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FARM STORAGE AS A FACTOR IN THE MARKETING OF KANSAS WHEAT

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SUMMARY

1. As an average of six recent crop years, the Kansas farmer has marketed around 20 to 30 percent of his crop out of season, in so far as meeting mill and export needs is concerned.

2. An orderly marketing of the crop on the part of the producers, therefore, will mean that they must assume responsibility for storage, and temporarily continue the ownership of 20 to 30 percent more of the crop than they have in the past.

3. The independent opinions of large groups of farmers as to what the wheat market is going to do has a very marked effect in determining when the heavy or surplus marketing period will come, and this group opinion is not always founded on good information. Nor do farmers yet have locally any good means for interpreting what information there is available to them.

4. In general, farm storage space for wheat in Kansas is fairly adequate for a crop up to nearly 50 percent above average.

5. In a survey of 743 farms scattered over 29 Kansas counties, it was found that 5 percent of the farmers had no storage space. Twenty percent reported some shortage of space for the 1920 crop.

6. Out of 1,140,942 bushels of wheat reported, 196,695 bushels, or 17.2 percent, was sold direct from the threshing machine.

7. Of the wheat marketed direct from the machine, 81 percent was hauled an average distance of 3.6 miles, 15.2 percent an average distance of eight miles, and 3.8 percent an average distance of 16 miles.

8. An average of farmers' estimates, as to what was the maximum distance wheat could be hauled economically direct from the machine, where only ordinary equipment and labor forces are available, was found to be 3¾ miles.

9. From 50 to 60 percent of the wheat area of the state is farther than 3¾ miles from a local elevator station and therefore outside of the radius where the bulk of wheat marketing can be done economically direct from the machine.

10. Limited local elevator storage space, a likely limited grain car movement, and the distance of 50 to 60 percent of the wheat area from local elevator stations, point to the economic necessity of farm storage in handling Kansas wheat.

11. The status of farm storage in Kansas, together with a consideration of the ample terminal storage facilities of the country, would seem to suggest that the economic function of the local eleva-

tor, in the main, is that toward which it has developed in the last 25 to 30 years; namely, that of handling grain rather than warehousing it.

12. From the standpoint of storage alone, from 60 to 80 percent of the Kansas wheat crop can be handled most economically the first one-fourth to one-half of the crop year, by passing through adequate farm storage facilities.

13. In spite of its relative economy, the serious problem in farm storage of wheat to be solved, is that of financing the holding of the commodity on the farm. Of 616 farms finally reporting on the question, 57 percent reported having to borrow money in order to hold their wheat. The average loan per farmer for wheat-holding purposes only was $1,170.

14. With average loans for wheat storage of from $1,000 to $2,000 per farmer, the present problem of financing farm storage of wheat is probably much more one of supply of funds than of interest rates. A saving of 2 to 3 percent on $2,000. will not justify an extensive abandonment of farm storage facilities for local station storage facilities at new and additional costs.

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FARM STORAGE AS A FACTOR IN THE MARKETING OF KANSAS WHEAT[1]

R. M. GREEN

BUYERS' AND SELLERS' MARKETS

When the wheat grower comes to market his grain he finds a market very different from the one on which he buys most of his farm supplies. Yet, most wheat growers fail to realize that they have much to do with making this market.

As soon as wheat is threshed farmers begin selling, not to accommodate the demands of any particular group of customers but to accommodate themselves. This is exactly the situation at any auction. The buyer in this case names the price. Since the conditions which determine the number of buyers and their attitude may change greatly from day to day, wide fluctuations in prices are at times inevitable.

One would hardly expect to hold a two-day sale out on the farm even and get a set of bidders the second day that would bid exactly the same price as the bidders of the first day did, even if the objects bid on were the same.

In the United States 600 to 700 million bushels of wheat are threshed and ready for market in a period of from 60 to 90 days. If a large part of this output is offered for sale as soon as it is ready for the market, there must be some bidders who have no immediate use for what they are buying. Their only incentive to buy is the prospect of selling later at a higher price. If they do not have such a prospect they stay out of the market.

The farmer would like to sell on a market just the reverse of the one described. Such a market is one where the buyer has less weight in naming the price, where prices do not fluctuate so much in line with the number of bidders at any particular short period of time, and where the price received for the raw product is closer to the price of the finished product. In any business such a market means selling from storage—from a certain stock that it is always necessary to carry.

NOTE.—This report is the first of a series that will have as their purpose a thorough analysis of the markets for Kansas wheat, and the problems involved in reaching these markets.

[1] Contribution No. 4 from the Department of Agricultural Economics.

PURPOSE OF THIS STUDY

The purpose of this bulletin is to point out first, the importance of the wheat storage problem in any attempt to give the wheat grower a more satisfactory market. Second, to show how this storage problem arises and how big a problem it is for Kansas wheat growers. Third, to indicate what would have to be done to solve this storage problem, and more particularly in this first report to indicate the importance of farm storage as a factor in the marketing of Kansas wheat.

THE WHEAT STORAGE PROBLEM

The first problems encountered in the marketing of wheat are those having to do with the storage of the grain while it is awaiting movement to points of commercial consumption. The mills and the export trade are the chief final outlets for the raw wheat of this country. The proportion of wheat going to seed houses, feed concerns, etc., is insignificant. At any given time, therefore, the wheat in excess of the mill and export demand must be stored somewhere and by somebody until needed.

In the past, the farmer has assumed only a small part of the burden of storing this wheat. In general, he has preferred, or has been compelled by force of circumstances, to sell a part of his wheat as quickly as possible without regard to how rapidly it could be utilized. By far the larger part of the wheat stored by farmers has been stored on the farm, where on the average 75 to 80 percent of the Kansas wheat crop is at least temporarily stored. With producers planning to assume more of the storage function, questions naturally arise as to where most of the wheat should be stored. How big a problem is this for Kansas wheat growers? How adequate is the supply of storage space on farms? How important will farm storage continue to be? In how big an area is it of prime importance? What is the cost of farm storage? Should storage space at local shipping points be increased? Are more terminal storage facilities needed? These are some of the specific questions that need to be answered before present practice can be intelligently altered.

THE MARKET FOR KANSAS WHEAT

A study of the Kansas wheat grower's market leads immediately to a study of mill demand and export demand for the wheat crop of the United States. These are the two main outlets for his crop.

TABLE I.—THE MARKET FOR WHEAT

(Figures for the United States in millions of bushels)

	Crop year						Average for six years
	1914-15	1915-16	1916-17	1917-18	1918-19	1919-20	
Wheat carried over from year before	84	62	177	55	21	48	75
Wheat crop	891	1026	636	637	921	934	841
Total supply	975	1088	813	692	942	982	916
Carried to next year	62	177	55	21	48	108	79
Used during year	913	911	758	671	894	874	837
Used on farms	104	153	95	102	119	100	112
Used in commerce	809	758	663	569	775	774	725
Exported (net)	259	168	126	7	168	117	141
Used commercially in the United States	550	590	537	562	507	657	584
Milled (estimated) (*a*)	533	574	543	539	568	600	560

(*a*) Figures on annual milling furnished through courtesy of The Northwestern Miller. Figures from January, 1914, to May, 1920, are based on reports of the United States Grain Corporation, supplemented by reports to The Northwestern Miller. Figures for the period after May, 1920, are based on reports to The Northwestern Miller and calculations by Russel's Commercial News. The other data in this table are based on figures given in a Report of the Federal Trade Commission on Commercial Wheat Flour Milling and on figures given in the Yearbook of the United States Department of Agriculture for 1920.

(Table I.) Out of an average crop for the United States of 841 million bushels, 4 million bushels were added to the stock of wheat carried from one crop year into the next. Of the remaining 837 million bushels, 112 million were used on farms for seed and feed. Of the 725 million bushels going into commercial use, 141 million were taken by exporters and 560 million ground by the mills of the United States. Approximately 24 million bushels, or only 3 percent, went for other commercial purposes or are unaccounted for.

In considering the wheat shortage problem, then, it is important to understand as far as possible the needs and wants of these two classes of customers. Is the rate of mill and export demand regular enough to be anticipated with any degree of accuracy? If so, there is at least the possibility of selling more nearly in line with commercial consumption of wheat.

RATE AND REGULARITY OF MILL DEMAND

The extreme variation in the amount of wheat ground annually by mills in the United States during the crop years 1914-15 to 1919-20 was about 13 percent; i. e., from 533 million bushels in 1914-15 to 600 million bushels in 1919-20. The number of bushels ground in the other years were as follows: In 1915-16, 574 million

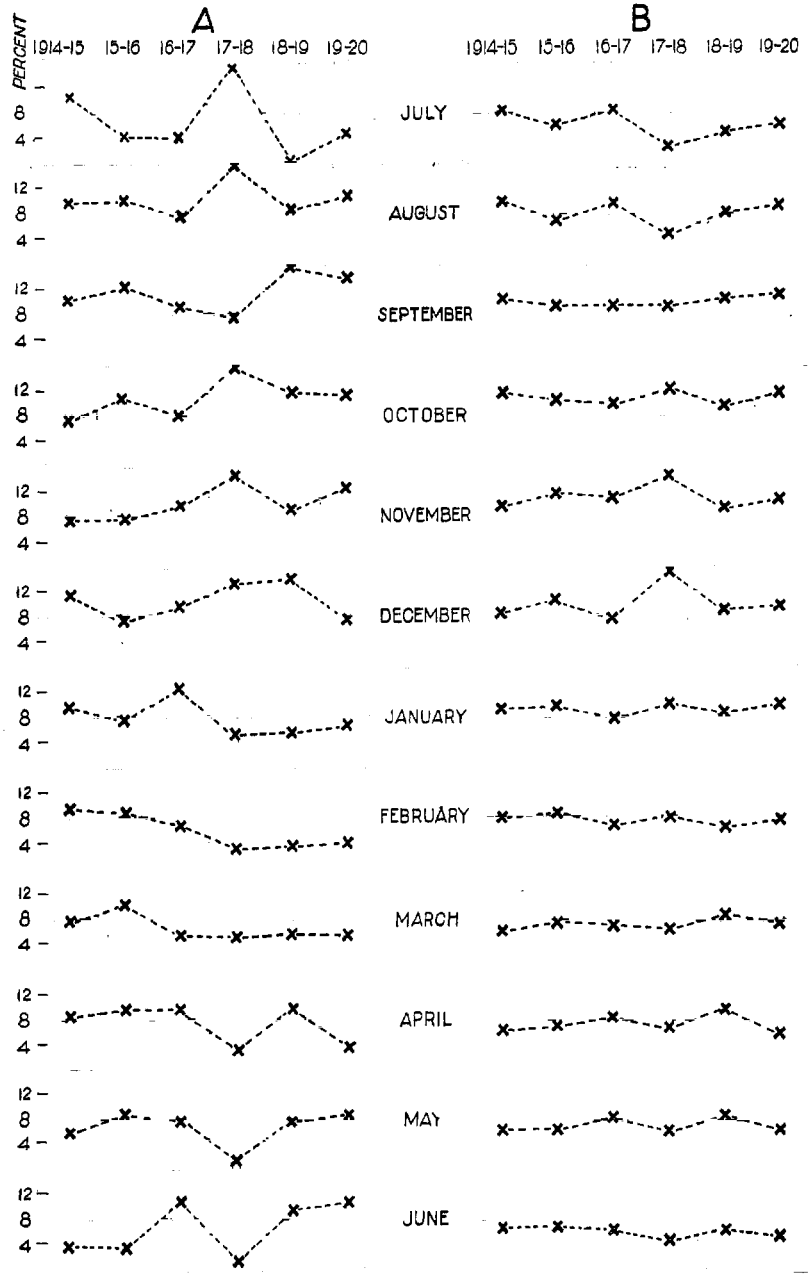

FIG. 1.—Comparative steadiness of mill and export demands during a six-year period. (A) Monthly fluctuation in wheat exports in percent of total annual exports. (B) Monthly fluctuation in mill output in percent of total annual mill output

bushels; in 1916-17, 543 million bushels; in 1917-18, 539 million bushels; and in 1918-19, 568 million bushels.

In general, August to January inclusive, are the six months of heavy mill consumption, and February to July are the months of light mill consumption. For the six years studied, the lightest milling month came in March and April one year, in June two years, and in July three years. The heaviest milling month came in September one year, in October two years, in November two years, and in December one year. However, in the six heavy milling months but little more than one-half of the year's grinding took place. (Table II.)

TABLE II.—WHEAT MILLED IN THE UNITED STATES BY SIX-MONTH PERIODS, IN PERCENT OF YEAR'S TOTAL MILLING

SIX-MONTH PERIOD	Crop year					
	1914-15	1915-16	1916-17	1917-18	1918-19	1919-20
August to January, inclusive	58.8	58.1	55.4	65.6	55.4	61.9
February to July, inclusive	41.2	41.9	44.6	34.4	44.6	38.1
	100.0	100.0	100.0	100.0	100.0	100.0

In 1914-15 the number of bushels of wheat ground per month in the United States fluctuated from 6.2 percent of the total annual requirements in each of the months March and April to 11.1 percent of the total annual consumption in October. In 1915-16 the fluctuation was from 6 percent in July to 11.7 percent in November; in 1916-17 from 6.3 percent in June to 10.9 percent in November; in 1917-18, from 2.5 percent in July to 14.9 percent in December; in 1918-19, from 5.0 percent in July to 10.4 percent in September; and in 1919-20, from 5.3 percent in June to 11.8 percent in October. (Table III.) The mill demand for wheat any specified month during the six years has been comparatively steady. (Fig. 1.)

TABLE III.-MONTHS OF LIGHT AND HEAVY MILLING OF WHEAT AND PERCENT OF THE YEAR'S SUPPLY REQUIRED BY MILLS IN THE UNITED STATES IN THOSE MONTHS

	Crop year					
	1914-15	1915-16	1916-17	1917-18	1918-19	1919-20
Lightest milling month	March and April	July	June	July	July	June
Percent of year's requirements used	6.2	6.0	6.3	2.5	5.0	5.3
Heaviest milling month	Oct.	Nov.	Nov.	Dec.	Sept.	Oct.
Percent of year's requirements used	11.1	11.7	10.9	14.9	10.4	11.8

RATE AND REGULARITY OF WHEAT EXPORTS

The amount of domestic whole wheat that there will be for export depends mostly upon the size of the wheat crop in the United States. The demand for this wheat depends upon market conditions in foreign countries. The export outlet for wheat is therefore a less steady factor from the standpoint of both supply and demand than the outlet through domestic mills. (Fig. 1,A.) During the six-year period studied, total annual exports varied from 34 million bushels for the crop year 1917-18, to 260 million bushels in 1914-15. Exports for other years were as follows: In 1915-16, 173 million bushels; in 1916-17,150 million bushels; in 1918-19, 179 million bushels; and in 1919-20, 122 million bushels. These exports compare with an average of 53 million bushels of whole wheat for the years 1909-1913. Exports of whole wheat for eight months of the crop year, 1920-21, up to and including February, 1921, amounted to 170 million bushels, As long as Russia is out of the market, it looks as if our exports will be maintained at these higher figures, either in the form of wheat or flour, size of crops in the United States permitting.

Fluctuation in volume of exports for the years studied has been caused to some degree by shipping difficulties growing out of the war. Especially is this true for the crop year 1917-18 and later. Also the amount of wheat that is exported as raw wheat or is exported as flour is influenced to some extent by the difference in ocean freight rates on flour and wheat and by milling conditions and output in foreign countries. As an average for the years, 1909-1913 inclusive, 53 percent of the wheat and flour exported from the United States was in the form of whole wheat. In 1914, 75 percent of the wheat and flour exported was in the form of whole wheat; in 1915, 74 percent; in 1916, 70 percent; in 1917, 62 percent; and in 1918, 53 percent.

In general, August to January inclusive, are the months of heavy exports, and February to July inclusive, are the months of light exports. (Table IV.) The lightest exporting month was June, two years out of the six; two years it was July; one year, April, and one year, May. The heaviest exporting month was September, three years out of six; one year it was October; one year, December; and one year, January.

TABLE IV.—DOMESTIC WHEAT EXPORTED FROM THE UNITED STATES BY SIX-MONTH PERIODS IN PERCENT OF TOTAL ANNUAL EXPORTS

SIX-MONTH PERIOD	Crop year					
	1914-15	1915-16	1916-17	1917-18	1918-19	1919-20
August to January, inclusive.....	54.7	55.3	55.9	71.5	64.0	62.8
February to July, inclusive.....	45.3	44.7	44.1	28.5	36.0	37.2
	100.0	100.0	100.0	100.0	100.0	100.0

In 1914-15 the proportion of annual wheat exports taking place month by month varied from 3.7 percent in June to 11.1 percent in December. In 1915-16, the fluctuation was from 3.4 percent in June, to 12.4 percent in September; in 1916-17, from 4.2 percent in July, to 12.6 percent in January. In 1917-18 and 1918-19, the fluctuation was abnormally wide. In the former year it ranged from 1.3 percent of total annual exports in May to 15.9 percent in October. In the latter year, the range was from 0.1 of 1 percent in July, to 15.1 percent in September. In 1919-20, the fluctuation was less extreme—from 3.4 percent in April, to 13.9 percent in September. (Table V.)

TABLE V.—EXPORT OF DOMESTIC WHOLE WHEAT FROM THE UNITED STATES DURING LIGHT AND HEAVY EXPORTING MONTHS, IN PERCENT OF TOTAL ANNUAL EXPORTS

	Crop year					
	1914-15	1915-16	1916-17	1917-18	1918-19	1919-20
Lightest exporting month.....	June	June	July	May	July	April
Percent of annual exports.....	3.7	3.4	4.2	1.3	0.1	3.4
Heaviest exporting month.....	Dec.	Sept.	Jan.	Oct.	Sept.	Sept.
Percent of annual exports.....	11.1	12.4	12.6	15.9	15.1	13.9

CONBINED MILL AND EXPORT DEMAND

For six-month periods, the rate of combined mill and export demand has been remarkably steady. (Table VI.) The steadiness of

TABLE VI.—TOTAL WHEAT MILLED AND EXPORTED BY SIX-MONTH PERIODS, IN PERCENT OF ANNUAL TOTALS FOR THE UNITED STATES

SIX-MONTH PERIOD	Crop year					
	1914-15	1915-16	1916-17	1917-18	1918-19	1919-20
August to January, inclusive.....	57.5	57.5	55.5	55.9	57.5	62.1
February to July, inclusive.....	42.5	42.5	44.5	44.1	42.5	37.9

the rate at which wheat was consumed commercially in any specified month during the six years is shown as follows:

In three Julys out of six, 5 to 7 percent of the year's wheat was used
In five Augusts out of six, 8 to 10 percent of the year's wheat was used
In four Septembers out of six, 10 to 12 percent of the year's wheat was used
In five Octobers out of six, 10 to 12 percent of the year's wheat was used
In five Novembers out of six, 9 to 11 percent of the year's wheat was used
In five Decembers out of six, 8 to 10 percent of the year's wheat was used
In six Januarys out of six, 8 to 10 percent of the year's wheat was used
In five Februarys out of six, 6 to 8 percent of the year's wheat was used
In six Marchs out of six, 6 to 8 percent of the year's wheat was used
In three Aprils out of six, 6 to 8 percent of the year's wheat was used
In five Mays out of six, 6 to 8 percent of the year's wheat was used
In five Junes out of six, 5 to 7 percent of the year's wheat was used

These figures emphasize the fact that with a knowledge of crop conditions and business conditions in general, demand for wheat is not so erratic or so irregular but what it can be anticipated with at least some degree of accuracy.

The actual number of bushels of wheat milled and exported annually, on which the above percents are based, varied considerably. Such figures can be anticipated only in the light of crop prospects, and such general business and political conditions as are likely to induce a larger or smaller carryover than usual.

The commercial demand for wheat has been gone into thus far only for the purpose of determining how the rate of marketing from farms compares with it. To the extent that the wheat marketed from farms does not conform to this commercial demand in time and amounts of wheat, to that extent a storage problem is created for some one to handle.

THE RATE AT WHICH KANSAS FARMERS SUPPLY THE MARKET WITH WHEAT

During the last six years, the Kansas wheat grower has failed to the extent of 25 to 30 percent of his crop to market in accord with commercial demand.

The monthly rate at which local elevators purchase wheat from farmers would give an accurate record of the rate at which farmers market their wheat. In the absence of a sufficient volume of data of this kind, terminal market receipts may be turned to under certain conditions. If the bulk of wheat coming to any one large terminal market is from Kansas, the rate at which wheat is received at that market is a good indication of the rate at which

Kansas farmers are marketing their wheat. About 55.3 percent of all grain coming to the Kansas City market comes from Kansas. There would be, no doubt, about as large a percent of the total Kansas City wheat receipts coming from Kansas.

After repeated tests and checks, Kansas City wheat receipts were found to be a good indicator of the rate at which Kansas farmers supply their market with wheat. Working from this basis, it was found that for the last six crop years, the Kansas farmer has marketed during the first six months of the crop year from 60 to 80 percent of the wheat he sells. (Table VII.) This rate of supply is

TABLE VII.—WHEAT SOLD BY KANSAS FARMERS DURING SIX-MONTH PERIOD, IN PERCENT OF TOTAL SALES FOR THE YEAR

SIX-MONTHS PERIOD	Crop year					
	1914-15	1915-16	1916-17	1917-18	1918-19	1919-20
July to December, inclusive.....	80.5	61.8	74.0	86.1	87.4	70.7
January to June, inclusive.....	19.5	38.2	26.0	13.9	12.6	29.3
	100.0	100.0	100.0	100.0	100.0	100.0

comparable with the rate of demand, 55 to 60 percent, shown in Table VI. Although not figured on identically the same basis, the two bases are nearly equal quantitatively.

RATE OF MARKETING WHEAT FROM KANSAS FARMS COMPARED WITH RATE OF COMMERCIAL CONSUMPTION

It has already been noted that all but a very small percent of the wheat marketed by farmers is used commercially by the mills of the country and by the export trade. Their combined demand at any time indicates the rate at which there is a demand for wheat for commercial consumption. To show how close the Kansas farmer has come to meeting the consumptive demand for wheat as regards time and quantities of wheat, a comparison has been made in Table VIII. The columns headed "Demand" show the monthly mill and export requirements in percent of the total annual requirement. The columns headed "Supply" show the corresponding proportion of this amount of wheat the Kansas farmer puts on the market month by month to supply these commercial needs. The difference between these two columns (expressed as either excess demand or excess supply) indicates the excess or shortage of farm offerings as compared with commercial demands.

TABLE VIII.—RATE OF FARM MARKETING OF WHEAT COMPARED WITH RATE OF COMMERCIAL CONSUMPTION BY CROP YEARS EXPRESSED IN PERCENT OF TOTAL MILL AND EXPORT DEMAND

CROP YEAR	1914–15				1915–16				1916–17			
	Demand (a)	Supply (b)	Excess		Demand (a)	Supply (b)	Excess		Demand (a)	Supply (b)	Excess	
			Demand	Supply			Demand	Supply			Demand	Supply
July	8.8	14.5	.....	5.7	5.6	5.9	.....	.3	7.3	11.3	.....	4.0
August	9.7	16.8	.....	7.1	7.7	9.3	.....	1.6	9.2	17.6	.....	8.4
September	10.3	17.1	.....	6.8	9.9	11.7	.....	1.8	9.1	11.5	.....	2.4
October	9.9	10.8	.....	.9	10.4	10.8	.....	.4	9.5	11.2	.....	1.7
November	8.8	13.9	.....	5.1	10.8	17.8	.....	7.0	10.6	9.1	1.5	.....
December	9.5	7.4	2.1	.....	9.5	14.8	.....	5.3	8.2	5.9	2.3	.....
January	9.3	4.0	5.3	.....	9.2	10.7	.....	1.5	8.9	6.1	2.8	.....
February	8.4	2.5	5.9	.....	8.1	9.2	.....	1.1	6.5	4.1	2.4	.....
March	6.8	1.7	5.1	.....	8.2	5.1	3.1	.....	6.7	3.8	2.9	.....
April	6.9	3.1	3.8	.....	7.5	5.9	1.6	.....	8.5	3.7	4.8	.....
May	6.0	4.3	1.7	.....	6.9	8.1	.....	1.2	8.2	4.1	4.1	.....
June	5.6	3.9	1.7	.....	6.2	4.4	1.8	.....	7.3	1.7	5.6	.....
	100.0	100.0	25.6	25.6	100.0	113.7	6.5	20.2	100.0	90.1	26.4	16.5

(a) Wheat requirements of mills and exporters.
(b) Wheat put on the market by Kansas farmers.

TABLE VIII.—CONCLUDED

CROP YEAR	1917–18				1918–19				1919–20			
	Demand (a)	Supply (b)	Excess		Demand (a)	Supply (b)	Excess		Demand (a)	Supply (b)	Excess	
			Demand	Supply			Demand	Supply			Demand	Supply
July	3.2	17.4	.....	14.2	4.2	27.8	.....	23.6	5.9	16.5	.....	10.6
August	5.6	21.5	.....	15.9	8.2	31.1	.....	22.9	9.4	22.8	.....	13.4
September	9.2	10.6	.....	1.4	11.5	13.3	.....	1.8	11.5	12.2	.....	.7
October	12.3	14.4	.....	2.1	10.4	8.2	2.2	.....	11.7	7.3	4.4	.....
November	14.4	15.1	.....	.7	9.2	4.8	4.4	.....	10.9	10.4	.5	.....
December	14.8	7.1	7.7	.....	10.2	5.6	4.6	.....	9.2	9.2	.....	.....
January	9.6	4.3	5.3	.....	8.0	3.2	4.8	.....	9.4	8.1	1.3	.....
February	7.5	2.8	4.7	.....	5.6	2.5	3.1	.....	6.7	5.1	1.6	.....
March	6.6	2.9	3.7	.....	7.9	1.9	6.0	.....	6.8	6.3	.5	.....
April	6.4	1.8	4.6	.....	9.5	2.3	7.2	.....	5.4	2.7	2.7	.....
May	5.8	1.3	4.5	.....	8.5	1.8	6.7	.....	6.9	5.0	1.9	.....
June	4.6	.8	3.8	.....	6.8	1.2	5.6	.....	6.2	5.3	.9	.....
	100.0	100.0	34.3	34.3	100.0	103.7	44.6	48.3	100.0	110.9	13.8	24.7

Table VIII is presented as an approximately correct statement of a market situation not entirely exposed in figures. Practical variations caused by local differences in demand and the lack of equally good transportation facilities for grain from all sections are of course discounted in these figures.

Referring to Table VIII, it will be noted that in the crop year 1914-15, 26 percent of the crop marketed was marketed by the farmers before it was needed for commercial consumption. This is shown by the 25.6 percent excess supply coming from farms from July to November, inclusive, and the demand for 25.6 percent in excess of farm supply coming from mills and exporters in the months, December to June, inclusive. The total farm supply for the year just about satisfied total mill and export demand. This is expressed by the supply column totaling 100 percent of the demand on which it was figured.

In 1915-16, about 14 percent more wheat was put on the market than was consumed by mills and the export trade. Of the wheat utilized by mills and exporters, 20 percent was out of the hands of the farmer before there was commercial need for it. The months of oversupply from farms came later in the year than usual, being in November and December. This was largely because of wet weather at harvest and because many farmers remembered that those farmers who waited and sold their wheat in November, December, and January the year before, got $1.25 to $1.30 a bushel, while those who sold at threshing time got 60 to 70 cents a bushel.

In 1916-17, 17 percent of the crop that could be sold was marketed out of season, although the total marketable crop of the country lacked 10 percent of meeting the mill and export demand for the year. The season of oversupply was again back to the normal months of July, August, and September.

During the next three crop years, under the stimulus of a government guaranteed price, surplus marketing was further concentrated in the months of July and August.

The average monthly demand of mills and exporters for wheat for the six-year period of 1914-15 to 1919-20, inclusive, is shown in Table IX. The figures for each month give the number of bushels out of each 1,000 bushels needed during the entire year, which were used during that month. The rate at which farmers supplied these needs is also shown. As an average of six years, the annual supply

TABLE IX.—MONTHLY REQUIREMENTS OF MILLS AND EXPORTERS FOR WHEAT AND MONTHLY MARKETINGS OF WHEAT BY KANSAS FARMERS

(Av. of crop years 1914-15 to 1919-20, inclusive)

MONTH	Bus. of wheat utilized each month by mills and exporters out of each 1,000 bus. used during the year	Bus. of wheat sold locally by Kansas farmers to supply mill and export demand	Excess of farm offerings for each 1,000 bus. used during the year	Shortage of farm offerings for each 1,000 bus. used
July	60	138	78	..
August	84	174	90	..
September	103	123	20	..
October	107	92	..	15
November	107	106	..	1
December	100	78	..	22
January	90	95	5	..
February	71	42	..	29
March	72	35	..	37
April	74	32	..	42
May	70	42	..	28
June	62	73	11	..
	1,000	1,030	204	174

of wheat from farmers exceeded mill and export demand by only 3 percent. At the same time the farmer marketed about 20 percent of what he could sell at the wrong season to meet the commercial demand.

Notwithstanding the fact that pressing financial obligations and tenant farming in general force an early marketing of some wheat, the season of surplus marketing is affected very largely by what a large mass of farmers think the wheat market is going to be.

From 20 to 30 percent of the wheat marketed from Kansas farms is ordinarily sold before there is a commercial need for it. An orderly marketing of the Kansas wheat crop on the part of the growers, therefore, means that they must assume the responsibility of storing and holding somewhere from 20 to 30 percent more of their wheat than they have in the past, provided, of course, they can satisfy commercial needs from storage as readily as existing agencies have in the past.

It is difficult to say to what extent any such orderly marketing of grain will go toward stabilizing prices. There are certainly many other disturbing factors from time to time. That more orderly marketing will help is generally conceded. This part of the wheat marketing problem is, however, outside the scope of this report which is concerned only with the storage problems involved, and more particularly with the status and outlook for farm storage.

FACTORS DETERMINING THE AMOUNT OF FARM STORAGE

The wheat that cannot be hauled direct from the machine to the elevator must be stored, at least temporarily, on the farm, and therefore calls for farm storage facilities. The amount in any locality or county that can be hauled direct from the machine depends mainly upon three factors: First, the distance of the farms from a loading station; second, the rate of movement of grain cars from local loading points; and third, the storage capacity of local elevators.

All of these factors will tend to hold wheat back on the farms to a greater or less degree. The third of these factors is now of minor importance in relieving farm storage because local elevators in Kansas are, primarily, engaged in merchandising and handling grain, and have ceased almost entirely to do a warehousing business.

WHEAT THAT CAN BE MARKETED ECONOMICALLY DIRECT FROM THE MACHINE

In the fall of 1920, the Department of Agricultural Economics of the Kansas Agricultural Experiment Station conducted a survey of the status and condition of farm storage on 743 Kansas farms in 29 counties. The location of these studies is shown in figure 2.

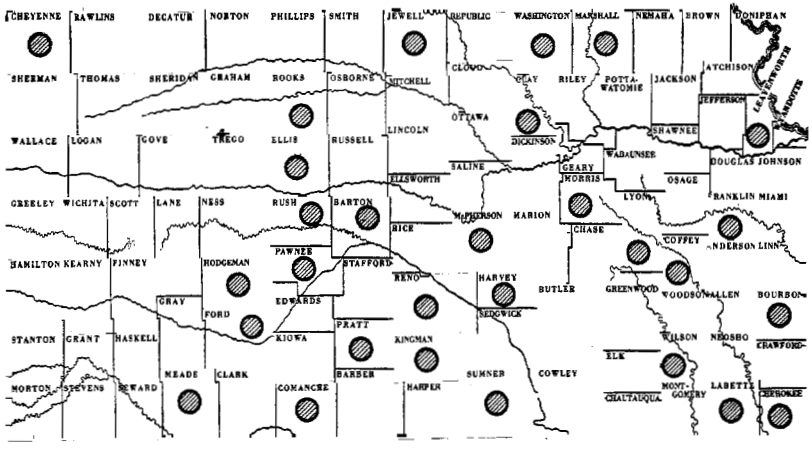

FIG. 2.—Map of Kansas showing the 29 counties in which farm storage of wheat studies were made in 1920-21

In answer to the question, (How close to the railroad station would a farmer have to be to make hauling direct from the threshing machine possible and economical?" the majority of the farmers replied that one would have to be within 3 to 4.5 miles of their sta-

tion. The average was 3.78 miles. Most of these farmers were hauling with teams rather than with trucks. With present and prospective wheat prices, team hauling will be relatively more important for the great majority of farmers for several years at least. At a greater distance than 3¾ miles to 4 miles from the station, the farmer must hire so much extra help to keep the wheat away from the machine, that he finds it more economical to store the wheat on

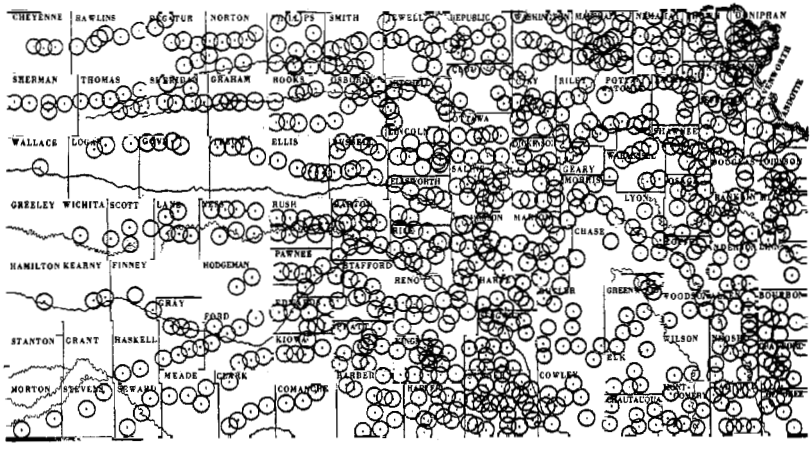

FIG. 3.—Map of Kansas showing territory within and without a radius of 3.78 miles of the elevator stations of the state

his farm, temporarily, and then use his own equipment and regular help to haul at times when they would otherwise be idle. This prevents an extra cash outlay for help or truck hauling and gives employment in slack seasons.

Figure 3 shows the territory within and without a radius of 3.78 miles of every elevator station in the state. The area within the circles represents approximately the territory that could market from the machine in so far as location is concerned. Of course, rate of movement of grain cars from the station and local elevator capacity for handling and storing grain are still further limiting factors. The area outside the circles is mainly territory where farm storage is comparatively important for the most economical handling of grain and will likely continue so. It should be noted here, in connection with figure 3, that some large areas outside the 3¾ mile radius, as in the Flint Hills region of central and eastern Kansas and in the pasture regions of western Kansas, are not important wheat lands but are grazing regions. The assumption,

therefore, is not being made that the areas within and without the circles are exactly proportional to the wheat-producing land within and without the circles. The discrepancies between total area and area of wheat land introduced by such areas as the above, however, are to some degree compensated for when the whole state is considered.

Figure 4 shows the percent of the area of each county within 3.78 miles of an elevator station, or the area within each county, which,

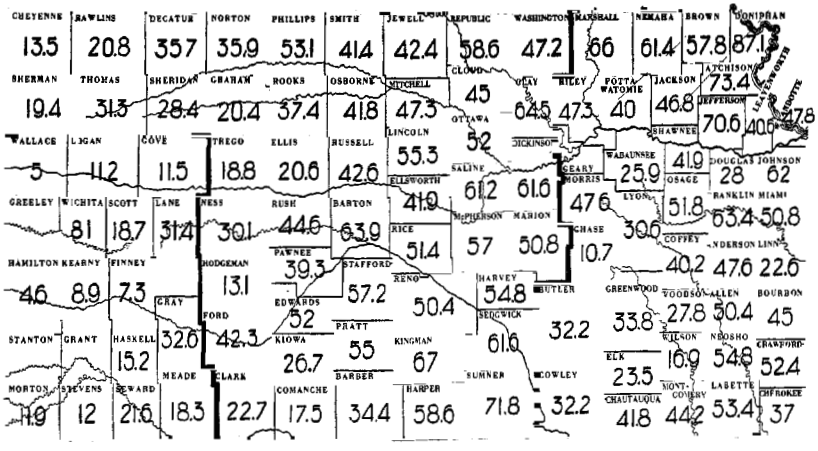

FIG. 4.—Map of Kansas showing percent of area of each county within 3.78 miles of an elevator station. Average for state, 38 percent; average for eastern belt, 43.5 percent; average for central and northwestern belt, 42.1 percent; average for southwestern belt, 13.9 percent

in so far as the one factor of location is concerned, might reach a market economically direct from the threshing machine. The proportion ranges, in typical wheat countries, from near 13 percent in Hodgeman County to 72 percent in Sumner County. The average for the state is 38 percent.

Yet, only a fraction of the wheat within this territory can actually be delivered direct from the machine because of the limited storage and handling facilities of the local elevators. Local elevator capacity, in turn is limited by size of the units and the volume of business necessary for their profitable operation. To allow profitable operation of elevators of the average size of those in Kansas (15,000 to 18,000 bus.), local elevator storage should approximate from one-fourth to one-fifth of the volume of grain to be handled. An annual capacity turnover of four to five is generally necessary for the profit-

able operation of elevators of this size. Approximately 50 to 60 percent of the wheat territory of the state is too far from local stations to be economically marketed direct from the machine, except in the event of pronounced price changes. Local elevator capacity is sufficient to handle, immediately, only one-fourth to one-fifth of the total crop although two-fifths is within easy reach of local markets. It follows, therefore, that farm storage must continue to have an important place in the marketing of Kansas wheat.

A further idea as to the proportion of wheat within easy reach of local markets was gained by asking the following question, "If there were plenty of storage space at the local railroad station, would you haul there direct from the threshing machines?" Of the 450 farmers replying, 42.4 percent answered "yes." Assuming about an equal distribution of wheat between these men and the men who replied "no," it was the opinion of these farmers that approximately 40 percent of their wheat could be economically hauled direct from the threshing machine to the elevator. This figure closely approximates the 38 percent of the area of the state shown to be within 3¾ miles of an elevator station. (Fig. 3.)

To indicate what was actually done, instead of what might be done, data were secured showing the number of bushels of wheat actually sold direct from the machine in 1920, and the total crop of wheat. A record of 1,140,942 bushels of wheat showed 196,695 bushels, or 17.2 percent, sold direct from the machine. Car shortage and an unusual agitation to hold wheat, no doubt reduced the volume of early sales enough to make this percent somewhat lower than usual. This 17.2 percent actually marketed direct from the machine, approximates closely the elevator capacity we might expect to find eventually (20 to 25 percent of the average crop), elevator turnover of four or five times being necessary for profitable operation.

A further study of the data secured showed that of 1,147,041 bushels of wheat reported, 33.3 percent was within 4 miles of a local elevator market.

In trying to get an idea of the area in the state where farm storage is of prime importance, the following facts have been established as a basis:

1. It is the general opinion of farmers that 3¾ miles is about as far as wheat can be economically hauled direct from the machine to the elevator at threshing time, where team hauling is common.

2. By map measurements, 38 percent of the area of the state is within 3¾ miles of a local elevator station; 62 percent farther away.

3. Of 1,147,041 bushels of wheat reported on in the survey, 33.3 percent was within 4 miles of a local elevator station; 66.7 percent farther away.

4. Of the farmers reporting, 42.4 percent of their number said they would haul direct from the threshing machine to the elevator if there wasenough storage room. The other 57.6 percent did not want to haul direct from the threshing machine, thinking, evidently, that it would not pay them to do so.

To determine the extent to which distance from market was a factor in the marketing of wheat at threshing time, a study was made of the location of the wheat making up the 17.2 percent marketed direct from the threshing machine. It was found that 81 percent of this wheat was within 3.6 miles of market, 15.2 percent averaged 8 miles from market, and 3.8 percent averaged 16 miles from market. This shows that all of the approximately 20 percent of the crop that can be and is marketed direct from the machine does not come from within the 3¾ mile radius. There is a small proportion of wheat growers outside this 3¾ mile radius who find it necessary or convenient to market their crop direct from the threshing machine. This may be due to the fact that these growers are tenants and are without storage facilities; they may have to meet pressing financial obligations; or some may have an unusual supply of equipment and labor and find it convenient to market their crop early. In such situations, or in the face of pronounced price changes, there are more urgent considerations than the saving in hauling from the farm to the local market. There are farmers, likewise, within reach of a local station, who could market direct from the machine, but do not do so, because they have previously supplied themselves with storage space on their farms at a time when it was necessary for them to furnish their own storage facilities. In spite of these two exceptions to strict attention to distance from market, it is evident that economy in hauling from the farm is a factor of sufficient consequence to maintain the present importance of farm storage in the marketing of Kansas wheat, for some time at least.

A suggestion to concentrate storage capacity at one point in a county, it seems, would be impractical in most communities this late in the development of the local elevator business. It would involve longer farm hauls than would be economical where the bulk of the wheat can usually be most economically hauled with the farmers' labor and teams. Or else it would mean shipping from former local

elevator points to the central county point. The latter, unless the county point was so strategically located with reference to transportation facilities as to already have the qualifications of an interior terminal, would have little in the way of economy to commend it over movement on to terminal points once the wheat is in cars for shipment.

The country elevator, mill, and terminal storage capacity in the United States is 933 million bushels as reported by the United States Grain Corporation in operation during the war. The total wheat crop of the United States is usually from 700 to 800 million bushels and moves from farms over a period of twelve months. Mills grind and exporters ship more than one-half of the crop in the first six-months. It seems, therefore, that terminal storage facilities are adequate.

The status of farm storage in Kansas together with the terminal storage situation would seem to suggest that the economic function of the local elevator, in the main, is that toward which it has developed in the last 25 or 30 years; namely, that of handling grain, rather than warehousing it. Farm storage and terminal storage are therefore important factors for consideration, in the wheat storage problems in Kansas.

A SURVEY OF STORAGE CAPACITY FOR WHEAT ON KANSAS FARMS

While the survey already made, covers only representative sections of 29 counties, the work has been so distributed that it is believed to be a typical example for the entire state.

One indication of the supply of farm storage in a section is the ratio of bin room for wheat to the bushels of wheat produced and stored. Such a composite figure indicates only community conditions in general and does not show up the individual farms with little or no storage capacity. Tables X and XI are presented to show the situation on a number of Kansas farms from the standpoint of individual farms as well as the community.

TABLE X.—BIN ROOM FOR WHEAT ON KANSAS FARMS COMPARED WITH WHEAT STORED IN 1920, WHEAT PRODUCED IN 1920, AND AN AVERAGE WHEAT CROP

Counties included in survey	Number of farms	Bushels of bin room for each 100 bus. of		
		1920 crop	1920 crop stored	Average annual crop
NORTHWESTERN KANSAS				
1. Barton	25	110	130	150
2. Cheyenne	18	110	120	170
3. Ellis	11	95	110	170
4. Hodgeman	42	130	170	130
5. Rooks	16	90	100	160
CENTRAL AND SOUTHWESTERN KANSAS				
6. Clay	20	140	190	190
7. Comanche	13	220	240	150
8. Ford	23	150	160	130
9. Harvey	12	240	320	160
10. Jewell	41	230	370	260
11. Kingman	33	220	240	160
12. McPherson	15	170	210	160
13. Meade	19	220	310	150
14. Pawnee	19	150	160	150
15. Pratt	20	95	130	(a) 81
16. Reno	26	170	200	160
17. Sumner	46	150	170	150
18. Washington	30	160	230	230
EASTERN KANSAS				
19. Cherokee	12	210	260	200
20. Coffey	51	160	180	180
21. Franklin	40	130	180	130
22. Labette	42	270	370	230
23. Leavenworth	49	120	140	170
24. Lyon	46	110	200	140
25. Marshall	18	130	150	180
26. Morris	28	150	240	150
27. Wilson	9	190	200	140

(a) Influenced by one very large tenant farm included in the averages.

Referring to Table X, column 3, it will be noticed that in the five northwestern counties, bin room on farms as compared with the size of the 1920 wheat crop ranged from 10 percent shortage to a 30 percent surplus. On the whole the margin of storage space over the storage room needed for the whole crop was very small. This, too, is taking into account all farm storage space in the community irrespective of how it is actually distributed among farms. Such a low community margin will necessarily mean a greater shortage in the case of some individuals. In the survey, however, a number of instances were found where a farmer with surplus storage space was allowing his neighbors, who were short on storage space, to store their wheat in his buildings. This, of course, tended to make a fuller use of the storage space in the community although it was not equally distributed.

In the central and southwestern counties studied, bin room on farms, as compared with the size of the 1920 crop, ranged from a 5

TABLE XI.—FARMS SURVEYED HAVING NO WHEAT STORAGE OR INADEQUATE WHEAT STORAGE

County	Percent of reports from tenants	Percent reporting no storage space	Percent reporting inadequate storage	Bin room in terms of 1920 crop	Percent of 1920 crop piled on ground
NORTHWESTERN KANSAS					
1. Barton	28	4	35.9	1.0	0.5
2. Cheyenne	39	6	22.2	1.0	5.0
3. Ellis	9	9	27.5	1.0	.0
4. Hodgeman	24	14	35.7	(a) 1.5	1.5
5. Rooks	0	6	47.1	1.0	5.0
CENTRAL AND SOUTHWESTERN KANSAS					
6. Clay	25	0	20.0	1.5	.0
7. Comanche	39	8	22.2	2.0	1.5
8. Ford	43	8	21.7	1.5	.0
9. Harvey	42	0	16.7	2.5	.0
10. Jewell	29	2	14.6	2.5	.0
11. Kingman	33	3	12.1	2.0	.5
12. McPherson	47	0	13.4	1.5	.0
13. Meade	0	5	13.6	2.0	.0
14. Pawnee	47	0	10.5	1.5	1.5
15. Pratt	30	0	20.0	(b) 1.0	7.0
16. Reno	42	4	11.5	1.5	.0
17. Sumner	47	4	19.6	1.5	.0
18. Washington	37	3	26.7	1.5	.0
EASTERN KANSAS					
19. Cherokee	25	8	16.6	2.0	.0
20. Coffey	29	2	10.0	1.5	.0
21. Franklin	20	3	12.5	1.5	.0
22. Labette	31	2	7.1	2.5	1.5
23. Leavenworth	18	6	24.5	1.0	.0
24. Lyon	20	8	19.6	1.0	.0
25. Marshall	28	6	11.1	1.5	.0
26. Morris	35	7	25.0	1.5	.0
27. Wilson	11	11	22.2	2.0	.0
Average		4.8	19.9		

(a) One and five-tenths times as many bushels of bin room as there were bushels of wheat.
(b) Influenced by one very large tenant farm included in the average.

percent shortage to 140 percent surplus. In the eastern counties, a similar range was from a 10 percent surplus to a 170 percent surplus.

In Table X, the column to the right of the one just referred to, compares bin room on the farm with the part of the 1920 crop stored on the farm or not hauled off at threshing time.

It is evident that the region of shortage in farm storage space in 1920 was confined mainly to northwestern Kansas. There was a smaller area of shortage in parts of eastern Kansas where yields and acreage were above average, but not to the same extent as in the northwest, and generally less serious because of better transportation facilities. (Fig. 5.)

Reference to the right hand column in Table X will also indicate that the main cause of shortage in the northwestern part of the state was a wheat yield very much above average. With average yields, no area of marked shortage in storage space would have been found.

Table XI shows to what extent individual farmers were supplied

with adequate farm storage space. It indicates, in general, that in Kansas farm storage space for wheat is fairly adequate for a crop up to about 50 percent above average. Of the farms reporting, approximately 5 percent reported no storage space for wheat. About 20 percent reported a shortage of space for the 1920 crop. The problem of supply of farm storage space for wheat is, therefore, more or less periodical and is not an especially serious one in the marketing of Kansas wheat, except now and then, locally.

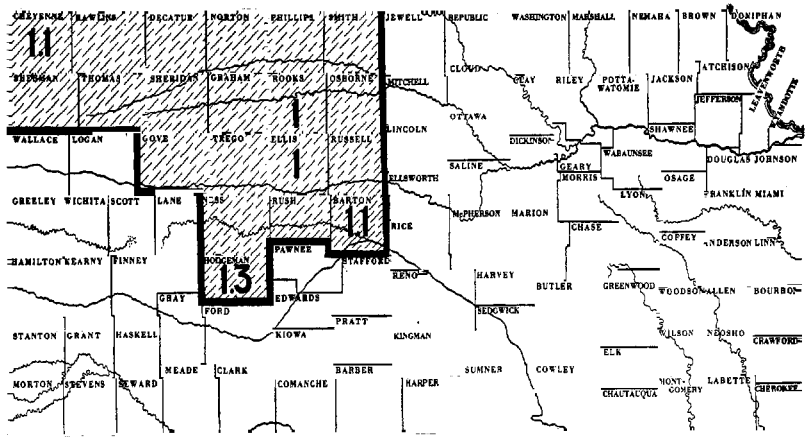

FIG. 5.—Map of Kansas showing approximate area that had marked shortage of wheat storage space on individual farms in 1920 as indicated by a survey of five typical counties. Numbers indicate, as an average for each of the five counties, the bushels of storage space for each bushel of the 1920 wheat crop

FINANCING FARM STORAGE OF WHEAT

In spite of relative economy of farm storage in handling wheat, the serious problem to be solved in connection with it is the financing of the commodity in storage on the farm. In this study of farm storage problems, no attempt is made to go into the entire problem of financing wheat movement within the state. The problem is considered only incidentally in its bearing on the storage of wheat on farms.

Many farmers stated that their problem was not one of having or getting storage space, but more one of getting the credit which would allow them to put their wheat in storage.

Of 616 farmers reporting, 57 percent reported that it was necessary for them to borrow money in order to meet expenses while wheat was being held in storage. The average amount borrowed per

farmer, for this purpose, was $1,170. This amount varied from $630, average in eastern Kansas, to $1,607 in western Kansas. (Table XII.) Corresponding interest rates varied from 8 to 10 percent.

TABLE XII.—AMOUNT BORROWED TO MEET EXPENSES WHILE WHEAT WAS IN STORAGE—1920 WHEAT CROP

	Western Kansas	Central Kansas	Eastern Kansas
Average amount borrowed to meet expenses while wheat was in storage per farmer borrowing	$1607.0	$1355.0	$630.0
Average percent of interest	9.7	8.2	8.0
Percent of farmers reporting who borrowed to meet expenses until wheat was sold	57.0	62.4	49.4
Loans per bushel of wheat stored by borrowers	56 cents	73 cents	83 cents

In the central part of the state 62 percent of the farmers that replied had to borrow to meet expenses until wheat was sold out of storage. The proportion in this section is larger than in the other two sections because here wheat production is relatively a more important part of the farm business.

In the western section a smaller proportion of farmers borrowed for wheat-holding purposes than in the central belt. In this section, wheat growing occupies a less prominent place in the farm business. However, because of the greater risk attached to wheat farming in this section, farmers that need loans, have to borrow heavier than do farmers of the central belt. With a greater demand per farmer, with security for loans often less, and with less funds available, the interest rates in this section are generally higher. Some farmers in this section paid as high as 10 percent interest with interest deducted in advance in the fall of 1920. This was especially true of the smaller farmers, who were storing only a few hundred bushels of wheat.

Bankers in the western section that were conferred with, stated that they did not often make "wheat loans," that is, loans with wheat in storage given as security. They accepted cattle, work stock, machinery, and sometimes growing wheat as security, but not stored wheat. Information was received that some so-called "(wheat loans" were made in parts of the central belt. While therefore it seems that wheat stored on the farm is not generally the basis of loans made to farmers for wheat storage purposes, it is nevertheless interesting to note the size of loan obtained in 1920 as compared

with the amount of wheat stored. (Table XII.) In eastern Kansas the loan obtained for wheat storage purposes was equivalent to 83 cents per bushel of wheat stored. In the central section, the amount was 73 cents per bushel of wheat stored, and in western Kansas, 56 cents per bushel. There was certainly an effort made in the western section in the fall of 1920 to secure larger loans. The high interest rate being paid there, in itself indicates a scarcity of funds compared with the demand for loans. The average local elevator price of wheat during the period of the survey, as secured from farmers' interviews, was $1.40 per bushel. If this figure is taken as a base rather than a price at the various times loans were made, it will be found that farmers in the eastern section had loans for wheat storage purposes up to 60 percent of the value of their wheat. In the central section, loans for wheat storage equalled 52 percent of the value of the wheat stored, and in the western section, 40 percent of the value of stored wheat.

The foregoing indicates the importance of having wheat in the western section and in the western part of the central section, where it is relatively a more important farm asset, serve as the basis for its own financing. Because of the increased importance of the credit problem in this section, the local bonded warehouse, with the attendant possibility of commodity paper financing, may be the only solution of the storage problem for some communities. Especially is this true if no way can be found by which wheat stored on farms can be more extensively used as collateral.

The present problem of financing farm storage of wheat is much more one of supply of funds than of interest rates. A saving to a farmer of 2 to 3 percent on $1,000 to $2,000, the average size wheat loan, will not justify him in abandoning existing farm storage facilities for local station storage at additional cost.

TYPES OF FARM STORAGE

An idea of the character of farm storage facilities included in this study can best be gained from thesample types shown in figure 6. The various kinds of storage facilities may be roughly classified under the following heads: (1) Temporary storage space; (2) farm granaries; (3) metal grain bins; (4) farm elevators; (5) cooperative community elevators.

In addition, wheat is stored for a time in the stack, usually from 60 to 90 days. The loss while in the stack averaged 1½ to 2 percent as estimated by the farmers reporting.

Temporary storage space is constructed in various ways. Portable bins of wood are built out of shiplap, staves, cribbing, and tongued and grooved lumber with and sometimes without a roof. Bent board roofs are frequently used.

A type of temporary storage easy to provide is shown in figure 6, A. Posts are set in a circle. Good strong woven wire of some kind is stretched around the posts, and then lined with ordinary window screen wire. A board bottom may be used, or if a well-drained spot is selected there is, as a rule, little loss on the ground, especially in the western part of the state. Tarpaulins may be used to cover the grain.

Permanent farm built granaries vary greatly in type and cost of construction. Figure 6, C is typical of an older and cheaper type of granary frequently constructed in the wheat field. Figure 6, B shows an old farm elevator that is now being used as a granary. The elevating machinery is out of order, and has not been used for years. The present owner plans to use the building as a farm elevator again as soon as he can get it remodeled. In many cases, especially in the eastern part of the state, grain bins are built in the barn. Figure 6, D is a spacious granary on a large western Kansas wheat farm, 20 or 25 miles from market. The roof and sides are covered with sheet iron and there is a driveway through the center. A shed horse barn is built on one side. Figure 6, F shows a well-built, weather-boarded granary on a concrete foundation. It has a shingle roof. Loading and unloading are done from the front and sides. This granary is approximately 9 by 40 feet and has a capacity of about 8,000 to 10,000 bushels. It was built in 1913 at a cost of about $750. Figure 6, G is a smaller weather-boarded granary with a hip-roof. It was built in 1919 at a cost of about $500. The granary has a concrete foundation and a driveway through the center. The capacity is about 3,000 bushels. Figure 6, H shows the most common type of metal grain bin. The capacity of those shown is, 1,000 bushels each and they were purchased in 1920 for $220 apiece. Grain bins of this type are quite numerous in the wheat belt. They are very frequently found on tenant farms where there is no adequate permanent storage. Some farmers reported having these bins wrecked by the wind when empty unless they were well anchored.

The farm elevator is finding a place on a number of farms in the wheat belt. It is adapted to this section and in many localities is increasing in favor. Figure 6, J shows a good type of farm elevator.

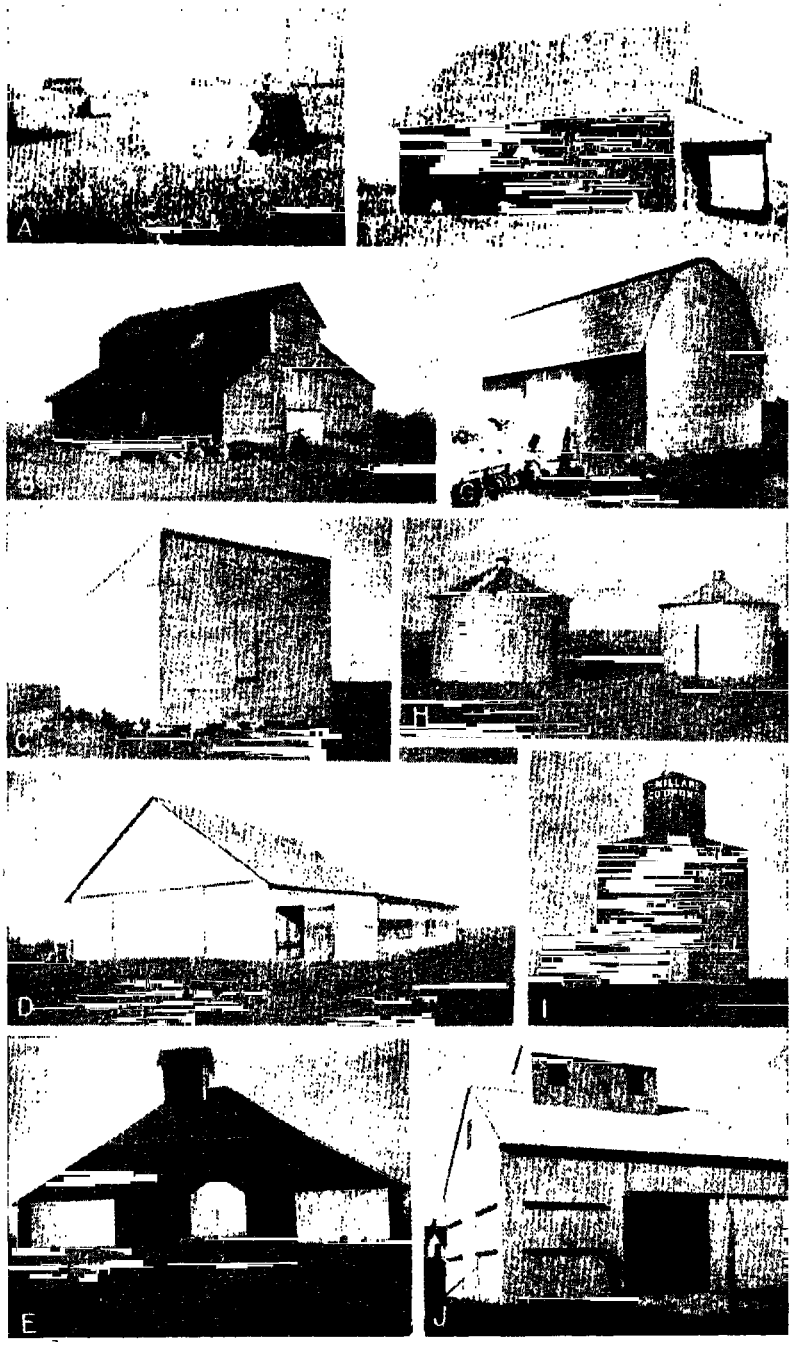

FIG. 6.—Some typical wheat granaries

It was built in 1914 at a cost of about $1,800, and has a capacity of about 7,000 bushels. It is equipped with a four-horse-power gasoline engine and elevating machinery. The engine cost $150 and the elevating machinery cost $270. This equipment will elevate about five wagon loads an hour. The owner was so situated in 1914 that he could either buy another 80 acres of land or build an elevator. He chose the elevator rather than the land, and thoroughly believes that such equipment pays the wheat farmer having on the average 3,000 to 6,000 bushels of wheat a year.

Figure 6, E is another type of farm elevator. It was completed in July, 1920, at an approximate cost of $9,000. It has bin room for 15,000 bushels in the elevator proper. The elevator faces south and there is shed room built on three sides, east, north, and west. Part of this shed room was boarded up and 5,000 or 6,000 bushels of wheat stored there in 1920. There was still shed room that could have been used. The pit on each side of the dump will hold 350 bushels. There are two loading bins holding 800 bushels each. The elevator is equipped with a six-horse-power gasoline engine and can elevate about 525 bushels per hour.

Figure 6, I is a new local cooperative elevator and probably should not be classed with farm elevators. It is typical, however, of what is being done in some communities in the way of local co-operative effort.

COST OF FARM STORAGE

While it was impossible to get accurate details on all the various items entering into the cost of farm storage, estimates were secured on major items, including interest on investment in granary or storage space, taxes, depreciation, insurance, labor used in binning and in loading out, loss of wheat in handling, and insurance on wheat in storage.

Data were secured from a number of farmers who had built or purchased granaries in 1919 and 1920. Good wheat storage space was built or purchased at that time for from 20 to 30 cents per bushel of capacity, the majority of space being secured at from 20 to 25 cents per bushel of capacity.

Farmers who reported building in 1914 and 1915 reported the cost at from 7 to 10 cents per bushel of capacity. This cost as well as the above does not include labor cost of construction. This work is often done by farmers themselves at odd times and no very satisfactory basis for arriving at such a cost could be found.

To make all records comparable and because labor costs for 1920

were used, all storage space was valued on a 1920 price basis, so that the cost of storage shown is entirely on a 1920 basis and is higher than actual cost to many farmers who were using buildings constructed years earlier at a much lower cost. Costs are presented in Table XIII for eastern, central, and western sections of the state. There is little variation in costs between the regions as a whole. Farmers have, in general, adapted the type and cost of storage space to the volume of their wheat business so well, that, though type and cost of storage facilities vary from section to section, the unit cost for wheat stored is very uniform.

TABLE XIII.—COST PER BUSHEL PER MONTH OF STORING KANSAS WHEAT IN FARM GRANARIES

(Average storage period, four months)

ITEMS	Sections of Kansas		
	Eastern	Central	Western
	Cents	*Cents*	*Cents*
Int. on building or storage space	0.68	0.52	0.55
Taxes on building or storage space	.09	.07	.08
Depreciation on bldg. or storage space	.33	.27	.28
Labor handling grain	.20	.15	.14
Loss of grain in handling	.11	.12	.08
Insurance on grain	.22	.22	.22
Insurance on building	.07	.05	.05
Cost per bushel per month	1.7	1.4	1.4

The slightly higher cost for the eastern section is due to the fact that storage space was not generally utilized as fully as in the other sections. There are, therefore, fewer bushels of grain to share overhead expenses in maintaining storage space.

With cost of storage space figured at 1913-14 prices instead of at 1920 prices, the cost of storing wheat on these farms would be reduced to approximately 1 cent a bushel a month, assuming an average storage period of four months as was done in Table XIII. This is approximately the same rate as has been charged by local elevators.

Interest on investment in buildings was figured at 6 percent, man labor at 35 cents an hour, and horse labor at 15 cents an hour. This means that the farmer can store his wheat on the farm and, allowing himself 6 percent on his investment, wages for his time, and other necessary expenses, can get storage at approximately local elevator rates.

□