NOVEMBER, 1927 BULLETIN 244

AGRICULTURAL EXPERIMENT STATION
KANSAS STATE AGRICULTURAL COLLEGE
Manhattan, Kansas

THE EFFECTS OF SHORTAGE OF FARM STORAGE SPACE AND INABILITY TO GET LOCAL BANK CREDIT ON THE MOVEMENT OF KANSAS WHEAT TO MARKET

PRINTED BY KANSAS STATE PRINTING PLANT
B.P. WALKER, STATE PRINTER
TOPEKA 1927
12-442

SUMMARY

There is good evidence that, with average production, not more than 3 to 4 per cent of the Kansas wheat crop is "forced" on to the market because of shortage of farm storage space.

Exceptional conditions in recent years have been due, in large part, to the great expansion of wheat acreage in the eastern and western thirds of the state during the late war, and more recently to the increased acreage in the west and southwest as a result of the more extensive use of the combine.

The extent to which wheat yields in different parts of the state fluctuate makes uneconomic and practically impossible any close adjustment between farm storage room and size of crop. Local surpluses under pressure, therefore, are likely to appear almost any year, but as pointed out they generally form a small part of the total movement.

While still further studies are being made of the "pressure" exerted by credit shortage, findings to date indicate that, as a rule, around 10 per cent of the wheat crop in Kansas is "forced" on to the market because of inability on the part of the farmer to get the desired local bank credit.

The combined influence of the two factors, (1) shortage of farm storage space and (2) inability to obtain local bank credit, seems to cause the marketing of a quantity of wheat equal to from one-half to two-thirds of the quantity ordinarily marketed in excess of mill and export requirements, and marketed largely in the first six months after harvest.

Shortage of bank credit, as it affects the movement of wheat to market, may result from either of two circumstances. The shortage may be the result of an actual shortage of currency or banking resources. Or, on the other hand, the shortage may be the result of lack of care and ability on the part of certain farmers in using credit, and the consequent necessity of banks denying such persons the credit they ask.

The influence of bank credit on grain movement, therefore, can be most effectively modified by employing corrective measures to both these sources of credit difficulty, and not to one alone.

The danger of losses through excessive moisture, weevil infestation, etc., under certain harvesting conditions, together with sudden advances in wheat prices, are other important factors contributing to heavy seasonal movements of Kansas wheat, and seem to account for one-third to one-half of the early movement of wheat to market.

TABLE OF CONTENTS

EFFECTS OF SHORTAGE OF FARM STORAGE SPACE AND INABILITY TO GET LOCAL BANK CREDIT ON THE MOVEMENT OF KANSAS WHEAT TO MARKET[1]

R. M. GREEN

SEASONAL PRICE SAGS

The effect of heavy marketing shortly after harvest, or in August and September, on the price of Kansas wheat can be determined only approximately, because many other price-making factors are at work at the same time rendering exact measurements impossible. In the case of better quality No. 2 hard winter wheat at Kansas City the difference in price is perhaps not more than 4 or 5 cents a bushel on the average. For the past 31 years the August price for this kind of wheat has averaged 4.6 cents a bushel under July; and the September price, 2.5 cents a bushel under August. August has averaged 4.3 cents a bushel under October; and September, 6.8 cents a bushel under October.

In the case of low quality No. 2 hard winter wheat at Kansas City, July and August prices have both averaged 3 cents a bushel under September and 3.5 cents a bushel under October.

Those who "pin all their faith" on orderly marketing overlook the fact that they are dealing with only one of the minor price-making influences in considering the movement of "cash grain" to market, and consequently overemphasize its importance.

Those who decry any mention of orderly marketing, on the other hand, would have it believed that no matter what. the receipts at the market, the price to the producer remains unaffected. As usual, the truth of the matter lies somewhere between these extreme argumentative viewpoints.

A mere observation of wheat prices on any market indicates that quite frequently there is a drop in prices during August and September. That some do this is attributable to heavy receipts is verified by the markets' own reports such as the following:

Another big day's receipts, making the record for the week 4,545 cars, maintained easy tone in carlot prices in the local market to-day. Quotations were 3 to 4 cents lower generally for hard wheat[2]

Acknowledgements.—The author desires to acknowledge the coöperation of the Food Research Institute of Stanford University (California), in 1922-'23; also the assistance of Mr. H. I. Richards in compiling parts of the data and of Dr. J. S. Davis of the Food Research Institute, in preparing parts of the manuscript.

1. Contribution No. 11 from the Department of Agricultural Economics
2. Grain *Market Review* Kansas City, Mo.: July 23, 1921.

Carlot arrivals of wheat here to-day were the smallest in weeks and served to impart a firmer tone to values.[3]

Rather moderate offerings and a good demand caused the local cash wheat market to act rather independently of futures to-day and there were advances of 1 to 2 cents in quotations.[4]

Weakness out of proportion to recessions in futures developed in prices for cash wheat as a result of excessive offerings.[5]

The contention that "orderly marketing," on the other hand, is a cure-all for all price weakness, even such as that shown in 1920, is as absurd as to assume that' supplies at the market do not affect prices.

If the farmer wants to convince himself that an even flow of wheat to market will not cure all his wheat-price troubles, he need but consider conditions at the Kansas City market in 1920. If he will study the receipts of wheat at Kansas City, Mo., for the year, July, 1920, to July, 1921, he will find an almost perfect, example of an even flow of wheat to market. In the first three months of the market year 26 per cent of the year's receipts was received; in the second three months, 23.7 per cent was received; in the third quarter of the year 25.7 per cent was received; and in the fourth quarter 24.6 per cent was received. In other words, during each quarter of the crop year, 1920 to 1921, approximately one-fourth of the year's receipts arrived at the market. This is as close a balance as it will ever be possible to maintain by artificial means. However, this was not the only price-making factor at work in the fall of 1920, and despite this very orderly marketing of wheat in Kansas City territory, wheat prices were not maintained.

On the other hand, if such orderly marketing is proposed for all markets it will be found that even now export supplies from the United States are dovetailed in with competitive supplies from other countries in quite an orderly manner, and supplies for home consumption are absorbed with but small fluctuations as a usual thing because of forward buying by terminal elevator interests and by dealers in futures. Only price fluctuations within the range of 2 to 5 cents, and not broader changes in the price level, can be attributed to present heavy seasonal marketings of cash grain.

---

3. *Grain Market Review,* Kansas City, Mo., August 8, 1922.
4. *Grain Market Review* Kansas City, Mo., January 12, 1922.
5. *Grain Market Review* Kansas City, Mo., September 5, 1923.

PURPOSE OF THE STUDY

The purpose of the study, the results of which are printed in this bulletin, was to find out, as far as possible, how much the two factors, (1) shortage of farm storage space and (2) inability to get local bank credit, are to blame for the "dumping" of Kansas wheat on to the market.

Such a study should aid in appraising the effectiveness of improvements along the line of increased supplies of storage space and added farm credit facilities, and indicate the extent to which these are likely to relieve the more or less periodic congestion in the primary movement of wheat to market.

Furthermore, the results of such a study may serve as a basis for judging the probable effect, for any particular year, that current credit conditions and the distribution of the crop in the state will have on the volume of wheat likely to be marketed early. Also, a knowledge of the distribution of a crop with reference to supply of farm bin room mill indicate the load that local elevators and the railroads may be called upon to carry.

It has been a matter of common knowledge that shortage of farm storage space and inability to get local bank credit have caused some early marketing of wheat. For how much of the movement they are responsible, whether there are other important, causes at work, and especially, the geographical distribution of their influence are points about which there has been little definite information.

SHORTAGE OF FARM STORAGE SPACE AND WHEAT MOVEMENTS

METHODS OF PROCEDURE IN MEASURING THE EFFECTS OF ANY FARM STORAGE SHORTAGE ON WHEAT MOVEMENT

The general method of study was to first secure certain basic data from which reasonable inferences could be drawn as to motives back of procedure of farmers in marketing. These inferences were then checked against replies to a direct question as to how many bushels of wheat were marketed under pressure from a certain factor named in the question. This method has the advantage of furnishing some check on any possible bias that might enter into replies to direct questions where the purposes of the answer sought is clearly revealed.

In getting at the problem of how much wheat is forced on to the market by shortage of farm storage space, three different measurements were used: (1) Bushels of wheat actually sold direct from the threshing machine, where the farmer stated he believed it paid to

hold wheat, but had less bin room than wheat; (2) excess of crop per county over bin room per county; (3) answers to the direct question of how many bushels of wheat were sold because of shortage of farm storage space.

The first measurement has the advantage of excluding the effects of voluntary shortage of storage space, where the farmer has little or no storage space simply because he is close to a local elevator station or for some reason believes it does not, pay to store on the farm.

This method is imperfect in that it may sometimes include wheat marketed because of a change of opinion as to the profitableness of storing induced by changes in market prices and may also include some wheat marketed where shortage of credit was a joint cause.

The second measurement has the advantage of taking into consideration all parts of the state and does not include wheat except that in excess of bin room. Its shortcoming is that, in making the county the unit, it disregards individual inequalities in distribution between crops and bin room on individual farms within the county. To the extent that it disregards these individual inequalities, it minimizes the effects of shortage of storage space. To the extent that it includes voluntary shortage of storage space, *i. e.*, shortage due to the fact that farmers are near local elevators or for some other reason believe it does not pay them to store on the farm, this second method exaggerates the volume of wheat "forced" on to the market.

The strength of the third type of measurement lies in the explicit reference to the particular wheat about which inquiry is made. Its weakness lies in possible personal bias and exaggeration when "forced selling" is suggested. Also, where a certain block of wheat is sold, as it sometimes is, for joint, reasons, the allocation to the cause "shortage of farm storage" is left to the varying judgments of different individuals.

Because of the simultaneous influence of the credit factor and other impelling motives, it is impossible, as in the case of much economic data, to segregate exactly the amount of wheat marketed because of shortage of storage space alone.

This cross-question method of approach from the three different angles, however, furnishes data of sufficient accuracy to serve any practical purpose.

To test the probable validity of the data secured from only a small per cent of all the farms in the state, the geographical distribution of farms reporting is shown in figure 1. In the tabular data following

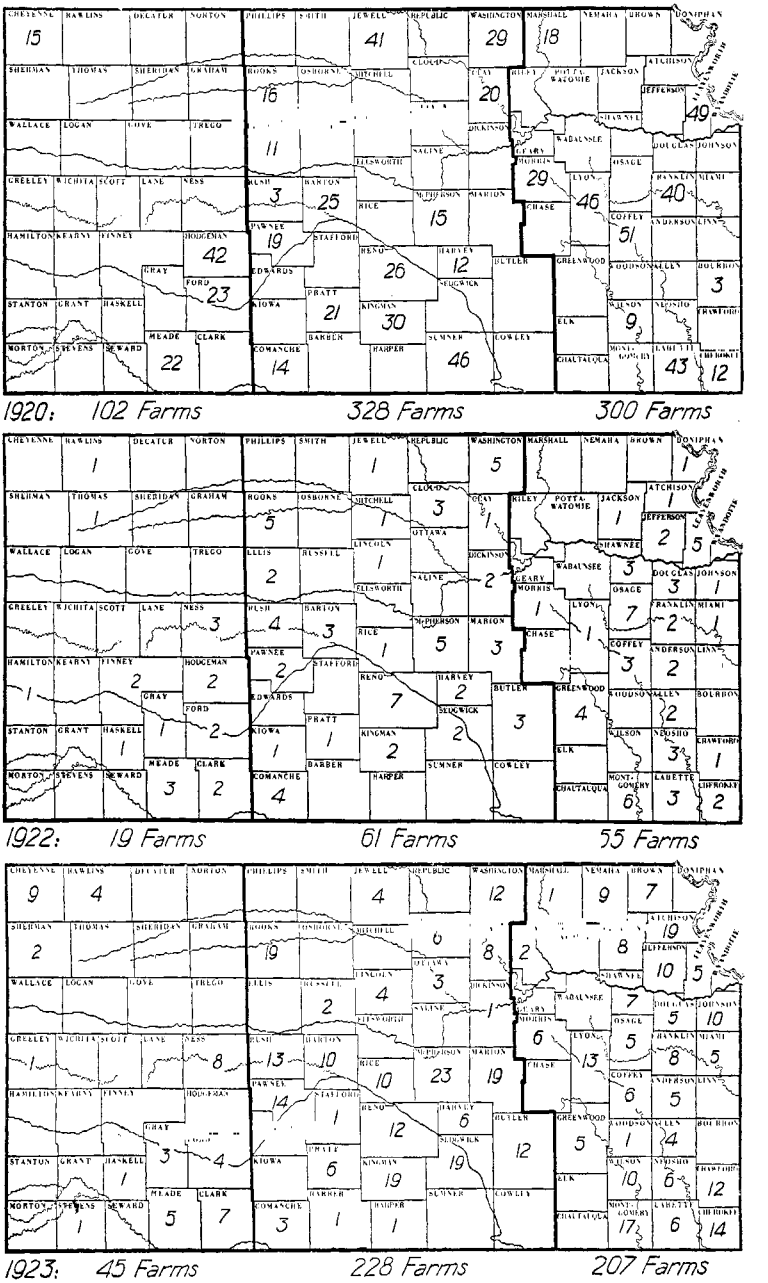


FIG. 1.—Maps of Kansas showing distribution of farms used in studies in 1920, 1922 and 1923.

figure 1, these figures are repeated and the distribution of all farms in each third of the state, as shown by the 1920 census, given for comparison.

The following tabulation gives a comparison of the distribution of farms shown in figure the distribution of all farms in each third of the state as by the census.

	PER CENT OF FARMS IN EACH THIRD OF THE STATE		
	Western.	Central.	Eastern.
Census of 1920, all farms.....	12.8	42.7	44.5
Farms in 1920 study—730.....	14.0	44.9	41.1
Farms in 1922 study—135.....			
Farms in study—480.....			

SUPPLY OF FARM STORAGE SPACE TAKING THE STATE AS A WHOLE

Kansas farms, on the whole, are well supplied with granary space for wheat. Any shortage of space results from abnormally high yields in a particular part of the state. As a group, Kansas wheat growers are carrying about a 50 per cent surplus of storage space on their farms in order to take care of fluctuations in crop yields, although there are individual farms short of storage space almost any year. (Table I.)

It is the local fluctuation in size of the crop from year to year that makes any perfect balance between granary space and size of wheat crop not only impractical but impossible. To provide enough storage space to prevent any shortage for all time, and in all places in the state, would result in a very costly surplus of space most years.

Shortage of farm storage space in Kansas, in general, has been confined very largely to the eastern and western thirds of the state — that is, to the border wheat regions of the state. It is in parts of these sections that the greatest proportional increases in wheat acreage took place during the late war. (Fig. 2) The eastern section is least adapted to producing wheat because of soil and climatic conditions. It is also in this section that the possibilities of making more profitable crop substitutions are found and that a reduction in wheat acreage has been taking place.

The most pressing shortage in farm storage space is in the west and southwest where the acreage of wheat has increased under the influence of reduced production costs made possible by a greater use of the combine harvester-thresher.

In Table I is summarized the farm storage supply situation for three years, as indicated by studies on typical farms and by a co-

operative study undertaken with the State Board of Agriculture. The data secured by the State Board of Agriculture for 1923 were obtained through the county assessors and cover the entire state. A question was added to the regular statistical schedule calling for the amount of bin room each farmer had for wheat-storage purposes.

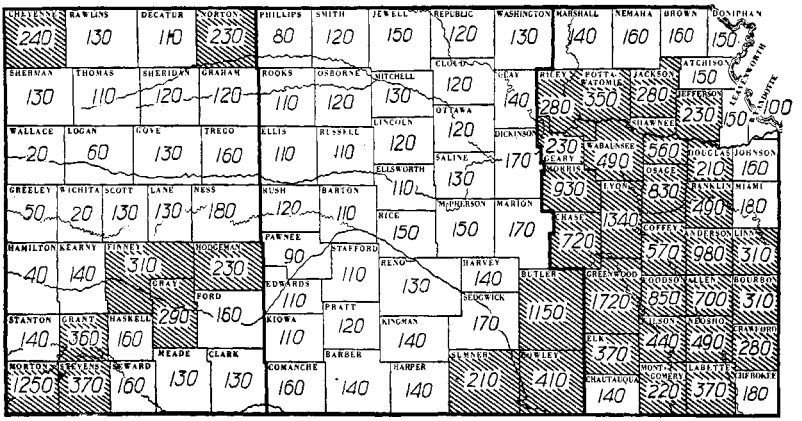


FIG. 2.—Kansas wheat acreage in 1920 in per cent of 1911 acreage. Shaded areas indicate heaviest proportional increases. (Data from State Board of Agriculture.)

TABLE I.—Supply of farm storage space in Kansas taking the state as a whole.

	1920.	1922.	1923.	State Board of Agriculture data.	
				1923(*a*).	Average, 1915-1922.
Number of bushels of bin room to each bushel of crop	1.44	1.46	1.91	2.12	(*b*)1.49
Number of bushels of bin room to each bushel of crop actually stored	1.77	1.84	2.93	.....	.....
Per cent of crop sold direct from threshing machine	17.2	20.5	34.8	.....	.....
Per cent of crop first going into farm storage	82.8	79.5	65.2	.....	.....
Per cent of farms short of storage space	19.9	19.7	14.7	.....	.....
Per cent of farms having no storage space	4.8	2.0	1.0	.....	.....
Size of Kansas wheat crop (bushels)	140,842,516	116,864,983	76,172,274	76,172,274	107,743,562
Number of farms included	743	152	325	.....	.....

(*a*) Total farm storage space for wheat in the state, 161,163,053 bushels.
(*b*) Average annual production for the eight-year period compared with bin room data for 1923.

PER CENT OF WHEAT CROP AFFECTED BY SHORTAGE OF FARM STORAGE SPACE AS MEASURED BY WHEAT SOLD DIRECT FROM THE MACHINE

Wheat sold direct from the machine and belonging to farmers who were short of storage space, but who believed it paid to store, constituted 3.5 to 5 per cent of the total crop of all reporting farmers. (Table II.) Here the inference is drawn that such wheat, in the main, is moved because of the shortage of storage space.

This measurement is likely to give a figure, if anything, a trifle high. In spite of the fact that there is a shortage of farm storage space, a part of this early marketed wheat may have been moved because of credit difficulties. In other words, both shortage of storage space and lack of credit may have been present, with the latter, however, the impelling motive.

TABLE II.—Per cent of wheat crop affected by shortage of farm storage space as measured by wheat sold direct from the machine, where the farmer believed it pays to store but had less bin room than crop.

YEAR.	Number of farmers reporting.	Farmers short of storage space, selling direct from machine, but believing it pays to store.		Per cent of reporting farmers' crop in excess of bin room.
		Number.	Per cent.	
1922	152	9	5.9	3.5
1923	325	24	7.4	5.1

That such is the case is indicated by the 1923 data. Out of 325 farmers replying to the questionnaire there were 24 who said they believed it would pay to hold wheat and, at the same time, had less bin room than wheat. They constituted 7.4 per cent of the total number of farmers reporting. (Table II.) These farmers were also asked if they sold any wheat before they wanted to because of shortage of storage space. Only 4.6 per cent of the total number reported doing so, indicating that part of the 24 farmers who marketed early, did so for other reasons than shortage of storage space, though as a matter of fact they were short of the necessary storage space.

While from 15 to 20 per cent of the farmers reporting actually had less bin room than crop, only 40 to 50 per cent of this shortage was involuntary or contrary to the wishes of the farmers. In the remainder of the cases the farmers would have sold their wheat anyway, believing it would not pay to store.

PER CENT OF WHEAT CROP AFFECTED BY SHORTAGE OF FARM STORAGE SPACE AS MEASURED BY A COUNTY-BY-COUNTY COMPARISON OF ANNUAL CROP WITH COUNTY BIN ROOM

It has already been noted that while in the state as a whole, there is a surplus of farm bin room, there are local shortages nearly every year. The total excess of county crops over county bin room, using the 1923 census of bin room in each instance, amounts to from 0.3 per cent of the state crop in 1917 and 1923 to 12.1 per cent of the crop in 1920. (Table III.) The average for the nine-year period, 1915 to 1923, is 5.8 per cent of the state crop. This indicates the part of the total state crop affected by local county shortages of farm bin room.

TABLE III.—Per cent of wheat crop affected by shortage of farm storage space as measured by a county-by-county comparison of annual crop with bin room.

YEAR.	Total Kansas crop (bushels).	Excess of crop over bin room for all counties having an excess (*a*).	
		Bushels.	Per cent of total crop.
1915	95,768,176	1,129,029	1.2
1916	99,384,760	4,280,823	4.3
1917	41,563,387	152,401	.3
1918	93,195,332	4,172,949	4.5
1919	146,109,192	12,908,208	8.8
1920	140,842,516	18,022,190	12.1
1921	128,220,148	7,790,864	6.1
1922	116,864,983	5,480,781	4.7
1923	76,172,274	239,101	.3
	938,120,768	54,176,346	5.8

(*a*) The excess of each county's crop over its bin room, where there was any excess, was first determined. The sum of these county surpluses gives the state total used in the comparison with the state crop. (All data are from the State Board of Agriculture. Bin-room figures are for 1923.)

Apparently the marketing pressure from shortage of farm storage was at its height in 1920, the year these studies were begun. There was much discussion of the matter at that time, and suggestions were numerous for increased storage space for wheat. An educational campaign to increase the supply of farm storage space, a system of large county elevators for storage purposes, and a system of state-owned elevators were among remedies suggested.

With a decrease in wheat acreage in eastern Kansas and improved car supply since 1920 the pressure from storage shortage

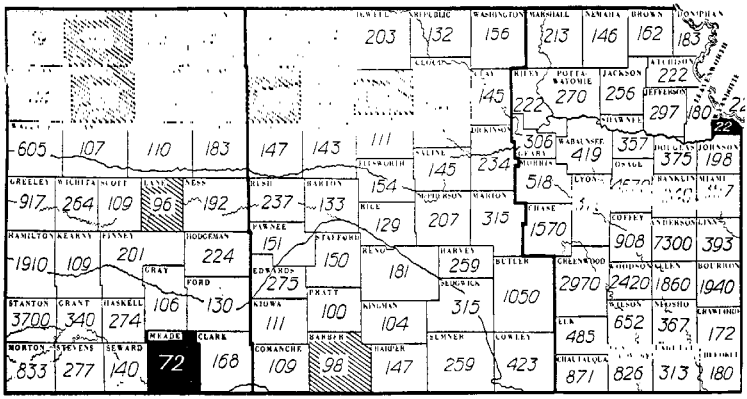
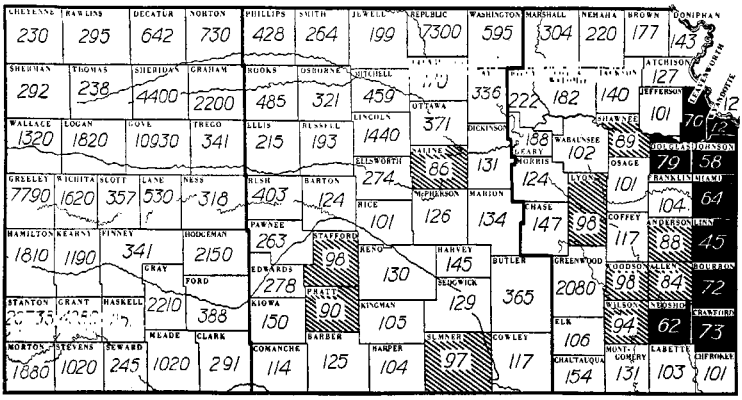
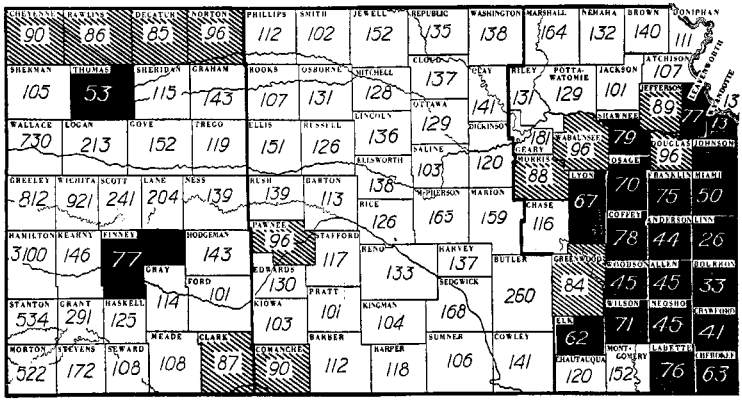


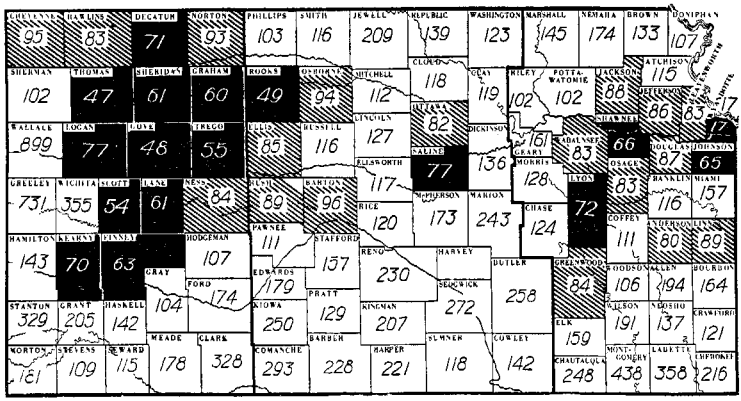
FIG. 3.—Maps of Kansas showing by counties farm bin room, expressed in bushels, for each 100 bushels of the 1915, 1916 and 1917 crops. Shaded areas are counties short of storage space. Black areas show unusual shortage.



1918



1919



1920

FIG. 4.—Maps of Kansas showing by counties farm bin room, expressed in bushels, for each 100 bushels of the 1918, 1919 and 1920 crops. Shaded areas are counties short of storage space. Black areas show unusual shortage.

has subsided, and appears to have already turned to prewar proportions, except in good crop years in the West and Southwest.

In noting the results presented in Table III attention is called to the fact that the crop for each year has been compared with the bin-room data obtained in 1923. Obviously this is not strictly fair to the earlier years. It tends to minimize the shortage in those years, since unquestionably there has been an increase in farm bin room between 1915 and 1923. For this reason the earlier figures are not as reliable as those for more recent years. It is believed, however, that the growth in volume of farm bin room has not been large enough to seriously affect data subsequent to 1915. Application of 1923 bin-room data to crop data prior to 1915 would of course be a questionable procedure.

Figures 3, 4 and 6 show county by county for each year from 1915 to 1923, inclusive, the average amount of farm bin room for wheat, for each 100 bushels of wheat, crop in the county. Figure 5 gives, for comparison, the result's of a special field survey of five counties made in 1920, showing, somewhat by inference, an area of the state that had marked shortage of wheat storage space that year.

For example, in 1915 (fig. 3), Harper county, near the center of the southern border of the state, contains the number 147. This

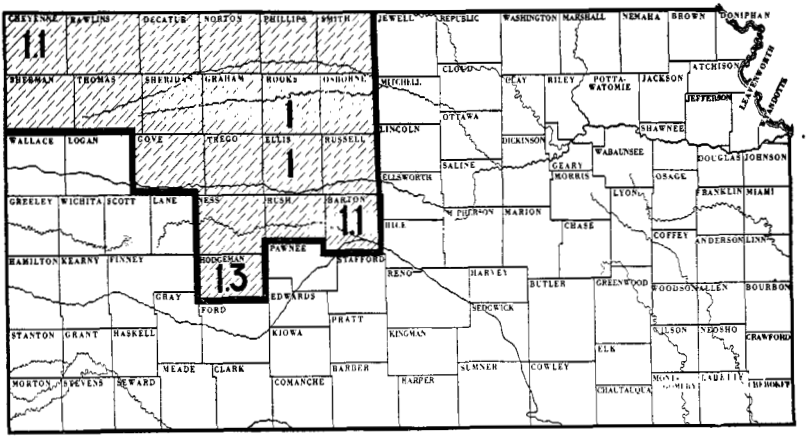


FIG. 5.—Map of Kansas showing approximate area that had marked shortage of wheat storage space on individual farms in 1920 as indicated by a survey of five typical counties. Numbers indicate, as an average for each of the five counties, the bushels of storage space for each bushel of the 1920 wheat crop. Compare with figure 4, year 1920.

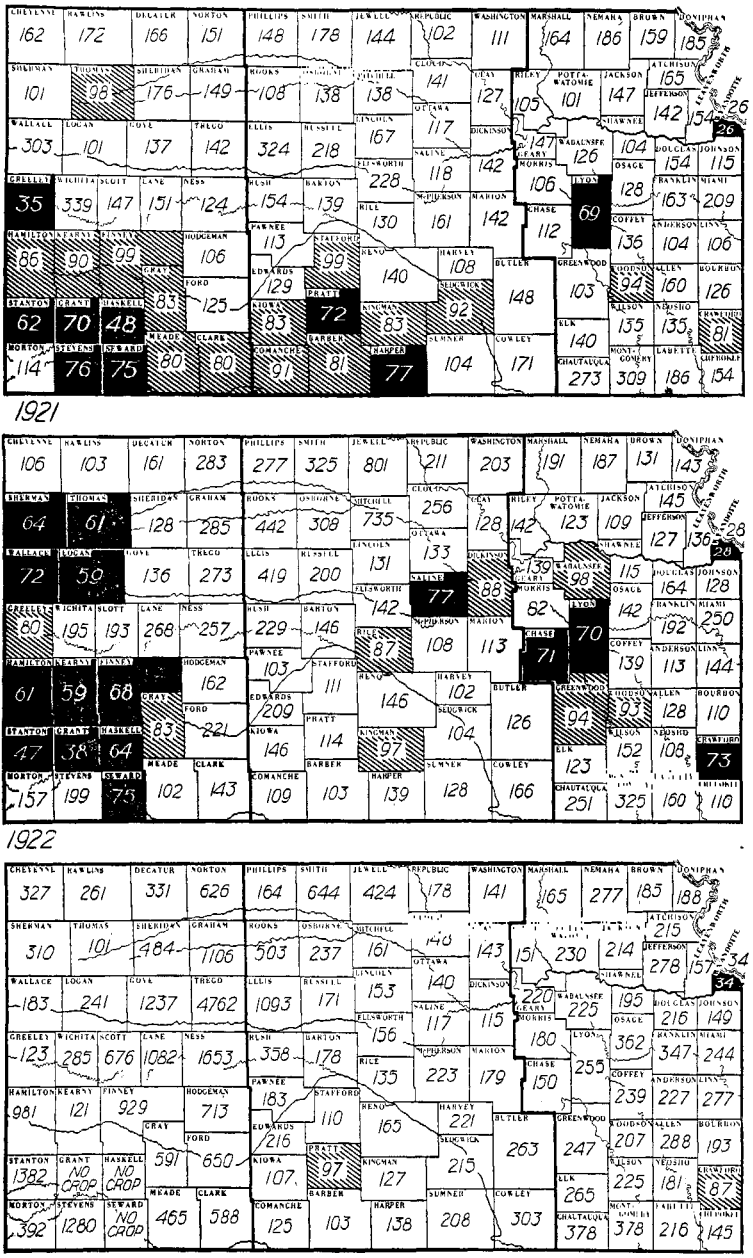


FIG. 6.—Maps of Kansas showing by counties farm bin room, expressed in bushels, for each 100 bushels of the 1921, 1922 and 1923 crops. Shaded areas are counties short of storage space. Black areas show unusual shortage.

means that the county of Harper as a whole had 147 bushels of bin room for every 100 bushels of wheat raised in 1915. On the whole there was no shortage of farm storage space in this county, although some individual farms here and there in the county may have been short,

Shaded counties indicate those short of bin room, that is, with less than 100 bushels of bin room for each 100 bushels of crop. Counties with less than 80 per cent as much bin room as crop are marked as showing unusual shortage. As a rule, around 20 per cent of the wheat crop goes to market direct from the machine without going into farm storage. Unless the bin deficiency, therefore, averages more than 20 per cent it is not considered unusual.

These maps indicate better than tables the extent to which the influence of the farm-storage shortage factor in marketing is shifted geographically from year to year, and they also indicate the varying degree of its importance.

It will also be noted on these maps, as suggested earlier, that much of the trouble from farm storage shortage in recent years has been in the eastern and western thirds of the state. Conditions in the West and Southwest have been aggravated between 1923 and 1927 by an increase in acreage accompanying the more extensive use of the combine harvester-thresher in that territory. Relief in the East has come about partly from the reduction in acreage and partly from better car supply.

PER CENT OF WHEAT CROP AFFECTED BY SHORTAGE OF FARM STORAGE SPACE AS MEASURED BY FARMERS' REPLIES TO THE QUESTION: "HOW MANY BUSHELS OF WHEAT DID YOU SELL BEFORE YOU OTHERWISE WOULD HAVE SOLD BECAUSE OF SHORTAGE OF STORAGE SPACE?"

Data for only one year, 1923, were obtained by use of the direct-question method. Replies from 465 farmers indicate that 2.6 per cent of the total crop of these 465 farmers was moved to market earlier than it otherwise would have been, because the owners were short of farm storage space. (Table IV.) This figure is comparable to the 5.1 per cent for 1923 by the first method of measurement used (Table II) and to the 0.3 per cent for 1923, where the whole crop of the state is considered (Table III).

A study of data for 1923 indicates that credit shortage played more than the usual role in early marketing. Attention should also be called to the fact that a small portion of the replies upon which the 2.6 per cent of the crop was based named both shortage of storage space and credit shortage as reasons for their selling a

certain volume of wheat. Because of the small total crop in the state in 1923, the smaller figures are believed to more nearly represent the state-wide situation,

TABLE IV.—Per cent of wheat crop affected by shortage of farm storage space as measured by farmers' replies to the question: "How many bushels of wheat did you sell before you otherwise would have sold, because of shortage of storage space?" (1923 data.)

NATURE OF REPLIES.	Number of farmers reporting.	Per cent of total.	Number of bushe's represented.	Crop short of storage space.	
				Bushels.	Per cent of total.
Not short of storage space.....	353	75.9	391,183	0	0
Short of storage space.....	17	3.7	25,170	12,040	47.9
Not reporting any shortage of storage space (a).....	95	20.4	46,054	0	0
	465	100.0	462,857	12,040	2.6

(a) Because of small crops and no definite report of shortage of storage space, it was assumed there was no shortage.

SHORTAGE OF CREDIT AND WHEAT MOVEMENTS

The effect of credit shortage on "forced" movement of wheat to market is even more difficult to measure than the effect of storage shortage. However, the methods employed have, to date, furnished fairly consistent results.

METHODS OF PROCEDURE IN MEASURING THE EFFECTS OF ANY SHORTAGE OF LOCAL BASK CREDIT ON WHEAT MOVEMENT

At first attention was centered mainly upon determining what proportion of Kansas farmers were unable to get all the loans they applied for. Data bearing on this point were obtained for two years from farmers, and for one year from bankers. While there was considerable variation in conditions from place to place in the state, averages for the state as a whole were reasonably consistent from year to year.

In 1921, according to farmers' replies, 19.3 per cent of them failed to obtain all loans applied for. In 1922, according to farmers, 17.9 per cent applied for loans which they did not get. For the same year, 1922, according to bankers' replies, 17.1 per cent of farmers applying for loans were turned down.

It is obvious from these results that the wheat sales of not more than 18 or 19 per cent of the farmers are likely to be under pressure from shortage of bank credit. Individual instances reported

indicate that it is not likely that all the wheat of this per cent of farmers was sold because of inability to get loans applied for.

Two assumptions based merely on personal observations were made in order to estimate roughly, from the above findings, the amount of wheat likely to be affected by credit shortage.

The first assumption was that it would be those farmers who were denied credit and who were seeking loans to pay off debts who would likely contribute most to the supply of wheat "forced" on to the market. It was then an easy matter to determine what per cent of the total number of farmers constitutes this group.

The second assumption was that, on the average, about half of the wheat crop of farmers having credit difficulties would be sold to raise the necessary money. (Further studies have indicated around 60 per cent as more nearly correct. Table IX.) This, roughly, would be equivalent to the wheat crop of half the farmers having credit difficulties.

The first studies on number and proportion of farmers unable to get credit and such inferences as the above drawn from them, merely furnished the basis for an estimate to be used as a check on further measurements.

A second method of measurement was to determine the amount of wheat sold direct from the threshing machine, where the farmer believed it paid to store his wheat and where he had bin room in excess of his crop. It was reckoned that wheat marketed direct from the machine (contrary to what would be suggested by the two conditions, (1) a belief in the profitableness of storing and (2) ample farm storage space) was wheat largely under pressure from shortage of bank credit.

The third method of measurement was that of a direct question to farmers as to how much wheat they had sold before they otherwise would have sold, because of inability to get bank credit.

PER CENT OF WHEAT CROP AFFECTED BY CREDIT SHORTAGE AS MEASURED BY THE PROPORTIOX OF FARMERS USABLE TO OBTAIN ALL LOANS APPLIED FOR

A study of conditions among Kansas farmers, in 1921 and 1922, indicates that from 15 to 20 per cent of the farmers were failing to get all loans applied for. Some of these already had money borrowed but were refused additional loans or extensions. Part of them had no loans and were unable to make any.

In 1921, 580 farmers and in 1922, 336 farmers replied to questions asking for the number, amount, and purpose of loans applied for

and not obtained; also the number, amount, and purpose of loans already secured, if any. A summary of these data showed, as pointed out before (p. 19), that in 1921, 19.3 per cent of the farmers reporting were unable to get all loans applied for. In 1922, 17.9 per cent reported being turned down on one or more applications for loans. (Table V.)

TABLE V.—Per cent of Kansas farmers unable to obtain all loans applied for in 1921 and 1922.

(Data from farmers' replies)

YEAR.	Number of replies.	Farmers having no loans, and unable to obtain any.		Farmers having some loans but denied additional credit.		Total per cent having credit difficulties.
		Number.	Per cent.	Number.	Per cent.	
1921.....	580	49	8.4	63	10.9	19.3
1922.....	336	17	5.0	43	12.9	17.9

In 1922 a similar inquiry in a little different form was addressed to the bankers of the state. In this instance, replies were in terms of per cent of the banks' farmer customers who were denied loans. These data, therefore, are unweighted as to number of farmers patronizing each bank and are simply on a per bank basis. Because of the distribution of replies, however, both geographically and according to size of banks, it is believed these data are a valuable check on farmers' replies. An arithmetical average of per cents reported shows 17.1 per cent of the farmers unable to obtain all loans applied for. (Table VI.) This is comparable to the 17.9 per cent reported by farmers.

In addition to asking bankers what proportion of farmers' applications for loans they had found it necessary to turn down, they were

TABLE VI.—Per cent of Kansas farmers unable to obtain all loans applied for in 1922.

(Data from bankers' replies)

YEAR.	Number of replies.	Per cent of farmers unable to obtain all loans applied for. (Arithmetical average of per cent reported.)	Per cent of total replies ranging from 5 to 25 per cent.	Modal number.	Median.
				Per cent.	*Per cent.*
1922.....	45	17.14	78.6	10	10

asked whether they insisted on any of their borrowers liquidating loans as soon as crops mere harvested. Out of 565 replying to this question, 341 or 60.4 per cent, replied "yes"; 149 replied unqualifiedly "no"; and 75 ''no" with such qualifications as "it depends upon the man," "no, unless already carrying heavy loans," etc. However, replies to the additional question of what per cent of farmer customers such demands were made of, indicate that less than a fourth of the farmers were affected by this policy.

TABLE VII.—Per cent of Kansas farmers forced to liquidate loans at the time crops were harvested in 1922.

(Data from bankers' replies)

YEAR.	Number of replies.	Per cent of farmers required to liquidate loans at harvest time. (Arithmetical average of per cent reported.)	Per cent of total replies ranging from 5 to 25 per cent.	Modal number.	Median.
				Per cent.	*Per cent.*
1922.....	316	24.18	66.4	10	20

Both farmers' replies to their individual situation and bankers' estimates of the situation among their customers seem to show that around 20 per cent of the farmers were having credit difficulties.

Out of 580 farmers replying in 1921, 50 or 8.6 per cent were attempting to borrow to pay existing debts, and at the same time were unable to obtain loans. In 1923, 33 out of 336 farmers or 10 per cent were in the same position.

Assuming for the time being, therefore, either (1) that this group of hardest-pressed debtors furnishes most of the wheat actually "forced" on to the market or (2) that about half of the wheat of farmers having credit difficulties will be forced on to the market, it appears that the movement of around 10 per cent of the wheat crop may be affected by credit difficulties.

As already noted, these data are merely suggestive. They deal with per cents of farmers and not with bushels of wheat. They only serve as a basis for drawing reasonable inferences as to the possible extent of the influence from credit shortage. Other measurements are needed to support the testimony offered by these first data.

PER CENT OF WHEAT CROP AFFECTED BY CREDIT SHORTAGE AS MEASURED BY WHEAT SOLD DIRECT FROM THE MACHINE

A certain group of farmers believed it paid to store their wheat on the farm and at the same time had ample bin room in which to store their whole crop. Nevertheless, they sold a portion of their wheat direct from the machine. Realizing, of course, that there would be individual exceptions, it was believed that, in the main, this wheat represented wheat being marketed because of difficulties in obtaining credit.

Using this type of measurement it was found in 1922 that 5.1 per cent of the crop of reporting farmers was affected by shortage of credit. In 1923, the same method—employed on a larger number of farms, however—showed 12.1 per cent of the crop of reporting farmers affected by credit shortage. (Table VIII.) An average for the two years shows 9.6 per cent of the crop affected by credit shortage and 16.7 per cent of the farmers so affected. This 16.7 per cent is comparable to the 19.3 per cent reported directly by farmers in 1921, 17.9 per cent reported in 1922, and with an average of 17.1 per cent reported by bankers in 1922.

TABLE VIII.—Per cent of wheat crop affected by credit shortage as measured by wheat sold direct from the machine where the farmers believe it pays to store and have more bin room than crop.

YEAR.	Number of replies.	Farmers selling direct from machine, but believing it pays to store and having plenty of storage room.		Per cent of total crop involved.
		Number.	Per cent.	
1922	152	10	6.6	5.1
1923	325	70	21.5	12.1
	477	80	16.7	9.6

Unquestionably, the smaller number of farms in 1922 makes the data for that year less conclusive.

PER CENT OF WHEAT CROP AFFECTED BY CREDIT SHORTAGE AS MEASURED BY FARMERS' REPLIES DIRECTLY TO A QUESTION AS TO THE PROPORTION OF THEIR CROP SOLD BECAUSE OF CREDIT SHORTAGE

In 1922 and 1923 a direct question was put to a number of farmers asking, "How many bushels of wheat did you sell, before you otherwise would have sold, because you were unable to get local bank credit?"

A summary of replies to this question shows that in 1922, 10.3 per

cent of the reported crop was sold before it otherwise would have been, because of inability to get local bank credit. In 1923, similar data show that 12.5 per cent of the reported crop was sold for this same reason. (Table IX.) These data also show that 14 per cent of the farmers in 1922 and 16.1 per cent in 1923 actually sold some of their wheat because of credit shortage. These figures compare, to a certain extent, with the per cents of farmers reported to be unable to obtain all loans applied for. The latter figures, according to farmers' replies, were 19.3 per cent in 1921 and 17.9 per cent in 1922. According to bankers' replies in 1922, 17.1 per cent of the farmers were refused loans.

These data also show that, in the case of the 14 or 15 per cent of the farmers that had credit difficulties affecting the marketing of their wheat, only 59.1 per cent of their crop was actually sold because of such difficulty in 1922, and 58.4 per cent in 1923.

TABLE IX.—Data on the per cent of wheat crop affected by credit shortage as measured by farmers' replies to a question as to the proportion of their crop sold because of credit shortage.

NATURE OF REPLIES.	Number of farmers reporting.	Per cent of total.	Number of bushels represented.	Crop sold because of credit needs.	
				Bushels.	Per cent of total.
1922 Data.					
No wheat sold because of credit shortage,	216	86.0	298,272	0	0
Wheat sold because of inability to get credit	35	14.0	63,141	37,342	59.1
Total	251	100.0	361,413	37,342	10.3
1923 Data.					
Definitely replied none sold because of credit shortage	372	83.9	401,272	0	0
Sold because of inability to get credit	71	16.1	109,591	63,977	58.4
Total	443	100.0	510,863	63,977	12.5
1924 Data (*a*)					
Definitely replied none sold because of credit shortage	535	83.2	1,310,786	0	0
Sold because of inability to get credit	108	16.8	323,824	180,481	55.4
Total	643	100.0	1,634,610	180,481	11.0

(*a*) In 1924 the data were secured through an independent investigation by the Kansas State Board of Agriculture. An entirely different mailing list from that used in securing the 1922 and 1923 data was used.

THE INFLUENCE OF SHORTAGE OF FARM STORAGE SPACE AND LOCAL BANK CREDIT ON THE MARKETING OF WHEAT

A preliminary survey of methods of marketing wheat, in Kansas pointed out as early as 1915 that the two factors, farm storage and farm credit, are important ones in regulating the length of the period during which the bulk of the wheat crop of the state is marketed. The annual report of the director of the Kansas Agricultural Experiment Station, under date of June 30, 1915, referred to the matter by saying: "Storage methods on the farm and farm credit, are the two factors which regulate the lengthening of the marketing period." [6] This report, had previously stated: "It has been concluded that the farmer could doubtless secure a greater profit from his wheat operations if he would (1) produce a better product, without, at the same time increasing the cost prohibitively; (2) lengthen the marketing *period,* or (3) secure full competitive market price at the local market."

No attempt was made in these earlier studies, nor has an attempt generally been made in other studies of this kind, to first appraise the effect, of lengthening the marketing period on price and then determine quantitatively the degree to which shortage of farm storage and credit do actually regulate the length of this period. It is believed that the present study furnishes some basis for such an appraisal of the several factors involved in the initial movement of wheat to market.

First with regard to the probable influence of a short marketing period on price: The present short marketing period due to farmers rushing their wheat to market soon after harvest, most generally affects price to the extent' of 4 to 5 cents a bushel, depending on the state of the wheat market, in general. This is indicated by a study of more than 30 years of hard winter wheat prices at Kansas City, Mo. In periods when the whole wheat market of the world is under selling pressure and supplies are liberal compared with demand, any particular market will be more sensitive to heavy seasonal receipts. This will be reflected in a bigger drop in price than usual. On the other hand, when the general wheat market situation is strong, advancing prices may lead out large supplies without any weakening in prices. In the latter instance market supplies come under the influence of price rather than price under the influence of market supplies, and seasonal heavy marketing may have little or no effect.

6. Director's Report, Kansas Agricultural Experiment Station, 1914-'15. P. 25, "Methods of Marketing Wheat."

A depressing influence within usual limits of 4 or 5 cents a bushel does not account for the broader changes in price level such as that following 1920 and such as so often involve the farmer in his severest financial difficulties.

Having noticed the probable effect of a shortened marketing period on the price of the farmer's wheat, the next question to be answered is how large is the volume of wheat producing this effect? In other words, how much of the wheat marketed during the short period of six months is "surplus" or "excess"?

This is perhaps the most difficult of the several factors to measure. Two methods, however, have been employed to date in the studies now being made in Kansas. One of these has been outlined briefly in a previous report on this study.[7] By this method the rate of marketing wheat by farmers is compared with the rate of mill and export consumption. The excess of farm deliveries over the current mill and export consumption indicates the "surplus" or "excess" marketed by farmers. Applying this method to the six crop years, 1914-'15 to 1919-'20 inclusive, the surplus or excess marketings by Kansas farmers was found to be approximately 20.4 per cent of the amount mills and exporters consumed. Therefore, twenty per cent of the crop consumed was put on the market before it was needed by either mills or exporters. This method will give a per cent too low, if anything, as the movement of supplies was gauged by receipts at Kansas City. These receipts lag behind actual deliveries in the country for the first two months.

A second method, giving only approximately correct results, is to divide the bushels exported and consumed in domestic commerce into the supplies at points of large accumulations plus those in country mills and elevators as reported on March 1. This is about two months later than the usual period of maximum accumulations and will consequently give a per cent that is low. For the 11-year period, 1910, to 1920, inclusive. this method shows the accumulations March 1 equal to 22.1 per cent of domestic and foreign consumption. For the six year period, 1914 to 1919, inclusive, the per cent is 21.2. This latter figure is for the same period as that used in applying the first method referred to above. It is therefore comparable to the 20.4 per cent obtained by the first method.

There seems to be good evidence that on the average around 20 per cent or more of the wheat crop marketed is "surplus" or "excess"

7. Bulletin 229, Kansas Agricultural Experiment Station, "Farm Storage as a Factor in the Marketing of Kansas Wheat," pp. 14, 15, 17.

above the current consumption by mills and exporters. In certain years the percentage is much higher. Furthermore, the methods here used are likely to give an average too low, rather than too high. These determinations, however, give a fairly good basis for appraising the importance of farm storage and credit as factors in shortening the marketing period for wheat and for judging to what extent, therefore, they contribute to the so-called "dumping" of wheat on to the market.

A study of the data presented in this report seems to indicate quite clearly that on the average not more than 3 to 4 per cent of the Kansas wheat crop is forced on the market because of shortage of farm storage space. This situation has been aggravated somewhat between 1923 and 1927, as previously noted.

Three years' data seem to indicate, with but slight, variation in the state average, that approximately 10 to 12 per cent of the Kansas wheat crop is forced on to the market because farmers are unable to get the desired local bank credit.

A study of the detailed reports submitted by farmers indicates that there is some duplication in the 3 to 4 per cent and the 10 to 12 per cent as here calculated because of the fact that certain lots of wheat were marketed for both reasons. The sum of these per cents, therefore, would represent maximum joint influence and would be too large rather than too small. Accordingly, it seems safe to say that 15 to 16 per cent of the wheat crop that is marketed is forced on to the market before it is needed because of shortage of farm storage space and inability to get local bank credit. These two factors, therefore, account for from one-half to two-thirds of the wheat marketed ahead of the requirements of mills and exporters. Lack of credit is by far the more important of the two causes. This shortage of credit may be due to a scarcity of loanable funds or to the credit standing of the farmers. The latter is the more frequent cause.

The farmers denied credit because of their standing at the bank at the time might be roughly grouped into two classes. There is the group that never gets loans of more than $50 to $100 because its members have consistently shown poor ability as managers. On the whole, they are business failures, sometimes through sickness and mishaps and sometimes because of their own bad management. Little or nothing can be done to extend further credit to this class.

There is a second class in which there are good farmers who have

borrowed, gone in debt and for the time being have liabilities in excess of assets, but if given the proper chance will again become financially solvent. It is this class in particular that can be helped by not forcing payments at the very earliest possible date irrespective of the consequences on the farmer's income. Intelligent cooperation between the banker and this class of farmers in taking advantage of business opportunities will react to the advantage of both in the end.

Inability to get local bank credit and shortage of farm storage space, however, are not the only important factors in causing the early marketing of wheat. From one-third to a half of the excess marketing apparently comes from other causes. Not an unimportant one of these other causes is the farmer's limited information on what is going on in his markets. This leads him to market more or less blindly and chiefly in response to nearby price movements.

To lengthen the marketing period for wheat and thereby remove one of the causes contributing to seasonal depressions in price, attention must be given to other factors in addition to farm storage space and credit facilities.

With total farm storage space in the state already 50 per cent above average crop requirements, and with the large fluctuations in wheat yields, in all parts of the state, it is doubtful if any more can be done economically in this direction to alter materially early crop movement, except in limited areas.

Something can be done through closer cooperation of country banks with certain classes of their farmer customers who need the better business guidance that a country bank should be in position to offer. Especially is this the case in the main wheat belt of the state.

Other factors than the two here studied need to be looked into with equal care to determine possible methods of procedure in modifying their influence on early crop movement.