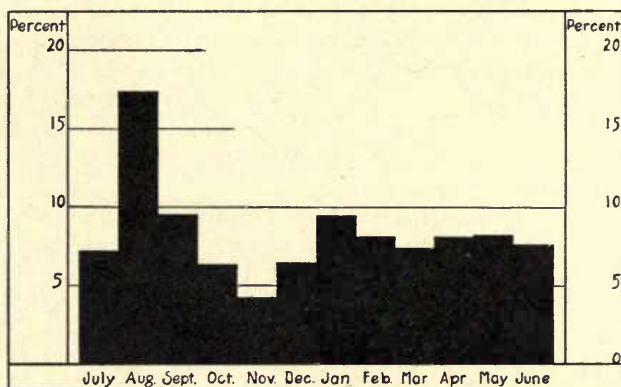


FIG. 10.—PROPORTION OF ILLINOIS OATS SHIPMENTS MADE IN THE DIFFERENT MONTHS OF THE YEAR

Shipments have been distributed rather uniformly thru the year, considering the state as a whole. There is a small peak in August and a noticeable decline in November, but on the whole a regular movement of oats is suggested by these figures. (Graph based on data for three years, July, 1923, to June, 1926.)

July, August, and September shipments of oats varied from year to year because of differences in dates of harvest. In 1924-25 a larger proportion was shipped at or shortly after harvest than during the other two years. From July to September, 1924, 40 percent of the year's oats shipments were made, as compared to 25 percent for the same month in 1923 and 33 percent in 1925.

On a quarter-year basis we have the following division of the year's shipments: July to September, 34 percent; October to December, 19 percent; January to March, 25 percent; April to June, 24 percent. About one-third of the shipments were made at harvest time or shortly afterwards, but following this season shipments fell off, so that the total for the six months from July to December was about one-half of the year's total. During each of the two other quarters about one-fourth of the year's shipments were made.

Illinois oats, it is apparent, were not dumped into the terminal markets at harvest time. This means that the storage service needed



in marketing them was rendered to a large extent by local interests, either by country elevators or by farmers.

### Sectional Differences in Season of Oats Shipments

Sectional differences in the season of marketing oats are shown in Fig. 11. The northeast and eastern districts of Illinois, both of which are important producers of oats for market, made relatively small shipments during the period from July to September, compared with the balance of the state. The extent to which oats are stored locally is probably influenced by the storage capacity of the elevators in these different areas, which is indicated by Fig. 14.

### Seasonal Changes in Oats Prices 1923 to 1926

The average prices of No. 3 white oats at Chicago for selected months during the period of this study are shown in Table 11.

The changes indicate that the storage of oats from August to January would have returned the holder a gross gain of 8 cents both in 1923 and 1924 and only 1 cent in 1925; and that storage from August to April would have returned the holder 10 cents in 1923-24, would have lost him 8 cents in 1924-25, and would have earned him 1 cent in 1925-26. It has been shown that oats were marketed least rapidly in 1923-24, the year during this period when storage paid best, and most rapidly in 1924-25, the year in which delayed marketing, particularly after January, was costly.

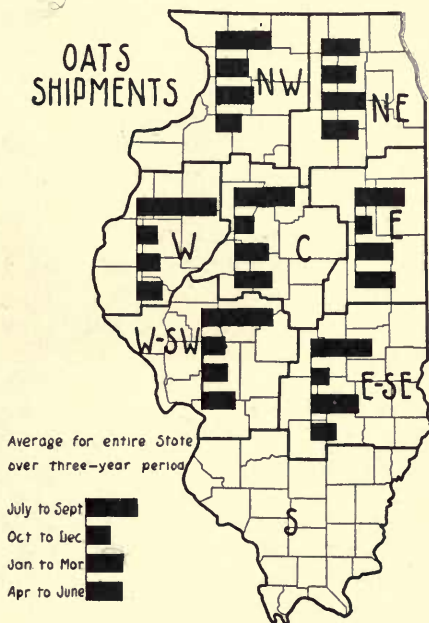


FIG. 11.—SEASONAL SHIPMENTS OF OATS FROM DIFFERENT DISTRICTS OF ILLINOIS

In the principal oats producing districts shipments are quite regularly distributed thru the year. During the October-December period shipments fall off. In western and southern Illinois, where only a few oats are marketed, shipments have tended to be concentrated immediately after harvest. (Graph based on three years, July, 1923, to June, 1926.)

TABLE 11.—AVERAGE MONTHLY PRICE OF NO. 3 OATS AT CHICAGO DURING  
SELECTED MONTHS  
(Cents per bushel)

Year	August	October	January	April	June
1923-24.....	38	43	46	48	51
1924-25.....	50	50	58	42	49
1925-26.....	41	39	42	42	40

These observations are based entirely on cash prices. If the oats had been hedged by the sale of futures, the results would have been entirely different. The process of hedging is discussed further on pages 22 to 24.

### Usual Seasonal Changes in Oats Prices

How typical were the price changes during the three years covered by this study?

The average seasonal increases in prices shown in Table 12 and Fig. 12 do not indicate any very large profit from storing oats. If

TABLE 12.—AVERAGE MONTHLY PRICE OF NO. 3 OATS AT  
CHICAGO DURING TWO PERIODS  
(Cents per bushel)

Period	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
1899-1913....	35	36	36	36	37	38	39	39	39	40	41	41
1921-1927....	40	41	42	43	46	46	46	46	46	48	48	45

in the fifteen years from 1899 to 1913 an elevator had stored 10,000 bushels of oats each year from August to December, it would have had a gross profit of about 2 cents a bushel, or \$200 with which to pay the holding costs; if it had stored this quantity of oats from August to February, it would have made a gross profit of about 4 cents a bushel, or \$400; and if it had stored them from August to June, a gross profit of about 6 cents, or \$600 would have been realized. Out of these increases the elevator would have had to pay for insurance, use of storage space, shrinkage, and interest on \$3,500 for four, six, and ten months respectively. It is obvious that the storing of oats during the average year was not very profitable during this pre-war period, in so far as changes in cash prices are the basis for judgment.

During the eight years from 1921-22 to 1927-28 the average increase in oats prices from August to December has been 6 cents a bushel. If oats stored in August had been sold during January, February, and March, the average gross earnings would have been about 1 cent a month, providing the storer depended merely on changes in cash prices. Storage space must be rather cheap to make this a profitable operation.

The seasonal variation in price of oats is quite regular from year to year (Fig. 13). During the earlier period, 1899 to 1913, prices

increased rather regularly or remained unchanged from one month to the next between August and the following May. Only during the month of October did the declines equal the increases. But typically these month-to-month changes were small. Between these two months

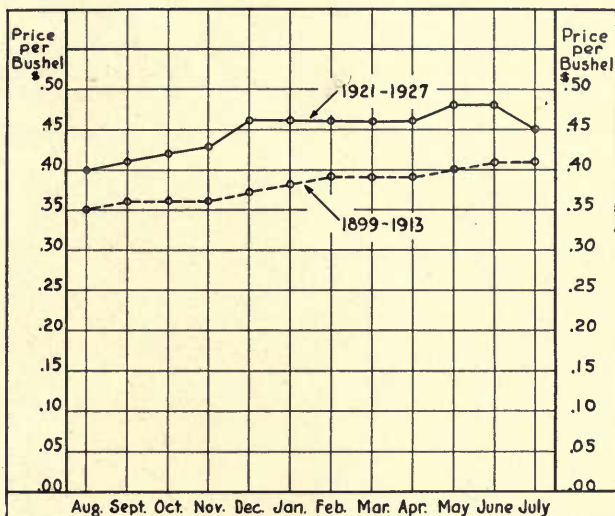


FIG. 12.—MONTHLY AVERAGE PRICE OF NO. 3 WHITE OATS AT CHICAGO DURING A PRE-WAR AND A POST-WAR PERIOD

Prior to the World War, oats prices advanced, on the average, rather steadily thru the year, altho the average increase from August to May was only 5 cents a bushel. For the period since 1921 there has been little rise after December.

the price declined from one month to the next more than 3 cents a bushel only four times during the fifteen-year period and increased by 5 cents or more a bushel only once. The month most regularly below the previous month was August; and this reflected the readjustment to the new-crop basis.

The period since 1921 has been rather brief to use as a basis for very definite conclusions. A study of Fig. 13, however, will show that the same general tendencies have operated thru this period as thru the earlier period, altho the same degree of regularity is not noticeable. In October, November, December, and April the price was generally higher than during the previous month, and in July and August it was generally lower. During the other months no definite tendency is to be noted. Changes from month to month were generally not large; from September to June they exceeded 5 cents a bushel only six months out of the eighty included in the period covered.



Changes in cents per bushel	Aug. over July	Sept. over Aug.	Oct. over Sept.	Nov. over Oct.	Dec. over Nov.	Jan. over Dec.	Feb. over Jan.	Mar. over Feb.	Apr. over Mar.	May over Apr.	June over May	July over June
Crops of 1899 - 1913												
Increases												
05-10												
03-05												
00-03												
None												
Decreases												
00-03									-			
03-05												
05-10												
10-15												
15-25												
Average	-.05	+.01	.00	.00	+.01	+.01	+.01	.00	.00	+.01	+.01	.00
Cumulative increases from August		+.01	+.01	+.01	+.02	+.03	+.04	+.04	+.04	+.05	+.06	+.06
Crops of 1921 - 1927												
Increases												
05-10												
03-05												
00-03												
None												
Decreases												
00-03												
03-05												
05-10												<sup>1</sup>
Average	\$.02	+.01	+.01	+.01	+.03	.00	.00	.00	.00	+.02	.00	-.03
Cumulative increases from August		+.01	+.02	+.03	+.06	+.06	+.06	+.06	+.06	+.08	+.08	+.05

<sup>1</sup>This includes one decline of 12 cents.

FIG. 13.—FREQUENCY WITH WHICH CERTAIN MONTH-TO-MONTH CHANGES OCCURRED IN THE PRICE OF NO. 3 WHITE OATS AT CHICAGO

Month-to-month changes in the price of this crop have been rather irregular. However, only in June and July were decreases from the preceding month more common than increases.

### Comparative Earning Opportunities on Hedged and Unhedged Oats 1921 to 1927

The above discussion is based entirely on changes in cash prices. Large quantities of oats are stored on an entirely different basis, future contracts being sold on the Chicago Board of Trade or other grain exchange against the cash grain as it is purchased. This use of future contracts in connection with transactions in cash grain is known as hedging.

Gross profits from storage arise from the differences between cash and future prices at the time of purchase and sale. The normal relationship is for the cash price to be below the future price until the delivery month arrives or shortly before. The margin narrows, however, as the delivery month approaches and usually, just before or during the delivery month, the cash price goes to a slight premium above the price of the future.

The margin earned on the storage of oats hedged by the sale of futures is the amount by which the cash price is below the price of the future at the time of purchase, plus the amount by which the cash price exceeds the future price at the time of sale, minus the costs of hedging. For example, if oats are bought in August for 40 cents a bushel at a time when the price of the December future is 46 cents, and are sold in November for 42 cents when the December future is 41 cents, the gross margin earned is 7 cents a bushel, or the sum of the difference between the future price and the cash price in August ( $46 - 40 = 6$ ) and the difference between cash and future in November ( $42 - 41 = 1$ ). Another way of expressing this is to compare cash and future prices separately at time of purchase and sale. Cash oats bought for 40 cents and sold for 42 cents would yield a profit of 2 cents; and a future contract sold at 46 could be cancelled by a purchase at 41 cents, yielding a profit of 5 cents. The total profit earned on the entire transaction would be 7 cents. This profit was earned in spite of the fact that oats prices failed to make their normal seasonal increase; the decline in the price of the future off-set the failure of the cash market to increase. If the market had advanced, the fact that the future contract had been sold at 46 cents could have prevented the holder of the oats from getting a profit much above 7 cents.

In actual practice the transaction might be more complicated than this because the holder of the oats might have first hedged them by selling September futures and then shifted to December and then possibly to May, his total margin being influenced by changes in the relationship between the price of these various futures.

The type of transaction just described is quite different from one that is sometimes used by country grain shippers, in which the farmer delivers his oats but does not sell them. The elevator ships the oats to market, sells at the current market price, and buys an equivalent quantity of futures. Later the farmer sells the oats to the elevator man, who then sells the future he has bought to protect himself against variations in prices. On this transaction the elevator operator loses the difference between future price and cash price instead of gaining it, and is bound to lose money unless storage charges are collected from the farmer. To illustrate, using the prices given above, the elevator man sold the oats for 40 cents and bought futures for 46 cents; on this transaction he stood a loss of 6 cents. Later he bought oats from the farmer for 42 cents and sold the future for 41 cents. On this he lost 1 cent, making a total loss of 7 cents. This would work out as a losing transaction whenever there was the normal relationship between cash and future prices even if the market had advanced. This type of transaction is an undesirable one and should be clearly distinguished from a hedge where futures are sold against grain which has been bought and is being stored.

Theoretical earnings or losses from holding unhedged oats from August to March and the carrying charges earned by holding hedged grain for the same period have been computed by comparing prices on certain days in August—the 5th, 10th, 15th, 20th, 25th, 30th, or the next business day—with prices on the corresponding dates during the next March, and averaging the earnings for the years 1921-22 to 1926-27 (Table 13). This leaves out of account any earnings or losses

TABLE 13.—SEASONAL CHANGES FROM AUGUST TO MARCH IN CASH PRICE OF No. 3 OATS AT CHICAGO, 1921-1927; DIFFERENCES BETWEEN MAY FUTURE PRICE IN AUGUST AND IN MARCH; AND COMPUTED AVERAGE OPPORTUNITY FOR GROSS EARNINGS ON HEDGED OATS STORED FROM AUGUST TO MARCH  
(Cents per bushel)

Year	Increase or decrease in cash prices between August and March	Amount by which price of May future exceeded cash price in August	Amount by which cash price was above May future in March	Computed margin of opportunity for gross earnings on hedged oats stored from August to March
1921-22.....	+ 3.7	+6.1	+1.4	+7.5
1922-23.....	+12.0	+3.2	+1.6	+4.8
1923-24.....	+ 8.2	+1.9	+1.3	+3.2
1924-25.....	- 2.8	+4.2	+2.5	+6.7
1925-26.....	- 1.3	+5.4	+ .5	+5.9
1926-27.....	+ 7.6	+6.6	+3.0	+9.6
Average.....	+ 4.6	+4.6	+1.7	+6.3

from first hedging by sale of December future and later changing to May, a procedure which would have been followed in practice in many cases. The apparent opportunity for earnings from holding hedged oats from 1921-22 to 1926-27 averaged 6.3 cents per bushel gross, while that for earning on unhedged oats was 4.6 cents. Out of these earnings it would have been necessary to pay the costs of hedging, including commission charges of  $\frac{1}{4}$  cent a bushel and interest on margins, which would have been less than  $\frac{1}{2}$  cent a bushel. There was apparently a greater advantage during this particular post-war period in hedging stored oats than in holding the grain without hedges. The differences were not large, however, on the average, and in two out of the six years the unhedged oats would have earned the larger returns.

## STORAGE CAPACITY OF ILLINOIS COUNTRY ELEVATORS

The average storage capacity of 344 country elevators reporting for 1925 was 38,750 bushels exclusive of corncrib capacity. This is somewhat larger than the average of 36,300 bushels reported as of May 15, 1918, for 2,031 elevators in Illinois licensed by the United States Grain Corporation,<sup>1</sup> and 32,060 bushels reported as of February, 1918, for 1,057 Illinois elevators filing schedules with the Federal Trade

<sup>1</sup>Wheat and rye statistics. U. S. Dept. Agr. Statis. Bul. 12, 50. 1924.



TABLE 14.—STORAGE CAPACITY OF ILLINOIS COUNTRY ELEVATORS AND OF CORNCRIBS OPERATED BY THEM IN 1925

Crop reporting district	Approximate number of elevators in district	Elevators reporting capacity of their—				Average reported capacity of—	
		Elevators		Corncrubs		Elevators	Corncrubs
		number	perct.	number	perct.	bu.	bu.
Northwest.....	228	42	18.4	13	5.7	24 952	3 340
Northeast.....	243	44	18.1	13	5.3	48 477	3 360
East.....	351	65	18.5	31	8.8	54 600	9 900
West.....	157	15	9.6	8	5.1	19 500	3 190
Central.....	354	89	25.1	42	11.9	38 657	9 270
West-southwest.....	285	59	20.7	25	8.8	24 890	11 300
East-southeast.....	190	20	10.5	16	8.4	58 150	50 440
South.....	192	10	5.2	7	3.6	23 900	2 540
State.....	2 000	344	17.2	155	7.8	38 750	12 360

Commission.<sup>1</sup> The fact that the average capacities reported for February and May, 1918, were 17.5 percent and 6.3 percent less than those reported for 1925 does not necessarily indicate that the average capacity of elevators is increasing. The figures for 1925 refer to only about one-sixth of the elevators in the state, while the reports of the Grain Corporation included all elevators and the report of the Federal Trade Commission included about one-half. The 1925 figures may not have included as many of the smaller elevators as did the earlier and more complete surveys. It is quite possible, however, that the trend toward reduction in the number of firms engaged in the country grain trade has increased the average amount of space available per elevator.

The average reported capacity of elevators and corncrubs varied considerably in different parts of the state. These average reported capacities, together with the proportions of the elevators in the different districts on which the averages are based, are

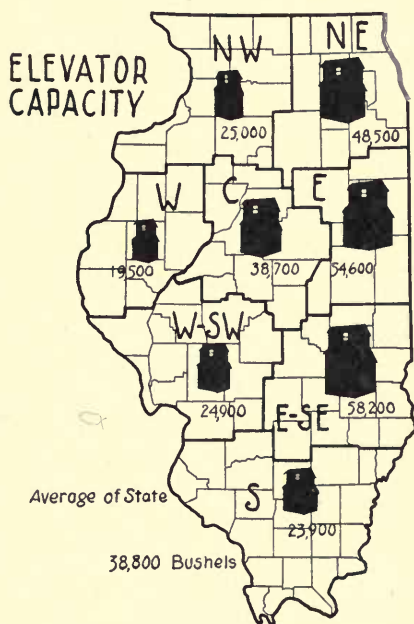


FIG. 14.—AVERAGE CAPACITY OF REPORTING ELEVATORS IN DIFFERENT DISTRICTS OF ILLINOIS

The elevators in the eastern half of the state show much larger capacities than those in other parts. The average capacity of all elevators reporting (344) was 38,800 bushels in 1925.

<sup>1</sup>Country grain marketing. Fed. Trade Comn. Report on Grain Trade 1, 34, 62, 67. Sept., 1920.

shown in Table 14 and Fig. 14. In general, elevators in the eastern part of the state reported the largest capacities. Elevators in the oats-shipping districts were larger than those in the wheat districts. This would be expected because oats are more commonly stored in Illinois at country points than is wheat.

A considerable amount of supplemental storage capacity for housing ear corn is reported. The extent of this corncrib storage is especially to be noted in the districts along the southern edge of the main corn marketing region, that is to say, in the west-southwestern and east-southeastern districts. Practically all the elevators in the latter district reported corncribs, and the amount of such crib capacity was nearly as large as the amount of storage space inside the elevator proper. In fact the reporting elevators in this district were of larger average capacity, both inside and outside, than those in any other area. They averaged twice as much total storage space as the elevators in any other district except the eastern.

### Comparative Figures for Farmers' and Private Elevators

For the state as a whole the average capacity of farmers' and privately owned elevators was practically identical (Table 15). In

TABLE 15.—STORAGE CAPACITY OF ILLINOIS COUNTRY ELEVATORS IN 1925:  
EXCLUSIVE OF CORNCRIB CAPACITY

(Expressed in bushels)

Crop reporting district	Approximate number of country elevators	Farmers' elevators reporting		Privately-owned elevators reporting		Total reporting elevators	
		Number	Average capacity	Number	Average capacity	Number	Average capacity
			bu.		bu.		bu.
Northwest.....	228	10	33 100	32	22 406	42	24 952
Northeast.....	243	23	53 217	21	43 285	44	48 477
East.....	351	33	60 515	32	48 500	65	54 600
West.....	157	10	18 800	5	20 900	15	19 500
Central.....	354	51	36 627	38	41 382	89	38 657
West-southwest.....	285	39	23 000	20	28 575	59	24 890
East-southeast.....	190	2	72 500	18	56 555	20	58 150
South.....	192	4	7 250	6	35 000	10	23 900
Total.....	2 000	172	38 800	172	38 700	344	38 750

the northern and eastern parts of the state, however, farmers' elevators reported larger average capacities. In the northern district an average capacity of 53,000 bushels was reported for the farmers' elevators and 43,000 bushels for the privately owned elevators, and in the eastern district 60,000 bushels for the farmers' elevators and 48,000 bushels for the privately owned elevators.

On the other hand, a larger proportion of privately owned elevators than of farmers' elevators reported corncribs. The average capacity reported for the private companies was 14,700 bushels compared with 9,400 for the farmers' elevators (Table 16). In the eastern and cen-



TABLE 16.—CORNCRIB CAPACITY OF ILLINOIS COUNTRY ELEVATORS IN 1925  
(Expressed in bushels)

Crop reporting district	Farmers' elevators reporting		Privately-owned elevators reporting		Total reporting elevators	
	Number	Average capacity	Number	Average capacity	Number	Average capacity
		<i>bu.</i>		<i>bu.</i>		<i>bu.</i>
Northwest.....	1	2 000	12	3 450	13	3 340
Northeast.....	7	2 940	6	3 850	13	3 360
East.....	12	12 580	19	8 210	31	9 900
West.....	6	2 500	2	2 250	8	3 190
Central.....	22	11 830	20	6 450	42	9 270
West-southwest.....	15	8 300	10	15 800	25	11 300
East-southeast.....	1	60 000	15	49 800	16	50 440
South.....	4	850	3	4 830	7	2 540
Total.....	68	9 450	87	14 638	155	12 360

tral districts the farmers' elevators reported larger corncrubs per elevator than the private companies.

### Season of Shipment and Storage Capacity

Seasonal differences in the season of shipping oats appear to have been influenced by differences in elevator capacity, altho this was not true for corn. The northeastern and eastern districts, both having large elevators, distributed their shipments of oats more uniformly than the other districts, which had smaller storage capacity. On the other hand, in the southern district, where wheat shipments were most uniformly distributed, elevator capacity was relatively small. This section of the state produces a small surplus of oats and has adequate farm storage facilities for small grain.

### FARM STORAGE

Information obtained from 471 farmers in all parts of the state indicate that the average farm is fairly well supplied with storage space for corn, but that in certain sections of the state storage for small grain is not available on farms. This refers to the average, of course, for individual farms in all sections are short of corn storage space.<sup>1</sup>

### Corn Storage

On the 471 farms for which the owners or operators reported, the average yearly production of corn from 1922 to 1926 was 2,848 bushels and the average capacity of permanent corncrubs was 2,978 bushels. Temporary cribs were reported with an average capacity of 659 bushels, of which 298 bushels were outside of buildings. For years

<sup>1</sup>The reports from 471 farmers on which this discussion is based were obtained thru A. J. Surratt, Agricultural Statistician, Illinois Cooperative Crop Reporting Service, and summarized by L. F. Rickey, Associate in Grain Marketing, Department of Agronomy, University of Illinois.

TABLE 17.—AVERAGE PRODUCTION OF CORN FROM 1922 TO 1926 AND AVERAGE CORN STORAGE CAPACITY  
PER FARM IN ILLINOIS FOR 1926

Crop reporting districts	Number of reports	Av. yearly harvested 1922-26	Average for 471 reporting farms <sup>1</sup>						Average for all farms in district			
			Corn storage capacity, 1926						Percent of crop sold	Average corn crop 1922-26 <sup>2</sup>	Permanent corn-cribs	Largest corn crop 1922-1926 (1925)
			Per- manent cribs	Temporary, used in years of largest yields		Total	Distribution of storage space available in years of largest yield, percentages in—					
				In buildings	Outside		Per- manent	Temporary				
Northwest.....	55	2 652	bu. 2 674	bu. 415	bu. 199	bu. 3 288	perct. 81	perct. 13	perct. 6	bu. 2 003	bu. 2 457	bu. 2 604
Northeast.....	76	3 064	3 351	406	132	3 889	86	11	3	1 710	2 260	2 052
West.....	51	3 120	2 881	427	564	3 872	74	11	15	1 832	1 972	2 199
West-southwest.....	72	2 787	2 506	532	515	3 553	71	15	14	1 483	1 648	1 891
Central.....	39	4 187	4 714	337	851	5 902	80	6	14	2 538	2 631	2 936
East.....	62	4 089	4 603	188	55	4 846	95	4	1	2 857	3 130	3 127
East-southeast.....	43	2 866	2 848	430	180	3 458	82	13	5	1 147	1 891	1 271
Southwest.....	35	874	1 025	158	23	1 206	85	13	2	550	713	642
Southeast.....	38	1 061	1 128	141	152	1 421	79	10	11	648	1 069	740
State.....	471	2 848	2 978	361	298	3 637	82	10	8	1 590	2 065	1 887

<sup>1</sup>Based on reports obtained thru courtesy of the U. S.-Illinois Crop Reporting Service, the U. S. Department of Agriculture and Illinois State Department of Agriculture cooperating.

<sup>2</sup>Production figures are computed from the official crop estimates for the area, divided by number of farms which are over 20 acres.

of large crops the storage used averaged 3,637 bushels, 82 percent being permanent cribs, 10 percent temporary inside cribs, and 8 percent temporary outside cribs. This temporary storage, particularly that outside of building, is, of course, very elastic. The permanent cribs alone are more than adequate to take care of an average crop. Nevertheless, 124 of the 471 farms reported permanent cribs with a capacity less than their average crop.

The relationship between storage and average crop did not vary widely in different parts of the state (Table 17 and Fig. 15). Per-

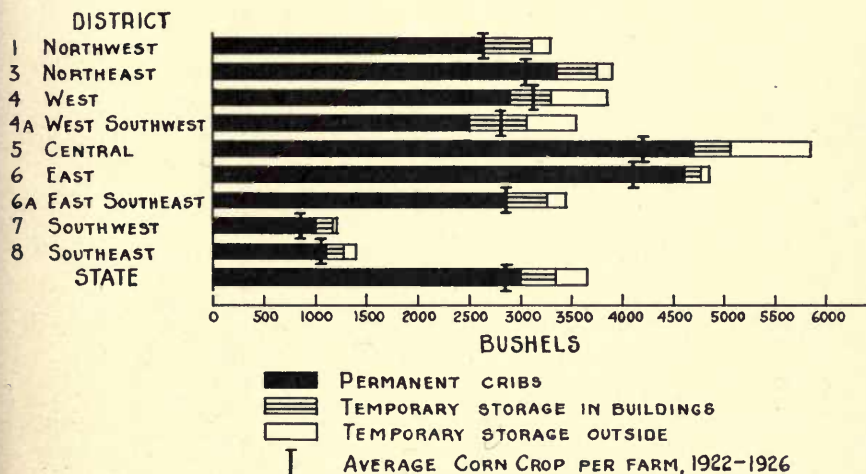


FIG. 15.—AVERAGE CORN STORAGE CAPACITY REPORTED ON 471 ILLINOIS FARMS IN 1926, AND AVERAGE CORN CROPS FROM 1922 TO 1926, BY CROP REPORTING DISTRICTS

Except in the western and west-southwestern districts, where the bulk of the corn grown is fed to livestock, the permanent corncribs on reporting farms would store the average corn crop. The margin is not large, however, in any of the eight districts, and in all of them temporary storage is required in years of large crops. The largest margin between the average crop and permanent crib capacity was in the two principal corn-marketing districts—the central and the eastern.

manent cribs exceeded the average crop by the largest amounts in the eastern and central districts of the state and were less than the average crop in the west and west-southwest sections.<sup>1</sup> In all districts the total exceeds the average crop when temporary storage is included.

These farmers also estimated the average crib capacity on all farms in their townships. The reporting farmers operated or owned farms larger than the average, and consequently the average storage

<sup>1</sup>For area included, see Fig. 2.

TABLE 18.—AVERAGE PRODUCTION OF SMALL GRAIN FROM 1922 TO 1926 AND ESTIMATED AVERAGE STORAGE CAPACITY PER FARM IN ILLINOIS FOR 1926

Crop reporting districts	Average for 471 reporting farms <sup>1</sup>				Average for all farms in district					Largest crop of small grain per farm	
	Number of reports	Average small grain harvested 1922-26	Estimated permanent grain storage in tight bins 1926	Percentage of crop sold		Production per farm <sup>2</sup>			Estimated permanent grain storage in tight bins		year
				Oats	Other small grains	Oats	Wheat	Barley and rye			
Northwest.....	55	1 943	2 315	24	21	bu.	bu.	bu.	1 839	1925	bu.
Northeast.....	76	2 689	3 318	37	48	1 041	120	148	1 309	1925	1 630
West.....	51	1 693	1 938	14	69	1 107	171	231	1 599	1925	1 770
West-southwest.....	72	1 693	1 197	21	86	524	314	26	864	1925	963
Central.....	39	2 867	2 118	57	76	334	408	11	753	1923	975
East.....	62	2 853	2 118	70	89	995	394	20	1 413	1924	1 808
East-southeast.....	43	1 672	1 292	27	62	1 617	162	22	1 801	1924	2 383
Southwest.....	35	1 719	1 117	12	77	310	124	6	440	1923	540
Southeast.....	38	537	1 700	5	59	137	321	5	463	1925	600
State.....	471	1 990	2 088	29	66	139	93	...	232	1923	278
						671	225	53	949	1924	1 043

<sup>1</sup>Based on reports obtained thru the courtesy of the U. S.-Illinois Crop Reporting Service, the U. S. Department of Agriculture and Illinois State Department of Agriculture cooperating.

<sup>2</sup>Production figures based on official crop estimates for district divided by number of farms over 20 acres.

capacity was larger than on the average farm. The average of all the estimates was 2,065 bushels of permanent corncribs. If temporary storage was available on these farms in the same ratio as on the reporting farms, this would amount to about 450 bushels additional, making a total capacity of 2,500 bushels per farm. From 1922 to 1926 the average farm over 20 acres in size in Illinois produced about 1,600 bushels of corn and in 1925, the year of the largest crop, about 1,900 bushels. The estimates of crib capacity exceed this figure and indicate that, on the average, farm storage capacity for corn is more than adequate.

### Small-Grain Storage

The average small-grain crop, as reported by the 471 farmers, was 1,990 bushels, while the average tight-bin storage capacity for small grain was 2,068 bushels. This indicates that in years of large

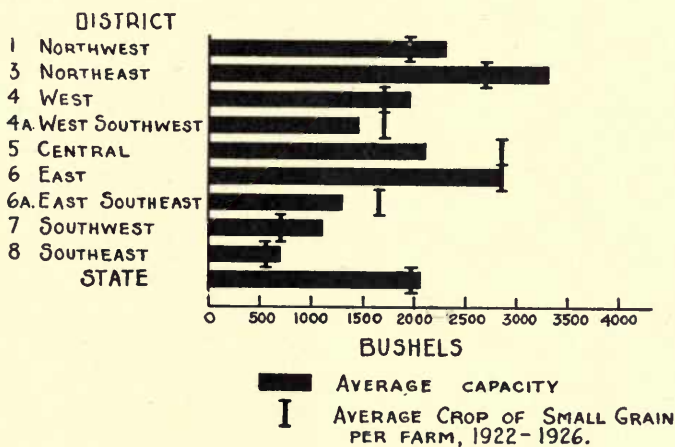


FIG. 16.—AVERAGE CAPACITY OF TIGHT-BIN STORAGE FOR SMALL GRAINS REPORTED ON 471 ILLINOIS FARMS IN 1927, BY CROP REPORTING DISTRICTS

The average crop of small grains from 1922 to 1926 exceeded the storage space in tight bins in four of the Illinois crop reporting districts—the west-southwestern, the central, the eastern, and the east-southeastern. This, of course, makes the marketing of a part of the small grain at threshing time necessary. In the northeastern district, where small grain production averages largest per farm, there is a good margin of storage space in the average year.

crop it would not be possible for farmers to store the entire crop. On 123 of these 471 farms the reported average storage space was less than the average production reported. Details by districts are shown in Table 18 and Fig. 16.

In the northern, western, and southern districts tight-bin storage appears adequate for farm storage, but in the central, west-south-



western, eastern, and east-southeastern districts this class of storage space appears inadequate for even an average crop of small grains. In these sections sale at harvest time is rather common.

The estimates for all farms indicate a larger capacity relative to production than that given for reporting farms. The average of these estimates for the state was 1,287 bushels of tight bins, while the average production of small grains from 1922 to 1926 was about 875 bushels per farm.

The average storage capacity per farm exceeded both the average crop and the largest crop during the period 1922 to 1926 in all except the west-southwest, central, and eastern districts, the deficiency in storage space being most marked in the central and eastern districts. Unquestionably there are many farms in these districts not supplied with adequate storage space for their small-grain crops.

Facts given in reply to the question regarding storage indicate that the average reporting farmer, with a comparatively easy opportunity to store ear corn in improvised cribs, had a fairly adequate amount of corn storage space, and that lack of storage on the farm, therefore, did not compel country elevators to store large quantities nor to ship it quickly. Small-grain storage, however, is indicated to be in a somewhat different position. Farm storage for these crops was not so generally available, and this has been a factor tending to hasten marketing by the farmers, making it necessary for country elevators or terminal marketing agencies to store these grains.

### How Often Farm Storage Was Filled

To the question, How many years out of the last five was the permanent storage space for corn and small grain filled? one-fifth replied that permanent storage for both corn and small grain was filled during each of the five years (Table 19).

Permanent corn storage was filled, on the average, about two years out of five, and the small-grain storage about one year in three. The corn storage was more completely utilized in the western districts, where the cribs averaged full utilization about half of the years. The eastern and central districts ranked next. Small-grain storage was most completely utilized in the central district where, on the average, available space was completely utilized nearly half of the years.

### Influence of Storage Capacity and Credit on Time of Sale

The number of years that time of sale was influenced by lack of storage space or lack of credit is shown for different parts of the state in Table 20.

In answer to the question, How often in the last five years would you have held grain until later in the season if more adequate stor-

TABLE 19.—DISTRIBUTION OF REPLIES OF ILLINOIS FARMERS TO THE QUESTION AS TO THE NUMBER OF YEARS OUT OF FIVE (1922 to 1926) PERMANENT GRAIN STORAGE WAS FILLED

Crop reporting district	Number of reports	Number of years permanent <i>corn</i> storage was filled						Proportion of years that permanent <i>corn</i> storage was filled
		0	1	2	3	4	5	
Northwest.....	50	18	10	7	3	4	8	<i>perct.</i> 35.6
Northeast.....	71	21	19	14	3	6	8	33.8
West.....	49	10	9	9	3	4	14	49.8
West-southwest.....	65	8	23	12	6	5	11	43.1
Central.....	35	6	10	5	5	0	9	45.7
East.....	60	15	16	6	2	1	20	46.0
East-southeast.....	42	7	15	8	3	2	7	39.5
Southwest.....	34	9	10	9	2	3	1	30.0
Southeast.....	35	11	9	1	7	2	5	37.1
State.....	441	105	121	71	34	27	83	40.3
Percentage of total.....	100	23.8	27.4	16.1	7.7	6.1	18.8	....
Crop reporting district	Number of reports	Number of years permanent <i>small-grain</i> storage was filled						Proportion of years that permanent <i>small-grain</i> was filled
		0	1	2	3	4	5	
Northwest.....	50	21	12	5	4	2	6	<i>perct.</i> 28.8
Northeast.....	72	23	19	5	7	7	11	36.9
West.....	47	21	6	8	0	1	11	34.5
West-southwest.....	59	21	16	2	4	0	16	38.0
Central.....	34	11	6	1	3	1	12	47.6
East.....	55	24	9	2	2	3	15	38.5
East-southeast.....	39	14	10	3	4	0	8	34.9
Southwest.....	32	15	11	2	3	0	1	18.1
Southeast.....	29	16	5	1	2	2	3	24.8
State.....	417	166	94	29	29	16	83	34.4
Percentage of total.....	100	39.8	22.5	7.0	7.0	3.8	19.9	....

age facilities had been available on the farm? nearly 75 percent of those responding stated that lack of storage space was not a factor, and only 9 percent stated that it was a factor three or more years out of five. In the eastern district, however, this factor determined the time of sale in about one-fifth of the years and in six other districts over one-tenth of the time.

In answer to the question, How often in the last five years would you have held grain until later in the season if bank credit had been more readily available? nearly three-fourths of the 230 who reported stated that lack of credit was not a factor but about one-sixth indicated that such a condition influenced time of sale at least three years out of five. This is a slightly larger proportion than reported that they had been affected by deficient storage facilities. In the central district the replies indicated that lack of credit influenced time of sale, on the average, about 31 percent of the time, and in the eastern district about 28 percent of the time. These are rather large proportions.

As these reports came from farmers believed to be above the average, it is probable that they underestimated the significance of

both lack of storage space and bank credit, in so far as these factors related to the general body of farmers.

TABLE 20.—DISTRIBUTION OF REPLIES OF ILLINOIS FARMERS TO QUESTIONS AS TO STORAGE AND BANK CREDIT BEING FACTORS INFLUENCING TIME OF SALE OF GRAIN DURING FIVE YEARS, 1922 TO 1926

Crop reporting district	Number of reports	Number of years in which grain would have been held had storage been available on farm						Proportion of years lack of storage was a factor
		0	1	2	3	4	5	
Northwest.....	26	20	4	1	0	1	0	perct. 7.7
Northeast.....	35	25	5	3	0	0	2	12.0
West.....	36	26	2	4	2	1	1	13.9
West-southwest.....	47	31	6	6	1	0	3	15.3
Central.....	26	20	0	4	1	0	1	12.3
East.....	39	28	1	2	2	1	5	20.5
East-southeast.....	27	20	3	1	1	0	2	13.3
Southwest.....	22	18	2	2	0	0	0	5.4
Southeast.....	21	14	2	3	1	1	0	14.3
State.....	279	202	25	26	8	4	14	13.4
Percentage of total.....	100	72.4	9.0	9.3	2.9	1.4	5.0	....
Crop reporting district	Number of reports	Number of years grain would have been held had bank credit been more readily available						Proportion of years lack of bank credit was a factor
		0	1	2	3	4	5	
Northwest.....	25	19	3	0	0	1	2	perct. 13.6
Northeast.....	32	24	1	1	4	0	2	15.6
West.....	27	20	1	3	0	0	3	16.3
West-southwest.....	37	28	0	3	1	1	4	17.8
Central.....	22	14	0	0	3	0	5	30.9
East.....	34	21	0	4	2	2	5	27.6
East-southeast.....	23	19	1	1	0	0	2	11.3
Southwest.....	16	13	1	0	1	1	0	10.0
Southeast.....	14	11	0	1	1	1	0	12.8
State.....	230	169	7	13	12	6	23	18.1
Percentage of total.....	100	73.4	3.0	5.6	5.2	2.6	10.0	....

### SEASON OF PURCHASE COMPARED WITH SEASON OF SHIPMENT

Information as to the exact date of purchase and sale of grain by elevators included in this study is not available. The division of Crops and Livestock Estimates, U. S. Department of Agriculture, has compiled information regarding the distribution, by months, of the sales of grain by farmers, based on reports from country elevators. For the period July, 1914, to June, 1923, these data have been published<sup>1</sup> and for the three-year period July, 1923, to June, 1926, the data for Illinois were made available thru the courtesy of the Division. The two series are graphically compared in Figs. 17 to 19.

**Wheat.** A comparison of the purchase and shipment figures indicates that elevators shipped wheat about as rapidly as they purchased it (Table 21 and Fig. 17). The seasonal peak which was evident in shipments may also be noted in purchases.

<sup>1</sup>Supplement to *Crops and Markets*, April, 1925.



TABLE 21.—CUMULATIVE PERCENTAGE OF YEAR'S PURCHASES AND SHIPMENTS OF WHEAT MADE TO END OF EACH MONTH BY ILLINOIS REPORTING ELEVATORS

To end of.....	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
Purchases, 1914-23.....	28.3	52.5	62.8	70.6	76.2	80.1	84.4	88.8	92.3	95.4	98.1	100
Purchases, 1923-26.....	25.7	57.9	69.5	75.6	79.5	83.6	87.9	90.9	93.4	95.8	98.2	100
Shipments, 1923-26.....	25.6	61.9	71.5	77.3	81.4	84.8	88.3	90.7	92.7	94.5	97.5	100

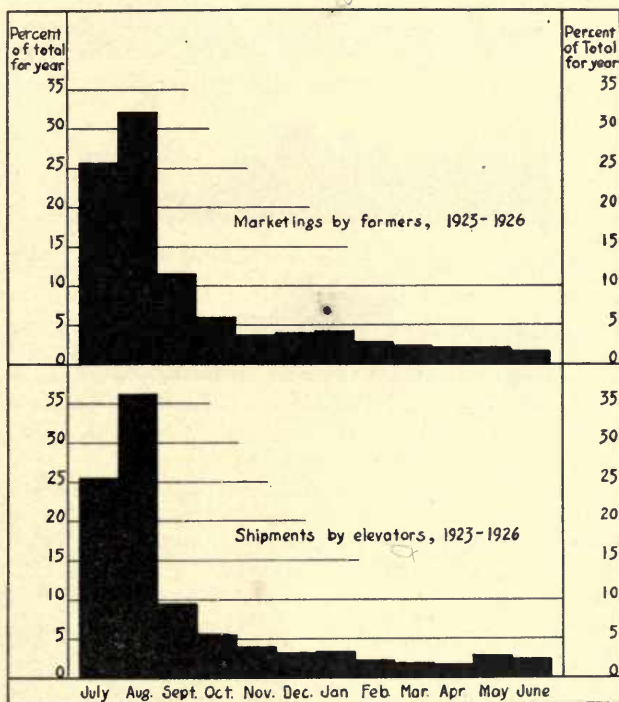


FIG. 17.—COMPARATIVE SEASONS OF PURCHASE AND SHIPMENT OF WHEAT BY ILLINOIS COUNTRY ELEVATORS

Purchases and shipments of this grain have a similar seasonal variation, indicating that elevators tend to ship wheat about as rapidly as they purchase it.

**Corn.** The figures for corn suggest that this grain was shipped about as rapidly as purchased (Table 22 and Fig. 18). A close agreement is to be noted between the distribution of purchases and shipments. The comparative uniformity of the flow of corn to market is apparently largely the results of farm storage or ownership by farmers of grain stored in local elevators rather than storage by elevators.

TABLE 22.—CUMULATIVE PERCENTAGE OF YEAR'S PURCHASES AND SHIPMENTS OF CORN MADE TO END OF EACH MONTH BY ILLINOIS REPORTING ELEVATORS

To end of.....	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
Purchases, 1914-23.....	6.9	13.1	21.1	27.7	38.0	49.5	62.5	72.5	78.5	84.5	91.6	100
Purchases, 1923-26.....	8.1	15.8	24.5	32.1	41.6	53.0	65.8	74.7	79.8	83.6	90.8	100
Shipments, 1923-26.....	7.0	13.9	22.1	29.7	40.8	52.1	65.8	74.2	79.7	83.9	90.8	100

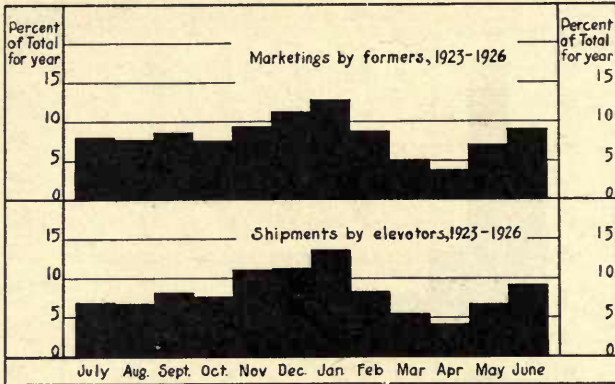


FIG. 18.—COMPARATIVE SEASON OF PURCHASE AND SHIPMENT OF CORN BY ILLINOIS COUNTRY ELEVATORS

Similar seasonal variations in purchases and shipments indicate that corn is shipped about as rapidly as it is purchased by elevators. The regularity of shipments from country points is caused by farm rather than by elevator storage.

**Oats.** Extensive storage of oats at country points is suggested by the figures for oats (Table 23 and Fig. 19). The even flow of oats away from country points results from storage by elevators rather than by farmers. There was a persistent tendency for shipments of oats to be more uniformly distributed thru the year than purchases. Up to and including September, 43 percent of the year's purchases had been made and only 34 percent of the year's shipments. Not until the end of April were purchases and shipments balanced.

TABLE 23.—CUMULATIVE PERCENTAGE OF YEAR'S PURCHASES AND SHIPMENTS OF OATS MADE TO END OF EACH MONTH BY ILLINOIS REPORTING ELEVATORS

To end of.....	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
Purchases, 1914-23.....	10.2	33.6	43.9	49.7	54.3	60.3	68.5	75.9	81.2	86.9	93.8	100
Purchases, 1923-26.....	8.1	29.0	42.7	49.5	53.4	60.1	69.2	76.0	80.5	85.5	93.2	100
Shipments, 1923-26.....	7.2	24.5	34.1	40.4	44.0	51.0	60.4	68.5	75.9	84.0	92.2	100

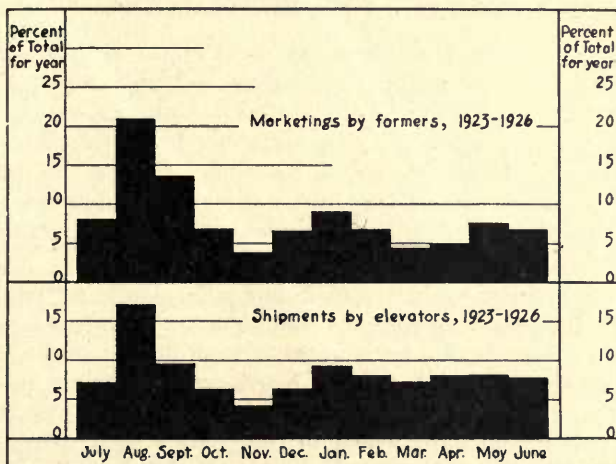


FIG. 19.—COMPARATIVE SEASON OF PURCHASE AND SHIPMENT OF OATS BY ILLINOIS COUNTRY ELEVATORS

Purchases of oats are much more seasonal than are shipments. This indicates that Illinois country elevators store a large amount of this grain.

### Seasonal Activity of Farmers' and Private Elevators Compared

The study of seasonal grain marketing naturally led to the question, Did the farmers' elevators and their patrons market their grain at harvest time to a greater or less extent than the privately owned elevators and their patrons?

A comparison of the shipments of 40 privately owned elevators and 73 farmers' elevators in the central and eastern districts for the period 1923 to 1925 (Tables 24 and 25) indicates that private elevators made a larger proportion of their shipments at or near harvest time than did the farmers' elevators, and this is true for all three grains.

TABLE 24.—PERCENTAGE OF ANNUAL GRAIN SHIPMENTS MADE DURING SELECTED MONTHS BY ILLINOIS REPORTING ELEVATORS

Year	Corn November-February		Oats July-September		Wheat July-September	
	Farmers'	Private	Farmers'	Private	Farmers'	Private
1923-24.....	36.8	44.3	22.6	30.8	83.4	88.4
1924-25.....	46.1	50.4	44.1	47.3	77.1	81.1
Average.....	41.4	47.4	35.4	39.0	80.2	84.8



## SUMMARY AND CONCLUSIONS

*Comparative Season of Shipment for Various Grains.*—The time of shipping wheat from Illinois elevators is highly seasonal. From 1923-24 to 1925-26, 70 percent of the year's shipments, on the average, were made prior to October 1. On the other hand, shipments of corn and particularly of oats are not so seasonal. During the three years studied only 44 percent of the corn was shipped from November to February inclusive, and only 34 percent of the oats from July to September inclusive.

*Sectional Differences in Grain Shipments.*—Different parts of the state show differences in season of shipment. Elevators in southern Illinois ship their wheat more uniformly than do elevators in the central and eastern parts of the state. Northern and western sections are intermediate in this respect. The production of soft wheat in the southern section and hard wheat in the central and eastern sections probably explain this difference in season of shipping, the soft wheat being held because of expectation of the greater seasonal rise which typically takes place in the price of this product.

Shipments of corn from the southern half of the state tend to be concentrated at harvest time more than in the balance of the state.

Shipments of oats from the northern and eastern sections of the state are more uniformly distributed thruout the year than from the southern and western sections. For the period studied, uniformity was particularly noticeable in the northeastern district, where oats are a very important crop. These variations apparently are related to differences in available storage capacity, elevators in the northern and eastern sections having larger capacity than those in other parts.

*Seasonal Changes in Grain Shipments.*—Some shifts occurred in the season of shipment between the different years. During each year of the period covered, wheat was marketed later than during the previous year. A larger portion of the corn and oats shipments were made at harvest time in 1924-25 than in either of the other two years. Relatively favorable prices at harvest time apparently stimulated earlier marketing of the 1924 crops.

*Seasonal Changes in Grain Prices.*—Typically, wheat prices have advanced from August to February and then declined. Seasonal increases in the prices of soft wheat have averaged larger than for hard wheat when either pre-war or post-war averages are considered.

Attempts to analyze the seasonal variation in corn prices are complicated by changes in grade. Before the war a rather regular seasonal increase took place in the price of No. 3 yellow corn at Chicago. From 1899 to 1913 the August price averaged 14 cents higher than in the previous December. The seasonal variation for the period 1920-1927 has been less marked. Altho there was an average increase of 12 cents



between December and August, there have been wide variations between the individual years which make up this average.

Seasonal variations in the price of oats have been typically small, and before the war were rather uniform from one year to the next. The average changes in price within the year indicate that storage space must be available at low cost in order to make the storage of oats profitable. From 1921 to 1927 the average increase in price of oats from August to March was only 6 cents a bushel. In spite of this, as has been noted, shipments of oats are distributed more uniformly thruout the year than are those of the other two grains.

Comparison of changes in the price of oats and the opportunities for earnings on oats hedged at time of purchase by sale of futures indicates that from 1921 to 1926 the opportunities for earnings from storing oats between August and March, were larger when the oats were hedged. This was not true, on the average, from 1914 to 1920.

*Effect of Storage Facilities and of Credit on Time of Shipment.*—The average storage capacity of 344 reporting companies was 38,750 bushels. The elevators average largest in the northeastern and eastern parts of the state, the average in these sections being about 50,000 bushels while in the central district the average was about 40,000 and in the balance of the state from 20,000 to 25,000 bushels.

Comparison of data on season of sale by farmers, compiled by the U. S. Department of Agriculture for the period 1914 to 1923, with shipment data for 1923-1926, indicates that Illinois elevators ship out corn and wheat about as rapidly as they purchase it, but that they ship oats less rapidly. The rather regular movement of corn from country elevators results from farm storage while that of oats can be attributed, to a large extent, to storage by elevators.

Information obtained from 471 farmers in all parts of the state indicates that the average farm is fairly well supplied with storage space for corn but that in certain sections farm storage is not available for all of the small grains raised. The 471 farmers reported that their permanent corncribs averaged 2,848 bushels and their tight-bin storage for small grain, 2,068 bushels. Only about one-fourth of these farmers reported that lack of storage facilities was a factor in determining time of sale during any of the last five years, and about the same proportion reported that lack of available credit influenced the time of sale any year during the same period. In the central and eastern districts, however, the farmers indicated that available bank credit affected time of sales during a little more than one-fourth of the years.

*Variations in Shipments from Two Different Types of Elevators.*—There were no significant differences between the season of shipping grain from private elevators and that of shipping from farmers' elevators, altho there was a tendency for the farmers' elevators to ship a slightly smaller percentage of their grain immediately after harvest.



APPENDIX

TABLE 25.—PERCENTAGE OF ANNUAL CARLOADS OF WHEAT SHIPPED EACH MONTH BY ILLINOIS COUNTRY ELEVATORS

Crop reporting districts <sup>1</sup>	Number of elevators reporting	Total	1923-24											
			July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
Northwest.....	32	260	15.8	32.7	6.2	8.5	2.7	3.8	8.1	5.4	3.1	4.2	3.8	5.7
Northeast.....	29	698	2.5	45.5	14.3	8.8	3.4	2.7	4.1	4.1	4.1	2.8	3.4	4.4
West.....	12	599	23.5	29.9	8.0	6.7	2.0	4.8	5.7	5.5	2.5	2.8	4.7	3.8
Central.....	67	2 721	25.6	48.4	11.2	3.7	1.9	1.3	1.0	1.5	1.0	2.7	1.5	2.2
East.....	54	1 010	22.0	51.7	10.4	4.1	1.4	1.2	2.2	2.0	1.3	1.0	1.8	2.0
West-southwest.....	61	2 648	36.6	31.5	9.4	5.4	3.8	1.6	2.9	1.5	2.3	1.9	1.1	1.9
East-southwest.....	10	437	29.3	37.8	7.3	9.2	1.1	1.8	1.1	3.7	2.3	1.8	2.5	2.3
East-southeast.....	8	273	25.6	15.4	7.0	7.0	5.9	5.5	6.6	5.5	6.6	5.1	5.1	4.8
State.....	282	8 586	26.6	40.0	10.1	5.4	2.7	2.0	2.7	2.4	2.1	1.7	1.9	2.5
1924-25														
Northwest.....	32	288	6.6	47.6	13.5	10.1	4.2	3.1	4.2	4.2	2.4	1.7	1.7	7
Northeast.....	29	396	4.3	41.7	23.5	6.1	4.0	3.3	4.5	2.3	2.0	1.0	3.5	3.8
West.....	12	478	7.3	47.1	14.6	7.1	3.8	4.6	3.6	3.3	2.1	2.1	2.7	1.7
Central.....	67	1 527	9.5	57.8	11.6	6.9	3.5	1.8	2.9	1.2	1.7	.5	2.7	2.2
East.....	54	493	17.0	49.7	9.3	8.9	3.0	3.4	4.5	1.8	.8	.6	1.6	.2
West-southwest.....	61	1 010	20.2	42.6	8.1	10.9	5.3	2.9	3.0	1.8	1.0	1.2	1.2	1.9
East-southwest.....	10	256	15.6	51.2	8.6	7.0	6.0	2.3	5.1	1.8	1.8	1.8	1.6	1.2
East-southeast.....	8	159	32.7	20.8	7.5	5.0	6.9	5.7	3.1	2.5	3.8	2.5	4.4	5.0
State.....	282	4 607	12.9	48.8	11.8	8.1	4.2	2.9	3.5	1.8	1.3	1.0	2.3	1.5

<sup>1</sup>For location and counties included see Fig. 2, page 5. The two southern districts are shown as one in the present study.



TABLE 26.—PERCENTAGE OF ANNUAL CARLOADS OF CORN SHIPPED EACH MONTH BY ILLINOIS COUNTRY ELEVATORS

Crop reporting districts	Number of elevators reporting	Total cars	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1923-24														
Northwest.....	32	754	11.9	16.4	10.7	9.0	5.7	5.8	13.1	10.5	2.8	3.3	4.6	6.0
Northeast.....	29	2 281	13.4	10.9	14.0	7.9	2.6	3.1	10.8	14.5	5.0	2.9	4.9	10.1
West.....	12	177	7.9	7.3	11.3	17.0	10.7	7.9	9.0	8.5	5.7	4.0	7.9	2.8
Central.....	67	4 151	5.5	5.3	7.2	5.3	10.8	4.4	12.9	11.7	6.0	8.3	10.1	12.6
East.....	54	4 305	10.8	5.3	8.1	6.0	18.8	3.8	13.2	13.3	6.8	5.0	7.9	11.0
West-southwest.....	60	1 483	2.6	3.3	4.4	4.3	19.6	12.5	16.6	7.3	5.1	10.1	6.2	7.9
East-southeast.....	19	1 031	3.9	3.1	3.3	5.3	30.2	7.8	13.4	6.8	2.4	5.5	8.7	9.6
South.....	8	174	4.0	5.7	3.4	12.1	25.3	23.6	12.6	5.7	2.9	1.1	1.1	2.3
State.....	281	14 356	8.3	6.4	8.2	6.2	11.1	5.4	13.0	11.6	5.5	6.0	7.7	10.4
1924-25														
Northwest.....	32	769	8.3	6.1	9.2	9.8	5.7	15.0	16.9	4.8	6.6	1.8	7.0	8.7
Northeast.....	29	2 660	8.4	10.4	10.0	13.9	5.7	7.6	15.3	7.2	5.7	1.4	7.4	7.0
West.....	12	233	6.9	4.4	9.4	15.9	7.7	16.7	8.6	9.4	6.9	6.4	5.2	6.4
Central.....	67	5 118	8.2	4.6	8.7	7.0	10.4	13.6	19.5	5.5	5.3	3.8	7.8	5.6
East.....	54	5 003	9.0	4.6	10.1	10.7	10.4	13.6	16.8	6.0	5.1	3.2	5.8	5.8
West-southwest.....	60	2 357	6.9	3.2	5.4	3.0	15.3	23.8	16.1	6.5	5.7	3.4	5.6	5.0
East-southeast.....	19	1 138	11.6	2.6	5.0	5.5	12.4	21.1	14.4	6.2	7.1	5.1	4.4	4.5
South.....	8	293	2.0	2.7	.7	7.5	24.2	22.2	13.7	7.8	6.1	4.1	6.5	2.4
State.....	281	17 571	8.4	5.1	8.5	8.7	10.2	14.8	17.0	6.1	5.6	3.2	6.6	5.8

TABLE 27.—PERCENTAGE OF ANNUAL CARLOADS OF OATS SHIPPED EACH MONTH BY ILLINOIS COUNTRY ELEVATORS

Crop reporting districts	Number of elevators reporting	Total cars	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1923-24														
Northwest.....	31	652	8.1	15.2	7.8	7.5	6.6	5.5	11.8	11.0	8.3	5.1	7.7	5.4
Northeast.....	29	1 858	4.4	8.3	11.0	9.7	4.1	6.6	12.1	11.2	7.9	10.4	7.5	6.7
West.....	12	158	11.4	31.0	12.7	5.1	3.2	7.0	3.8	7.6	2.5	1.3	5.7	8.9
Central.....	67	1 264	7.0	15.3	8.4	4.0	4.0	5.0	9.9	8.7	8.8	11.1	9.9	8.1
East.....	54	2 044	3.4	15.4	7.8	4.3	3.4	5.1	12.2	11.5	11.1	9.4	8.7	7.7
West-southwest.....	61	184	3.8	16.8	13.6	6.5	1.1	8.2	3.8	7.1	8.2	14.7	7.6	8.7
East-southeast.....	19	330	3.3	14.8	6.6	8.2	1.5	2.4	14.5	21.2	5.4	15.5	4.2	2.1
South.....	8	0	....	....	....	....	....	....	....	....	....	....	....	....
State.....	281	6 490	5.1	13.7	9.1	6.4	3.8	5.5	11.4	11.1	8.9	9.9	8.2	7.0
1924-25														
Northwest.....	31	711	5.6	8.2	20.0	10.0	6.2	7.5	11.5	4.9	6.6	5.1	7.9	6.6
Northeast.....	29	1 648	4.5	6.1	12.7	9.3	4.2	12.1	14.3	6.9	6.4	5.9	10.0	7.6
West.....	12	182	4.9	34.6	17.6	3.3	2.2	8.8	8.2	4.4	1.6	5.5	2.7	6.0
Central.....	67	1 533	3.6	32.7	14.4	4.8	2.3	5.0	7.3	3.0	7.3	8.8	6.2	4.5
East.....	54	2 060	4.8	27.0	9.4	5.7	3.4	7.8	8.8	3.4	6.3	5.4	10.3	5.7
West-southwest.....	61	452	2.9	53.1	8.6	6.2	5.3	....	1.6	4.0	3.5	6.4	5.5	2.9
East-southeast.....	19	287	2.4	39.4	8.4	4.9	.7	2.8	10.1	2.8	11.8	7.0	4.5	5.2
South.....	8	0	....	....	....	....	....	....	....	....	....	....	....	....
State.....	281	6 873	4.3	23.8	12.5	6.8	3.6	7.5	9.6	4.9	6.5	6.4	8.3	5.8

TABLE 28.—PERCENTAGE OF ANNUAL CARLOADS OF WHEAT SHIPPED EACH MONTH BY ILLINOIS COUNTRY ELEVATORS DURING 1925-26

Crop reporting districts	Number of elevators reporting	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
Northwest.....	20	35.5	17.0	5.0	4.3	4.3	9.9	2.8	3.5	2.1	2.8	9.2	3.5
Northeast.....	13	22.8	31.6	16.5	5.1	6.3	2.5	2.5	3.8	2.5	2.5	2.5	1.3
West.....	12	18.9	28.3	8.5	3.5	7.0	5.0	5.5	5.0	2.0	3.0	8.9	4.5
Central.....	20	40.7	19.1	4.9	5.3	4.1	6.1	3.3	2.4	3.3	2.8	6.5	1.6
East.....	41	43.1	32.5	10.2	2.0	1.5	4.1	1.5	1.5	.5	.5	1.0	1.5
West-southwest..	21	40.9	18.0	6.5	4.9	6.0	4.1	5.2	3.2	3.2	2.8	2.5	2.8
East-southeast...	14	53.2	14.1	4.5	1.9	10.9	2.6	5.8	.6	1.3	1.3	1.3	2.6
South.....	11	29.3	10.6	6.7	3.4	3.4	10.1	4.8	5.3	4.3	3.4	10.6	8.2
State.....	152	37.3	20.1	7.0	4.0	5.4	5.4	4.3	3.0	2.7	2.6	4.9	3.2

TABLE 29.—PERCENTAGE OF ANNUAL CARLOADS OF CORN SHIPPED EACH MONTH BY ILLINOIS COUNTRY ELEVATORS DURING 1925-26

Crop reporting districts	Number of elevators reporting	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
Northwest.....	20	2.9	7.1	4.5	6.7	13.4	14.0	16.7	13.0	6.0	2.4	3.4	10.0
Northeast.....	13	3.7	9.5	7.1	9.5	12.8	11.8	12.8	8.1	4.6	1.4	6.4	12.3
West.....	12	3.2	3.7	8.0	15.2	6.6	12.6	11.5	10.9	9.5	3.7	5.2	9.8
Central.....	20	5.2	10.6	9.3	7.1	10.6	10.9	9.0	6.8	7.1	4.1	8.7	10.6
East.....	41	4.9	10.9	8.9	8.3	10.1	13.2	9.7	7.0	4.3	2.6	6.4	13.6
West-southwest..	21	2.3	6.0	5.1	4.2	15.2	20.5	16.5	5.6	7.5	6.9	7.1	3.2
East-southwest..	14	3.5	5.6	10.0	8.5	18.5	12.7	6.2	5.2	4.6	5.8	6.4	12.9
South.....	11	5.1	6.6	4.7	9.5	19.0	19.0	8.8	5.1	4.4	5.5	6.2	6.2
State.....	152	4.3	9.3	8.0	8.0	11.7	13.6	11.0	7.5	5.5	3.4	6.5	11.2

TABLE 30.—PERCENTAGE OF ANNUAL CARLOADS OF OATS SHIPPED EACH MONTH BY ILLINOIS COUNTRY ELEVATORS DURING 1925-26

Crop reporting districts	Number of elevators reporting	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
Northwest.....	20	13.8	20.5	9.6	5.4	6.2	8.3	7.4	7.6	7.4	5.1	3.6	5.1
Northeast.....	13	9.5	13.5	6.1	6.1	5.5	8.9	11.6	9.1	6.5	7.8	6.3	9.1
West.....	12	22.9	18.6	4.4	2.2	5.5	6.0	10.9	2.7	4.4	3.8	9.3	9.3
Central.....	20	12.3	19.1	4.2	3.0	7.8	4.2	6.1	10.5	6.6	9.5	8.4	8.3
East.....	41	11.1	10.6	8.3	7.1	4.0	5.5	6.0	7.1	7.7	9.4	10.4	12.9
West-southwest..	21	4.6	31.8	4.6	13.6	...	4.6	15.9	6.8	...	4.6	...	13.6
East-southeast...	14	24.1	12.0	8.3	2.8	2.8	10.2	2.8	25.9	.9	4.6	1.9	3.7
South.....	11	0	0	0	0	0	0	0	0	0	0	0	0
State.....	152	12.3	14.4	7.2	5.8	5.1	6.3	7.3	8.4	6.8	8.1	8.2	10.1

TABLE 31.—PERCENTAGE OF ANNUAL CARLOADS OF CORN, OATS, AND WHEAT SHIPPED EACH MONTH BY 72 FARMERS' AND 49 PRIVATE ELEVATORS IN CENTRAL AND EASTERN ILLINOIS, JULY, 1923 TO JUNE, 1925

Month and year	Corn			Oats			Wheat		
	Farmers' elevators	Private elevators	Excess of farmers' over private	Farmers' elevators	Private elevators	Excess of farmers' over private	Farmers' elevators	Private elevators	Excess of farmers' over private
<i>1923</i>									
July.....	8.6	7.3	1.3	5.4	3.5	1.9	24.7	24.3	.4
Aug.....	5.6	4.7	.9	13.9	17.9	-4.0	48.4	51.6	-3.1
Sept.....	8.4	6.4	2.0	7.3	9.4	-2.1	10.3	12.5	-2.2
Oct.....	5.9	5.2	.7	3.3	5.9	-2.6	3.5	4.6	-1.1
Nov.....	9.2	10.8	-1.6	3.6	3.7	-.1	1.9	1.5	.4
Dec.....	4.1	4.1	0	5.7	3.8	1.9	1.5	.7	.8
<i>1924</i>									
Jan.....	12.4	14.5	-2.1	13.0	8.3	4.7	1.4	1.1	.3
Feb.....	11.1	14.9	-3.8	10.0	11.3	-1.3	1.9	1.0	.9
Mar.....	5.9	7.4	-1.5	9.9	10.7	-.8	1.2	.7	.5
April.....	7.0	5.8	1.2	10.5	9.2	1.3	1.0	.5	.5
May.....	9.6	8.0	1.6	9.0	9.6	-.6	1.7	.4	1.3
June.....	12.2	10.9	1.3	8.4	6.7	1.7	2.5	1.1	1.4
Total.....	100.0	100.0	0	100.0	100.0	0	100.0	100.0	0
<i>1924</i>									
July.....	8.8	8.2	.6	5.3	2.5	2.8	11.4	11.1	.3
Aug.....	4.6	4.5	.1	29.0	30.4	-1.4	55.6	56.4	-.8
Sept.....	10.0	8.1	1.9	9.8	14.4	-4.6	10.1	13.6	-3.5
Oct.....	9.8	6.8	3.0	5.5	5.0	.5	7.3	7.7	-.4
Nov.....	10.0	9.8	-.02	2.9	3.0	.1	3.8	2.1	1.7
Dec.....	13.5	13.8	-.3	7.8	4.8	3.0	2.4	2.1	.3
<i>1925</i>									
Jan.....	17.5	19.7	-2.2	8.3	7.8	.5	3.0	4.3	-1.3
Feb.....	5.1	7.1	-2.0	4.2	4.4	-.2	1.1	1.1	0
Mar.....	5.2	5.2	0	6.2	7.6	-1.4	.9	.2	.7
April.....	3.0	4.4	-1.4	5.1	9.9	-4.8	.6	.4	.2
May.....	7.4	5.7	1.7	9.7	6.7	3.0	3.1	.6	2.5
June.....	5.1	6.7	-1.6	6.2	3.5	2.7	.7	.4	.3
Total.....	100.0	100.0	0	100.0	100.0	0	100.0	100.0	0





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