SOME FACTORS LEADING TO DISPROPORTIONATELY LARGE SUPPLIES OF HARD RED WINTER WHEAT IN THE GREAT PLAINS

by

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INTRODUCTION

As is generally recognized, an excessive wheat carryover has developed in the United States during the past decade. Hard red winter wheat, such as grown throughout the Southern and Central Great Plains, has accumulated in Commodity Credit Corporation stocks at an alarming rate and it now comprises the bulk of the total wheat supply.

Many programs and ideas have been advanced to solve the problem of domestic wheat abundance, yet huge carryover stocks remain acutely evident--particularly through the Great Plains. The hard winter wheat supplies have been so large as to prompt some economists and legislators to advocate a general restriction of wheat production on the Great Plains.

The purpose of this paper is to determine the factors which have led to the huge wheat carryover and, more specifically, to analyze the major factors behind the proportionately greater increase in hard red winter wheat carryover. It might easily be inferred from the large stocks of hard winter wheat that this particular class has only limited use, therefore, it is channeled into storage. Is this wheat actually useless or even nearly so? Or have certain factors caused hard winter wheat to be priced out of portions of the domestic and export markets? To answer such questions is an objective of this

paper.

It is the hypothesis of this paper that the existing marketing and pricing system has resulted in a concentration of surplus wheat in the class, hard red winter. It is contended that all producers do not now have equal opportunity to dispose of their wheat through the market. To illustrate this contention the effects of five major factors on hard winter wheat marketing shall be studied.

The factors considered are (1) increased production of hard winter wheat in the Central Plains, (2) wheat transportation structure, (3) price support programs, (4) export subsidy program, and (5) new wheat milling techniques. These factors will be considered as they affect the movement of hard winter wheat to both domestic and export markets. However, primary emphasis will be given to effects on movement to export markets because the future expansion of wheat sales seems to lie in foreign markets.

As will be discussed in a subsequent chapter, domestic food use of wheat has remained for the past fifty years at around 500 million bushels and total domestic utilization involves about 600 million bushels. Exports, meanwhile, have been quite irregular but have gradually trended upward. For the past two years exports have exceeded total domestic disappearance.

In view of the potential overseas market, it is important that wheats of desired quality reach export points at

competitive prices. For only then can the United States gain its full share of future world markets. Therefore, the knowledge of how the factors discussed in this paper affect the ability of U. S. wheat to reach world markets should be of interest to market promotion workers, national policymakers, and wheat producers.

CHAPTER I

ANALYSIS OF WHEAT PRODUCTION AND CARRYOVER

Trends in Domestic Production and Carryover of Wheat

Wheat production in the United States has trended upward since 1920, with some periods of relatively sharp expansion and with other periods of contracted production.

> Compared with the 1920-29 period, average wheat production during the 1930's was down 16 per cent, while the 1940-49 average was up 29 per cent and the average for the 1950's was 33 per cent higher. Output has been quite erratic since 1947, largely because of drought periods in various sections of the Great Plains. However, the experience of recent years indicates that the trend is still rising.[1]

Overproduction has been a recurring problem for the wheat industry for nearly thirty years, and it has been a continuous problem for over a decade. Overproduction has led to the development of costly carryover stocks which have become increasingly unpopular with Congress and the United States taxpayers in general. But before discussing the size and composition of carryover stocks a more specific outline of production trends may be helpful.

Wheat production for any given year is directly

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[1] T. W. Manning and R. J. Doll, The Wheat Adjustment Problem (Federal Reserve Bank of Kansas City, November, 1961), p. 30.

dependent upon two variables, wheat acreage and yield. The number of acres depend primarily on government allotments and to a lesser extent on weather. Table 1 shows the past trend in seeded acreages, total production, and average yields.

TABLE 1

ACRES SEEDED, YIELD, AND PRODUCTION (1946-1963)[a]

Year	Acres Seeded (in millions)	Yield Per Seeded Acre (bushels)	Production (in billion bushels)
1946	71.6	16.1	1.15
1947	78.3	17.4	1.36
1948	78.3	16.5	1.29
1949	83.9	13.1	1.10
1950	71.3	14.3	1.02
1951	78.5	12.6	.99
1952	78.6	16.6	1.31
1953	78.9	14.9	1.17
1954	62.5	15.7	.98
1955	58.2	16.1	.94
1956	60.7	16.6	1.01
1957	49.8	19.2	.96
1958	56.0	26.0	1.46
1959	56.8	19.7	1.12
1960	54.9	24.7	1.36
1961[b]	55.6	22.2	1.23
1962[b]	49.1	22.2	1.23
1963[c]	53.2	22.0	1.17

[a] The Wheat Situation in the United States (Kansas City, Missouri, CED Associates Center, April, 1962), p. 9.
Wheat Situation, ERS, USDA (April, 1963), Table 10, p. 26.

[b] Preliminary

[c] April 1 estimate of production.

As is pointed out in Table 1, seeded acreage has been decreasing while total production has oscillated around the

one billion bushels mark each year. This would indicate that there has been a significant increase in per acre yield. For the 1935-39 period, the average seeded acreage and production were 73.2 million acres and 759 million bushels.[2] The average yield for this same period is calculated at 10.4 bushels per acre. In the same manner, the average yield for the 1963 preliminary crop estimate was 22.0 bushels per acre, more than double the previous figure.

Table 1 shows that yields increased sharply from 1956 to 1958 when they reached a high of 26 bushels per acre. Since that time yields have continued at high levels and have resulted in large crops. This is pointed out in Fig. 1 which employs the 1947-49 period as a base.

The trend toward increased yields has largely offset the total production effects of acreage restrictions. Yields are certainly influenced by environmental conditions, but they also seem to be inversely correlated with the number of acres seeded. This is partly because of the substitution of capital for land which has occurred as acreage is reduced. Also the long period of acreage reduction has taken place alongside technological advances in the wheat industry. New and improved wheat varieties which are more resistant to drouth, disease, and lodging have been developed. The use of fertilizer, irrigation, and generally improved management

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[2] Wheat Situation, Economic Research Service, USDA (No. 178, April, 1962), p. 20.

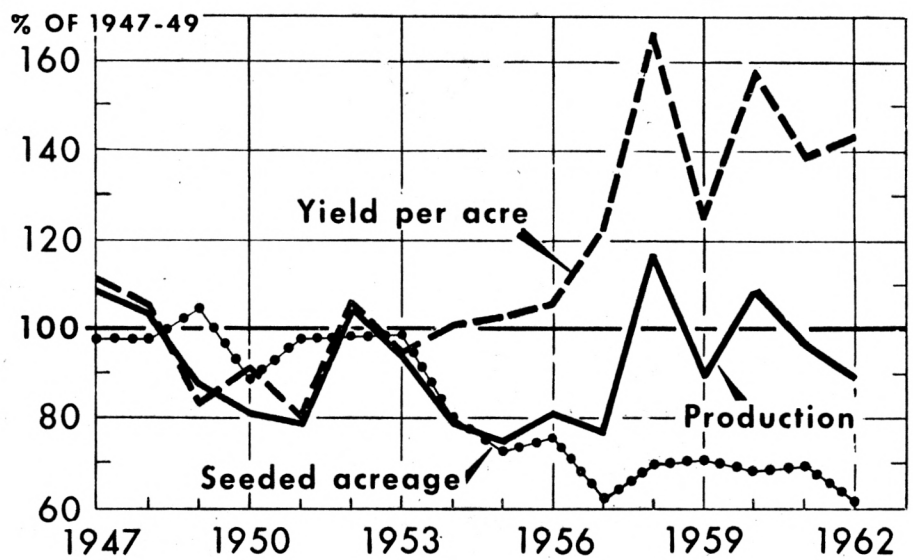

Fig. 1.—Wheat Acreage, Yield, and Production (1947-1962)

practices have also been growing. And the land remaining in production after acreage is restricted is most often the land best adapted to wheat production. Thus, the farmer has retired his poorest land with each additional allotment restriction.

Conversely, yields have increased little if at all during periods of acreage expansion. Such periods are characterized by those during and immediately following World War I, in the mid-20's, the mid-30's, and during and immediately after World War II.

This last period roughly corresponds with the 1946-53 acreage and yield information as shown in Table 1. As acreages increase, larger areas of marginal land are brought back into production. Farmers tend to spread their time and capital over more acres generally resulting in less intense cultivation and lower yields. The following discussion will help explain the existing trends in wheat yields and production.

> During and following both World Wars I and II, high prices and generally favorable weather made it profitable to plow up grassland, particularly in the Western Plains. Much of the land broken during and after World War I was abandoned with the advent of less favorable prices and weather. In the thirties and early forties, this land was returned to grass through artificial reseeding or natural revegetation. But during and after World War II, conditions were again favorable to a large plow-up of grassland.
>
> Most of these lands will produce high yields of wheat in favorable rainfall periods. They become marginal as low prices or unfavorable weather reduce income below costs of production. Some lands with poor soils become marginal more quickly than lands with good soils. But different soils or classes of land usually are

interspersed in most areas. These factors would appear to preclude the permanent labeling of extensive areas as marginal for wheat production.

Data for Wallace County, Kansas, will help to illustrate the problem that exists in some parts of the Great Plains. They are based on surveys in 1942 and an aerial check on land use in 1949, both of which were made by the Soil Conservation Service.

In 1942, more than a third of the cultivated land was in land classes VI and VII, not suitable for cultivation, more than a third was in class IV, subject to wind erosion and should be in grass half the time, and about a fourth was in classes II and III, suitable for cultivation with proper conservation practices. These surveys indicate that the acreage of cultivated land increased from 203,000 acres in 1942 to 256,000 in 1949, an increase of 53,000 acres at the expense of rangeland. More than half of this increase (29,000 acres) was in land classes VI and VII. From 1942 to 1949, also, the acreage of wheat tripled, expanding from 39,000 to 126,000 acres. Wheat was seeded on only 19 per cent of the cultivated land in 1942 compared with 49 per cent in 1949. Most of the cultivated land, including the plow-up, was devoted to the wheat rotation in 1949, as alternate wheat and fallow is the usual practice in Wallace County.[3]

During periods of restricted acreages, guaranteed support prices tend to encourage better cultural practices. When farmers' wheat acreages are restricted, they tend to use more resources such as fertilizer, insecticides, and water. The result, other things being equal, is a general increase in wheat yields.

A discussion of total wheat carryover stocks will be beneficial before advancing into the production and carryover of wheat by classes. In this manner an indication of the overall size of the carryover problem may be obtained.

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[3] Charles W. Nauheim, Warren R. Bailey, and Della E. Merrick, Wheat Production: Trends-Problems-Programs-Opportunities for Adjustment, Agricultural Research Service, USDA (Bulletin No. 179, March, 1958), pp. 80-81.

Figure 2 readily illustrates the total U. S. wheat supply, distribution, and carryover from 1935 to 1961. As shown in Fig. 2, carryover stocks have been growing rapidly since approximately 1951. Since 1958, the amount of annual carryover equalled or exceeded the combined annual distribution to domestic and export markets.

The large carryovers are not solely the result of high production. The more affluent countries, such as the United States, have been experiencing a decreasing per capita wheat consumption. But while per capita wheat use is declining in these countries, population growth is holding total wheat consumption nearly steady. Figure 2 shows domestic wheat consumption at approximately 600 million bushels for 1961 of which nearly 100 million bushels are for feed, seed, and industrial uses. The remaining 500 million bushels are used for food and this portion of domestic use has been maintained at about the same level as it was fifty years ago.

Total consumption of wheat in the world is increasing. In developing countries where incomes are low, increasing per capita consumption and population growth both contribute to increasing total wheat use. Total wheat consumption is not likely to decline in the foreseeable future. Some authorities expect per capita consumption to stabilize in the more affluent countries as the higher protein foods are substituted for wheat products at a less accelerated rate.

Nevertheless, the per capita consumption of wheat in

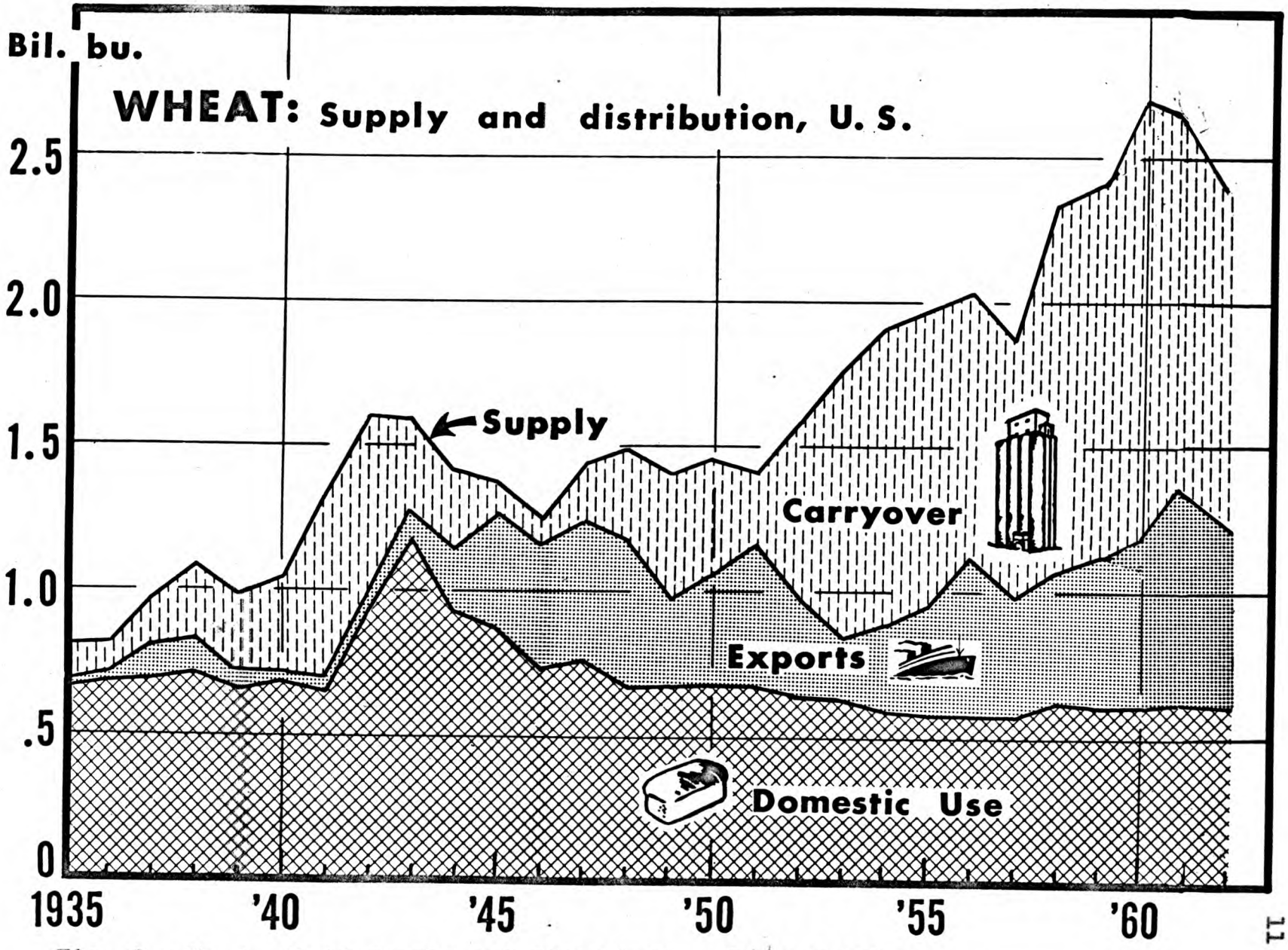

Fig. 2.--U. S. Wheat Supply and Distribution (1935-1962).

the U. S. in 1961 decreased one pound from that of 1960. This is a continuation of the post World War II trend from which the only variation was in 1958, when consumption showed a slight increase over 1957.[4]

The extent to which the United States has shared in the developing world market is also shown in Fig. 2. It will be noted that exports have been much more variable than domestic consumption. For the years of 1960-61, the export market constituted a larger portion of U. S. wheat distribution than did the domestic market. The volume of U. S. wheat channeled into export trade depends greatly upon the size of the world wheat crop and upon the ability of U. S. traders to compete in terms of price and quality considerations. Many marketing authorities feel that the export market could be increased considerably if certain government policies were to be changed. They believe that the existing market structure hinders the movement of much U. S. wheat to export channels. These points, however, shall be considered later in this paper. Nevertheless, it is felt that certain marketing hindrances as well as high production levels have contributed to the present carryover stocks.

One point should be emphasized before proceeding further. Carryover stocks are not synonymous with surplus stocks. A portion of the present carryover is needed for adequate cereal food reserves in case of emergency conditions,

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[4] Wheat Situation (No. 177, February, 1962), p. 5.

either natural or man-made. But it is difficult to imagine an emergency situation which would require all the present supplies of wheat.

Doll and Manning write, "The size of wheat reserve stocks needed by the United States has been variously estimated at from 100 million to 1 billion bushels, the differences in estimates resulting largely from differences in assumptions."[5] They feel that the maximum total reserve needed for all purposes is around 400 million bushels under present conditions. Any carryover stocks above this level would be considered as surplus. They recognize that a defense can be made for almost any level of wheat reserves.

The USDA, in Section 101 of the Agricultural Act of 1954, stated that the wheat reserve level should be not more than 500 million bushels and not less than 400 million bushels.[6] In November, 1962, Secretary Freeman indicated that the wheat reserve goal should be approximately 600 million bushels. The USDA believes that the total carryover should be equal to about one-half of the total annual utilization.[7]

Using the USDA's estimate of 600 million bushels of carryover reserve, the United States had approximately

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[5]Manning and Doll, op. cit., p. 14.

[6]Price Programs, USDA (Bulletin No. 135, April, 1957), p. 14.

[7]Talk by Orville Freeman at the 40th Annual Agricultural Outlook Conference, Washington, D. C., November 12, 1962.

600 million bushels of surplus wheat as of June, 1962. It is difficult to believe such a surplus condition will be tolerated indefinitely. Either the existing stocks must find a market or many wheat farmers may be forced to develop a vocation more useful than contributing to a growing commodity surplus.

Wheat Production and Carryover by Classes

There has been a tendency in past years for agricultural policy planners, laymen, and even a number of farmers to think of wheat as simply one homogeneous commodity. But what millers and bakers have known for decades--that various wheats differ in their characteristics almost as much as corn differs from grain sorghums--has only recently become significant to some groups of national policy planners, farmers, and laymen in general.

> Wheat grown in the United States belongs to three quite distinct botanical species. By far the most important of these is Triticum vulgare, or common wheat, which comprises nearly 95 per cent of the total production. The two other less important species are Triticum durum, which comprises the amber and red durums, and Triticum compactum, which includes the red and white club wheats.[8]

Durum and club wheats are grown in relatively small volumes and in concentrated geographical areas, none of which are in the Kansas High Plains vicinity. Their carryover stocks have not been alarmingly large. In fact, durum has at times been in short supply, especially following the small

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[8] E. J. Pyler, Baking Science and Technology (Chicago: Siebel Publishing Co., 1952), Vol. I, p. 191.

1961 crop. However, with a record large 1962 crop, there is now almost a two year supply of durum. In view of the past variability of durum production this does not appear to be a critically large supply. Therefore, durum and club wheats are of no particular significance in terms of this paper.

The common wheats are grouped into four major categories--hard red winter, hard red spring, soft red winter, and white. The four classes are centered in different sections of the United States. The geographical distributions for each class are presented in Fig. 3 which also indicates the relative sizes of the production areas. The indicated production boundaries are only approximate, with some local overlapping of class production. As will be shown later, there is evidence that these boundaries have changed since the data upon which Fig. 3 is based were gathered in 1959.

Much of the interest in production trends of the major wheat classes has arisen as a result of the lopsided composition of present carryover stocks. The estimated carryover of all wheat stocks on July 1, 1962, was 1,304 million bushels. Hard red winter wheat accounted for 1,067 million bushels or approximately 82 per cent of the total carryover. Table 2 indicates supply and distribution of classes for the period of 1952-1962.

Dahl summarizes the situation in an article from which the following data are taken.[9] Most of the carryover has

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[9]Reynold P. Dahl, "Classes of Wheat and the Surplus Problem," The Northwestern Miller, April 16, 1962, pp. 30-34.

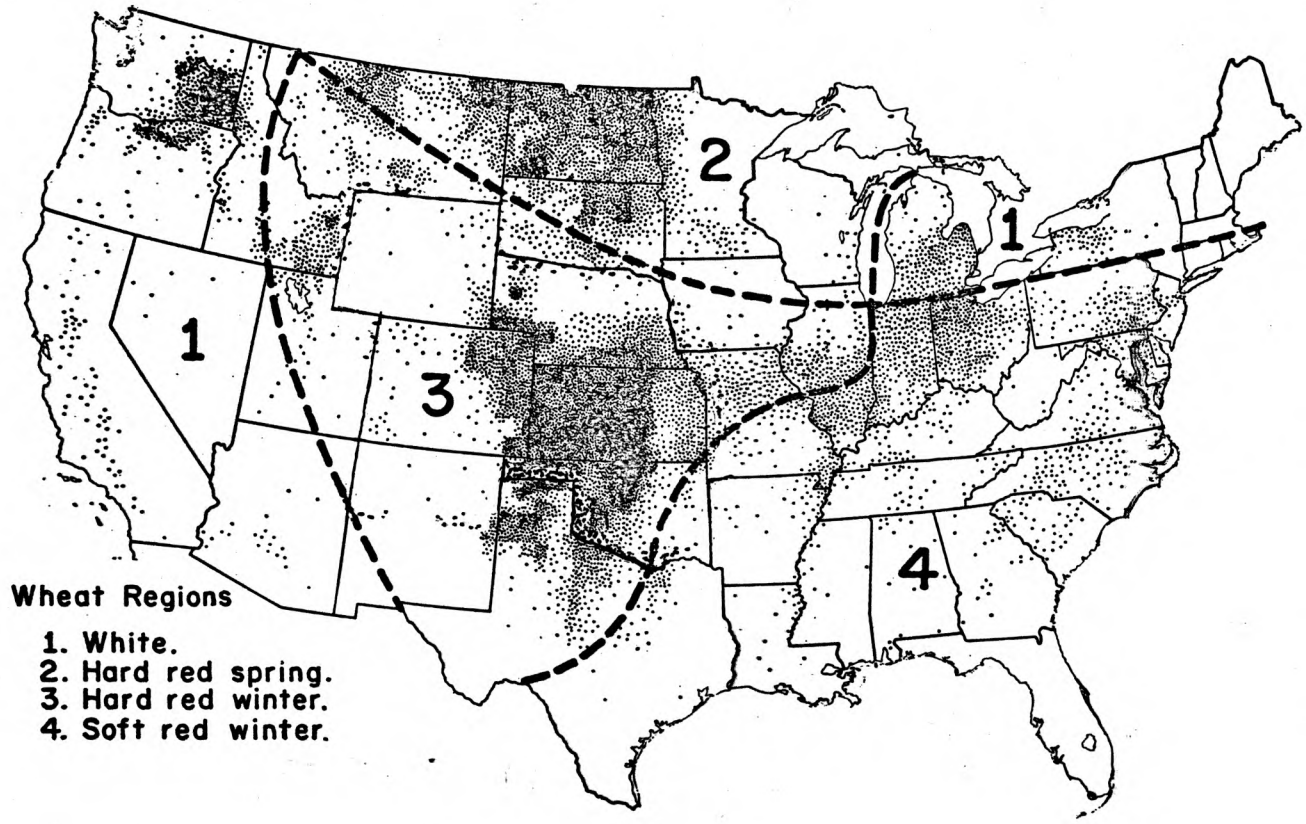

Fig. 3.—Distribution of Wheat in the United States, 1959

accumulated in the past decade. On July 1, 1952, the total carryover of wheat was only 256 million bushels. At that time hard red winter wheat stocks were 97 million bushels, or only about 38 per cent of total stocks. Thus, the addition of hard red winter wheat to carryover stocks in the last decade has been nearly 1 billion bushels. This represents over 93 per cent of the total wheat added to carryover in the last decade.

TABLE 2

ESTIMATED WHEAT CARRYOVER BY CLASSES (1952-1962)[a]
(1,000,000 BUSHELS)

Year	Total	HRW	SRW	HRS	Durum	White
1952	256	97	16	117	15	11
1953	606	395	38	128	7	38
1954	934	560	70	195	5	104
1955	1036	677	50	172	2	135
1956	1033	691	17	185	7	133
1957	909	648	10	196	13	42
1958	881	613	6	203	25	34
1959	1295	939	21	251	19	65
1960	1314	1006	10	218	14	66
1961	1412	1109	12	237	16	38
1962	1304	1067	24	187	5	21

[a] *Wheat Situation*, Economic Research Service, USDA (No. 179, June, 1962), p. 23; (No. 181, October, 1962), p. 4.

After this summary of carryover trends, one easily recognizes the rapid growth in relative size of hard red winter stocks. Trends in production by classes should also be reviewed to complete the picture.

As would be suspected, hard red winter wheat has increased in relative production as well as in carryover. The

following table shows that the percentage of total wheat acreage which has been devoted to hard red winter wheat has increased steadily from 32 per cent in 1919 to 56.7 per cent in 1959.

TABLE 3

ESTIMATED PERCENTAGE OF THE TOTAL WHEAT ACREAGE OF THE UNITED STATES OCCUPIED BY EACH OF THE 5 CLASSES OF WHEAT AT 5-YEAR INTERVALS (1919-1959)[a]

Class	Percentage of total wheat acreage for the years								
	1919	1924	1929	1934	1939	1944	1949	1954	1959
HRW	32.0	41.4	43.5	44.6	47.6	46.8	54.2	55.9	56.7
HRS	24.2	22.4	22.0	23.2	20.9	24.0	20.8	21.4	19.5
SRW	30.1	22.1	17.7	20.9	19.6	18.2	13.0	11.9	12.7
WHITE	7.3	5.9	7.4	6.7	6.6	7.7	7.8	8.3	9.0
DURUM	6.4	8.2	9.4	4.6	5.3	3.3	4.2	2.5	2.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[a] Distribution of the Varieties and Classes of Wheat in the United States in 1959, Agricultural Research Service, USDA (Bulletin No. 272, November, 1960), p. 83.

It is interesting to note that hard red spring and particularly soft red winter wheats have undergone a decline in acreage with hard red spring dropping 19.4 per cent of its 1919 percentage and soft red winter wheat decreased by nearly 57.8 per cent of its 1919 percentage. These trends indicate that hard red winter wheat has displaced soft winter and hard spring wheats in certain areas of the country. The approximate locations of these hard winter substitution areas are shown

by comparing Fig. 4, developed in 1949, with Fig. 3, drawn in 1959 and shown on a preceding page.

A comparison of Figs. 3 and 4 indicates that the hard winter production area has, in recent years, branched eastward into much of Missouri, Iowa, and Illinois. Hard winter wheat has also displaced hard spring wheat in portions of South Dakota and Montana. Hard winter wheat evidently has, for some farmers in these regions, a comparative advantage over other classes of wheat; hence such wheats have been displaced by hard winter varieties.

Dudley Russell, at a speech in Minneapolis, summarized several of the factors which have accounted for the substitution of hard winter for soft winter and hard spring wheats.[10] He feels that most of the Central Plains states had nearly ceased wheat production before:

> the artificially high prices of recent years encouraged nearly every farmer in some counties to plant his permissible 15 acre allotment. South Dakota formerly raised mostly spring wheat and is still a large producer, but development of better yielding and better quality winter wheat varieties in recent years has caused a considerable shift from springs to winters. South Dakota spring wheats are often rather high in ash, probably due to soil conditions, and consequently are discounted a few cents by flour mill buyers. Montana wheats are usually very high in protein and of excellent quality, but again there has been a rapid shift to hard winters in recent years.[11]

Furthermore, there has been a concentrated effort

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[10] Dudley Russell, "The Demand for Wheat by Classes," Paper presented at the Marketing Seminar, Minneapolis Grain Exchange, August 28, 1961.

[11] Ibid.

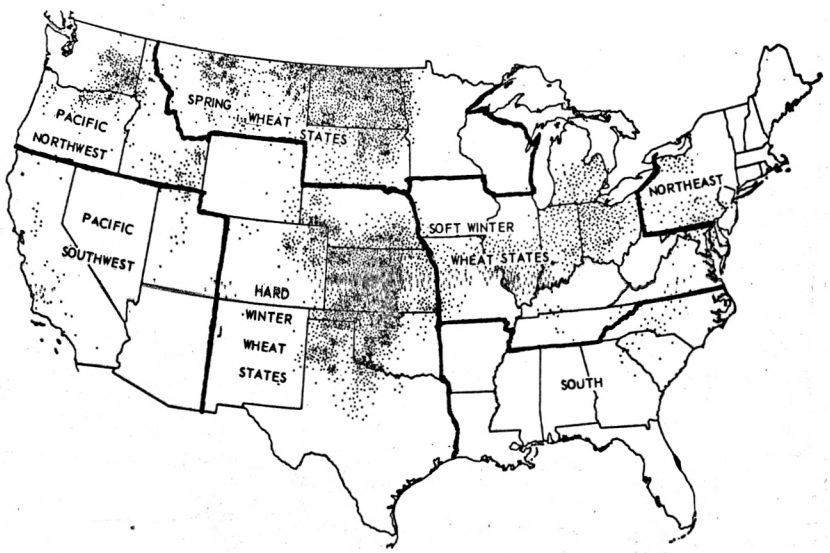

Fig. 4.—Distribution of Wheat in the United States, 1949

toward development of better wheat varieties in the Southern Great Plains, the home of hard winter wheat. This effort was brought forth primarily in the High Plains region because wheat is one of the few crops adapted to the semi-arid climate. As a result, varieties were developed which were early maturing, more resistant to disease and lodging, and which were higher yielding. Economic incentives led to the substitution of higher yielding hard winter varieties for soft winter wheats in Missouri, Illinois, Iowa, and other Central Plains states.

The trend toward substitution of classes is most conveniently illustrated in Table 4. States shown are those which have undergone significant shifts in class production. They are compared on the basis of hard red winter and either hard red spring, soft red winter, or both, depending upon which of the two latter classes is appropriate to the state being considered.

The foregoing discussion has shown that much of the total wheat carryover consists of hard winter stocks. It was also indicated that one reason for the huge hard winter carryover has been the increased production of hard winter wheat relative to hard spring and soft winter wheats. A further reason for the carryover of this particular class is indicated by consumption or utilization trends among the primary wheat classes. During the period of 1958-1963, the total disappearance of HRW wheat comprised 91.2 per cent of the

TABLE 4

ESTIMATED PERCENTAGE OF TOTAL WHEAT AREA OCCUPIED BY DOMINANT CLASSES IN SELECTED STATES (1945-1961)[a]

State and Class	Percentage of the classes								
	1919	1924	1929	1934	1939	1944	1949	1954	1959
Idaho									
HRW	17.1	27.8	26.4	30.5	36.7	37.5	42.1	42.9	44.0
HRS	20.6	14.9	7.5	5.8	6.4	5.1	4.9	7.3	4.6
SRW	6.5	5.0	4.8	3.5	2.0	1.3	0.5	--	--
Iowa									
HRW	55.0	86.0	89.1	91.8	89.9	95.7	90.6	84.9	90.9
HRS	42.1	11.5	7.9	6.6	9.6	4.0	9.1	13.4	7.8
Missouri									
HRW	14.6	10.2	8.5	6.1	12.6	7.0	47.7	54.5	67.0
SRW	85.1	89.8	91.5	93.9	87.4	92.9	52.3	44.8	32.8
Montana									
HRW	23.6	19.9	15.5	20.0	21.6	28.6	27.9	32.2	43.6
HRS	55.9	74.5	82.2	77.2	76.8	69.9	70.8	67.1	53.7
New Mexico									
HRW	65.3	83.8	91.6	93.0	93.9	92.0	93.6	98.1	99.6
WHITE	20.8	7.6	5.0	2.4	1.6	1.1	--	--	0.1
Oklahoma									
HRW	75.4	86.1	91.6	85.4	91.1	95.8	99.5	99.3	99.9
SRW	24.3	13.9	8.2	14.6	8.9	4.2	0.5	0.3	0.1
S. Dakota									
HRW	1.6	3.5	2.3	5.7	5.3	6.2	6.9	14.9	21.7
HRS	79.9	52.9	55.7	72.7	71.6	84.7	84.6	82.7	75.4
DURUM	18.5	43.4	41.3	19.0	18.9	7.9	8.5	2.4	2.9
Texas									
HRW	35.6	78.6	85.1	92.0	92.5	93.7	93.9	97.2	95.8
SRW	62.4	17.9	11.8	7.1	6.8	5.9	5.8	2.2	4.2
Utah									
HRW	34.4	52.0	53.7	54.8	64.2	54.0	80.8	66.8	71.4
WHITE	53.1	42.4	41.7	42.0	35.5	44.5	19.1	33.2	26.7
Wyoming									
HRW	18.4	12.6	40.1	50.7	41.8	62.7	78.9	83.5	90.9
HRS	48.9	69.6	45.6	36.9	50.4	33.4	20.0	13.3	8.1
DURUM	28.5	16.2	13.3	10.7	6.1	2.5	0.9	--	--

[a] Distribution of the Varieties and Classes of Wheat in the United States in 1959, Agricultural Research Service, USDA (Bulletin No. 272, November, 1960), pp. 79-82.

total HRW production. The comparable figures for SRW and HRS wheats respectively, are 100 per cent and 104.6 per cent. For all wheat during this period, total disappearance accounted for 95.8 per cent of the total production.[12] So despite the recently large export volume total utilization of wheat has not quite equalled production.

When national agricultural policy planners view the size and trend in carryover figures their first impulse is to decrease acreage allotments. Such has been the policy of wheat programs for the past several years. But with the intensive cultivation practices and resultant higher yields paralleling acreage restrictions, the effect on carryover stocks has been almost negligible.

Though the size of overall wheat stocks may not have been appreciably affected by government wheat programs, the compostion of stocks has been materially affected. Hard red winter wheat has become the major portion of total carryover. A seemingly logical step for USDA program planners to take is to further decrease allotments and to make acreage restrictions even more stringent for hard red winter wheat producers. This approach has been advocated by one of the present administration's agricultural economists. John Schnittker, in a 1961 article, wrote the following.

> Despite the lack of precedent in wheat programs, unequal reductions in marketings among regions ought to be explored when a new marketing quota program is written.

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[12] Figures compiled from data in Wheat Situation (No. 183, April, 1963), p. 6.

> Publicly-sponsored retirement of land from grain, which has been a part of the marketing quota programs for wheat discussed to date, would also be concentrated in certain regions, especially the Great Plains, under such a program, not distributed proportionally in wheat growing regions. Ideally, it should not be simply "land idling," but useful land-use planning. This would raise difficult problems of community adjustment and would surely require heavy compensation. But progress in changing land use in the Great Plains and elsewhere is not impossible.
>
> Unequal regional reductions in wheat marketings would make the already difficult problem of allocation of marketing quotas among regions even more complex. But the comparative overexpansion of wheat production in the Great Plains and the Northwest is a matter which will have to be faced, whatever form the wheat program takes, and it will be no easier if it is postponed for a few more years.[13]

The above quote is indicative of attitudes currently held by several economists. The economic consequences to Great Plains farmers as a result of unequal reductions in regional wheat allotments are likely to be quite unfavorable when compared with the effects on wheat farmers of other regions. Thus, Kansas and other Great Plains farmers may possibly expect to receive a disproportionately large share of any further decrease in national wheat acreage allotments. Such an action may be taken as a first step in correcting the huge carryover stocks, of which about 82 per cent consists of hard red winter wheat--wheat grown in the Great Plains area.

The decisive rejection of the 1964 crop wheat referendum indicates that producers feel a different attempt should be made to solve the wheat problem. But regardless of the type of wheat program in effect, this needlessly large wheat

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[13]John A. Schnittker, "Wheat and Farm Policy," American Economic Review, Vol. LI, No. 2 (May, 1961), p. 352.

stock, representing a sizeable taxpayer burden, will not be tolerated indefinitely. Hard winter wheat must find a market outlet or Great Plains farmers must prepare to tighten their belts. The next several sections of this paper will deal with major factors which have caused much hard winter wheat to be funneled into storage rather than finding a ready market.

CHAPTER II

WHEAT TRANSPORTATION STRUCTURE, PAST AND PRESENT

Any attempt to intensely study the history of transportation systems in the United States would, of necessity, require more knowledge and experience than are available to this writer. Transportation is one of the largest basic industries, commanding 100 billion dollars annually, and its development has played a major role in the progress achieved in this country.[14]

Because the transportation situation is so complex, only major developments with respect to wheat distribution shall be reviewed. Development of rail, truck, and barge transportation shall be considered as well as the different carriers' effects on the others. Finally, current costs of moving wheat by various carriers will be reviewed. Transportation rates from Kansas and other Great Plains states to Gulf ports will be of interest, particularly when compared with rates from Central Plains states of Missouri, Iowa, Illinois, etc. These comparisons will aid in showing the

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[14] W. H. Thompson, "Cross Currents in Transportation," Paper presented to the Grain and Feed Management Conference, Manhattan, Kansas, November 28, 1962.

effects which transportation rates have had on carryover stocks of hard red winter wheat.

Development of Rails, Rates, and Wheat Distribution by Rail

Railroad carriers have been the dominant haulers of wheat and wheat products since their youthful origins of around a century ago. The primary era of railroad expansion was in the approximate period of 1830-1910. Locklin describes the development as follows.

> In 1830, there were not more than 22 miles of railroad in use in the United States. In 1958, there were 218,399 miles. The decade of greatest expansion in the railroad net was the decade of the eighties. By 1890 nearly two thirds of our railway mileage had come into existence; by 1900, more than three fourths. The peak in railway mileage was attained in 1916, when there were 254,037 miles of railroad in the United States. Since then the mileage has declined. In 1958, the mileage was over 35,000 miles less than in 1916.[15]

The large period of expansion in Kansas and other Great Plains states was from approximately 1870-1900. The rapid growth of railroads was primarily a result of aid extended by federal, state, and local governments. Subsidies were given in the form of loans, cash donations, large land grants, and certain exemptioms from local taxation. Land grants to railroads were the most important form of federal aid.

> In all, 89 separate grants were made, 17 of which were later forfeited for failure to carry on the construction work, leaving 72 grants under which land was transferred.

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[15] D. P. Locklin, Economics of Transportation (Homewood, Illinois: Richard D. Irwin, Inc., 1960), pp. 83-84.

> Some idea of the magnitude of these grants to individual railroads is shown by the acreage received by the following railroads or predecessor companies: Chicago, Burlington, and Quincy, 3,200,000 acres; Illinois Central, 4,600,000; Chicago & North Western, 7,400,000; and Union Pacific, 19,000,000. The largest grant was to the Northern Pacific, which amounted to over 41,000,000 acres. The total acreage patented to railroad companies under these grants was over 130,000,000 acres. This represents an expanse of land equal in size to Michigan, Wisconsin, Illinois, Indiana, and nearly half of Ohio.[16]

Although aid extended to railroads by the federal government was enormous, the state and municipal governments also were huge donors. Locklin gives examples of such donations, two of which follow.

> In 1880, the Northern Pacific promised to extend its line to Superior, Wisconsin, if the city would give it a right of way into the city and one third of all lands, premises, and real estate in the city. The offer was accepted. Seattle offered the Northern Pacific 7500 town lots, 3500 acres of land, $50,000 in money, $200,000 in bonds, and the use of much of the waterfront for terminal purposes if the Northern Pacific would make Seattle its Western terminus.[17]

In the face of such subsidy offers, it is small wonder than the railroad network expanded rapidly. This early rise in rail carrier systems provided rails with a monopoly situation. Development of highway systems did not earnestly begin until a half century after the expansion of railroads. At the same time, relatively few navigational improvements had been made on the inland waterway system. The rail carriers' monopoly position often led to the policy of charging rates which the traffic would bear. This means that they granted

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[16] Ibid., p. 106.

[17] Ibid., p. 101.

concessions to commodities that would not move at normal rates and, when not stopped by regulatory agencies, charged higher rates than necessary on traffic that would bear high rates. Rate discrimination between commodities was accomplished by grouping commodities into various classes for the purpose of applying class rates. Also, special or commodity rates have been granted on articles for which the regular class rates are deemed unsuitable.

The railroad structure in this country was developed primarily on an east-west axis in order to facilitate exchange between the grain and livestock producing midwestern region and the populous consuming and manufacturing centers of Eastern Seaboard States. The concentration of existing railroads between these major areas is indicative of this east-west movement.

Wheat rates are also based on this west to east movement. Through rates are based on the distance between the originating station and the final market. As distances increase, rates will also increase but not in proportion to distance. Thus, if B is two times farther than C is from A, the AB rate will be less than twice as much as the AC rate. This less than proportional increase in rates occurs because the carriers' cost of service increases less than proportional with increases in distance.

Gradually transit privileges were incorporated into the rates as they were recognized to be in the public interest.

Under the transit privilege, wheat may be shipped from a local elevator to a primary market or milling center where it can be processed or even stored for a period of time, then shipped on to final market at the applicable through rate. This privilege makes all processors lying between the wheat producing region and consuming region competitive with respect to rates. The granting of transit privileges accounts for the wide scattering of milling points across the country.

Thus, the transportation structure has been historically based on areas of production to the west and areas of consumption in the east. This structure featured the movement of commodities from west to east with transit points and terminal markets between the two areas.

The importance of rail transportation to Kansas and other Great Plains states is evident. This area produces large volumes of wheat in excess of its local requirements. Until the last few years, rail service was the only means available for the distribution of Kansas wheat to terminal markets and consuming centers. Recently increased trucked wheat has somewhat changed the situation, however, railroads are still the dominant carriers of wheat and other grains over long distances.

Because the Great Plains area is so distant from export points and consuming centers, wheat grown in this region has always faced high transportation charges--higher than wheat grown in Illinois and other Central Plains states

for example. But the spread between rail rates from Great Plains states and those from Illinois, Missouri, Indiana, etc., to Gulf export points and the Eastern Seaboard has progressively widened. This increased spread in rates is a result of the manner in which railroads have chosen to implement rate increases.

Locklin discusses the two primary methods by which railroads have increased their freight rates.[18] The first and most used method until the last few years is the percentage increase in commodity rates. A percentage increase places a greater absolute increase on shippers who formerly paid the highest rates. The rate increase will be relatively small to the shippers who paid the lowest rates before. Thus, the long-distance shipper is most adversely affected by percentage increases in rates. The shipper who is nearer the market is least affected.

> In fact, the near producer may benefit from the rate increase because his distant competitors may be excluded from the market. Many of the general rate increases of recent years have been of the percentage variety.[19]

The other type of rate increase involves raising the rate a fixed amount per bushel, regardless of the length of haul. This is known as a per unit increase or a flat rate increase. Proposals of the railroads for rate changes in 1958 and subsequent years included many changes of the flat

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[18] Ibid., p. 341.

[19] Ibid., p. 39.

variety. An increase of this kind is equivalent to raising the cost curve uniformly among all wheat shippers.

Table 5 shows the rail rate index for wheat from the post World War II years through 1961. It can be seen that wheat rates, on a national average, about doubled from 1945-1958. Table 5 also points out that there has been a trend toward decreased rates since 1958. Reasons for this downward trend will be discussed later. However, it should be borne in mind that, because of the popularity of percentage rate increases in the past, Great Plains wheat producers have been more adversely affected than the national average index shown in this table. On the other hand, wheat producers closer to export and domestic markets have been subjected to smaller increases than Table 5 indicates.

TABLE 5

RAIL FREIGHT RATE INDEX FOR WHEAT (1945-1961)[a]
(1957-1959 = 100)

Year	Index	Year	Index
1945	53	1954	89
1946	54	1955	89
1947	61	1956	94
1948	73	1957	99
1949	77	1958	101
1950	79	1959	100
1951	81	1960	99
1952	87	1961	97
1953	89		

[a]Marketing and Transportation Situation, Economic Research Service, USDA (No. 147, November, 1962), p. 14.

Percentage increases in rates have been dominant in the past because they provided rail carriers more revenue than would have been obtained from flat or per unit increases. This was particularly true as a result of their nearly monopolistic transportation services. Dr. W. H. Thompson has stated that the decades of the 30's, 40's, and 50's:

> was a period during which railroads were virtually the only carriers of ag commodities over long distances. The rails charged what the traffic would bear. Not until the latter 50's did rails recognize trucks as being competitive carriers. During the period of 1946-1960, rail rates were increased until the resulting rates had risen 104 per cent (on a national average). The rail carriers' short-sighted view at that time was one of obtaining more revenue--regardless of the effect that higher rail rates might have on the future traffic or volume of competitive carriers.[20]

The effect which higher rail rates have had on the traffic of competitive carriers shall be examined after a look into the development of truck and water carriers. During the analysis of this competition it will become evident why rail rates have declined since 1958 (as shown in Table 5). The resultant position of Great Plains wheat producers with respect to transportation charges will then be brought more clearly into focus.

Development of Truck and Water Carriers, Their Influence in Wheat Distribution

As was noted earlier, the period through the early 50's saw rail carriers holding a virtual monopoly on transport services in the Great Plains. Modern barge transportation on

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[20]Thompson, loc. cit.

inland waterways began in the 1920's with the use of the diesel engine to propel towboats. But the waterways were to receive much public aid in subsequent years which made water carriers more competitive for grain traffic.

Intercity truck transport also began in the 1920's primarily in heavily populated regions of the East. But the rapid development of motor vehicles and improved highways has had serious effects on railroad grain traffic. The tremendous growth of truck transportation may be seen in the rapid increase in motor-truck registrations. The number of privately owned trucks in the United States, 1905-1958, is shown in Table 6. Note that the number of trucks more than doubled from 1945 to 1955.

TABLE 6

MOTOR-TRUCK REGISTRATIONS IN THE UNITED STATES[a]
(PRIVATELY OWNED)

Year	Number	Year	Number
1905	1,400	1940	4,590,386
1910	10,123	1945	4,834,742
1915	158,506	1950	8,272,153
1920	1,107,639	1955	9,893,410
1925	2,483,215	1956	10,261,827
1930	3,518,747	1957	10,492,617
1935	3,675,865	1958	10,659,310

[a]D. P. Locklin, Economics of Transportation (Homewood, Illinois: Richard D. Irwin, Inc., 1960), p. 614.

The rapid growth of the trucking industry can be primarily attributed to the Federal Highway Acts of 1921, 1944, and 1956. These Acts deemed highway construction and

maintenance to be in the public interest and they generally called for federal funds to be supplemented by the states on a 50-50 basis. Of the $42 billion authorized for highway purposes by the 1956 Act, "$25 billion was to finance the construction of the National System of Interstate and Defense Highways. The federal government is to pay 90 per cent of the cost of the Interstate System; the states, 10 per cent."[21]

Truck carriers are classified as either common, contract, or private carriers.

> The common and contract carriers are regulated by the Interstate Commerce Commission (as are the railroads), but they move grain on back-hauls during which time they are not subject to ICC regulations. The exempt or private carriers' routes and rates are not regulated by ICC for non-processed agricultural commodities. Private carriers are those owned or leased by elevators. Trucks on a back-haul have a rate advantage over railroads in so far as trucks can price on the basis of variable costs. Railroads, however, comprise a high fixed cost industry in which their rate structure must cover the cost of operating and maintaining their rolling stock, road beds, stations, etc. So, much of the trucked grain moves on the back-haul with private truckers hauling primarily to the processors and contract truckers hauling mainly to terminals.[22]

The growth in barge movement of wheat has largely paralled that of truck movement. Water transportation, like highway transportation but unlike railway transportation, is a mode of transport in which the way is provided and maintained at public expense. Locklin gives several reasons for the growth of inland waterway systems.

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[21]Locklin, op. cit., p. 62.

[22]Thompson, loc. cit.

> First, inland waterway development was part of the program for conservation of natural resources, a movement that was strong during the administration of Theodore Roosevelt. Second, the rising freight rates after 1910, and particularly after the outbreak of World War I, created a demand for cheaper forms of transportation. In the effort to throw off the burden of rising freight rates, the possibilities of water transportation were not overlooked. A third reason for the revival of interest was the belief that the development of waterways would keep rail rates down. Water transportation was seen as an automatic regulator of railway rates. A fourth cause of interest in the movement was the belief that waterways were needed to relieve traffic congestion on the railroads. Recurring periods of traffic congestion were responsible for this belief. Lastly, waterway projects were pushed with vigor by the communities and interests which hoped to gain by the policy.[23]

Thus, a public desire for cheaper transportation initiated federal appropriations for construction and maintenance of inland waterway systems. The lower rates charged by water carriers than are charged by rail carriers are explained by the lower costs of water carriers. There is no user or maintenance charge for the use of waterways. Waterways, as well as highways, are maintained by the federal and state governments. If the cost of constructing and maintaining waterways, which is a social or taxpayer cost, is included in the cost of water transportation, it would be seen that the real cost is often much greater than the rates which are made by water carriers.

Railroads have been one of the most outspoken opponents of public waterway and highway development and maintenance.[24]

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[23]Locklin, op. cit., p. 713.

[24]Locklin, op. cit., p. 725.

The railroads argue that since water and highway transportation is subsidized, a condition of unfair competition is created. The water or highway carrier can quote lower rates because they pay no user charges for their "road" systems. The railroad, however, has to maintain its roadbed and pay a return on capital invested in it. Waterway and highway transportation has been developed on the theory that it is proper for the public to pay part of the costs of transportation. Rail transportation has developed on the theory that the users should pay all the costs of operation. When the different modes of transport come into competition, those which are supported in part by public funds have a competitive advantage over rails.

The next section will show that rail carriers have just cause for concern. It will be pointed out that Great Plains wheat producers, because of their dependence on rail transportation, should also be concerned with transportation developments.

Carrier Competition for Grain Traffic

As will be recalled, Table 5 shows that rail wheat rates have declined since 1958. This decrease represents rail carriers' efforts to meet truck and barge competition for grain traffic. Robert Haldeman, formerly with the Agricultural Marketing Service, has broadly summarized developments in grain transportation since 1958 with the following statement.

> In the Transportation Act of 1958, the Rule of Rate Making of the ICC Act was amended to read: Rates of a carrier should not be held up to a particular level to protect the traffic of any other mode of transportation, giving due consideration to the objectives of the national transportation policy declared in this Act.
>
> Since this became effective, the Commission, carriers, and shippers have increased the use of carrier costs in supporting proposed rate charges. Loss of grain traffic by the rails and the 1958 provisions of the Act have encouraged the rails to reduce rates where costs and competition support proposed adjustments. Rail accessional services have been cut to reduce costs. Selective piece-meal rate cutting has disrupted historic grain marketing channels that equalized grain transportation charges by rail from broad producing areas in the North Central Region to numerous markets in the east and south.[25]

Water carriers have been particularly successful in their bid for increased grain traffic. Much of their success can be attributed to their relatively low cost of moving grain. Thompson illustrated costs for the various carriers with the following figures (based on a national average): barges, 3-5 mills per ton-mile; trucks, 17 mills per ton-mile; and railroads, 12-22 mills per ton-mile.[26] The truck rate is based on the availability of a two-way or back-haul.

As is generally recognized, rail grain traffic into the terminal river markets has been eroded by truck competition, trucks being able to undercut the comparatively high rail charges.[27] Beyond these markets a large percentage of grain

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[25]Robert C. Haldeman, "Research Findings on the Transportation of Grain," New Methods and Tools for Improving Agricultural Marketing, Agricultural Marketing Service, USDA (July, 1961), pp. 168-169.

[26]Thompson, loc. cit.

[27]Grain Transportation in the North Central Region, USDA (Bulletin No. 490, July, 1961), p. 26.

moves by water. The following statements illustrate the trends in grain traffic of the competing carriers.

> Of the 1959 grain shipments from Omaha, less than 1 per cent was by truck, about 5 per cent was by barge, and the remainder was shipped by rail. In 1954, about 0.5 per cent of total shipments were by truck and barge combined. Rail accounted for 73 per cent of total grain shipments from Minneapolis in 1959, compared with 89 per cent in 1954. Barge shipments from Minneapolis, St. Paul, Savage, and Red Wing increased from 10 per cent of the total in 1954 to 27 per cent in 1959.[28]

Much the same trend was noted in the Kansas City and Omaha market receipts.[29] In 1958, 92 per cent of the total nongovernment grain shipments from country elevators to the Kansas City market moved by rail. Truck volume totaled over 10 million bushels, 8 per cent of the total shipments. 93 per cent of Omaha's receipts were by rail and the remaining 7 per cent were by truck. In 1954, over 97 per cent of nongovernment grain shipped to these markets arrived by rail. Truck traffic increased from less than 3 per cent of total receipts to almost 8 per cent in this four year period.

The trend toward truck and barge traffic has gained momentum in the last several years. This is the concensus of officers of the Kansas City Board of Trade who gave the following figures on wheat shipments from Kansas City.[30] In 1955, the railroads handled 98 per cent of the wheat during

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[28] Ibid., p. 92.

[29] Ibid., p. 39.

[30] Roderick Turnbull, "In the Grain Trade," The Kansas City Star, December 23, 1962, and January 6, 1963.

the barge season. By 1961, the rails had only 70.5 per cent of the business and in 1962, the rails dropped to 48.5 per cent. The barge percentages for these same years, respectively, were 2 per cent, 29.5 per cent, and 51.5 per cent during the barge seasons.

Another significant factor which they noted was that nearly all of the wheat which went down the river by barge was hauled to river elevators by truck. In fact, truck rates lower than rail freight rates to Kansas City along with equal barge and rail rates to the Gulf provided the combination that boosted the barge and truck business. While exact figures are not available, a close estimate is that from October 1, 1961, through October, 1962, 27,263,000 bushels of wheat were trucked into the Kansas City market.[31]

Rail carriers, in December, 1962, filed an application with the Interstate Commerce Commission for lowered rates from stations in Missouri, Kansas, Nebraska, Oklahoma, and Colorado to Missouri River terminals. Their reasons for rate changes included the increase in barge shipments on the Missouri River. They also indicated that a study revealed that nearly 100 per cent of the wheat which was barged out of the river markets was received by truck. The only definite figures available on barged wheat are those for the Kansas City market and they were included in the rails' rate application.[32] The

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[31]Turnbull, ibid., January 6, 1963.

[32]Interview with George Hutchins, Tariff Manager, Kansas Motor Carriers Association, Topeka, Kansas, June 7, 1963.

figures furnished by the rail carriers are given in Table 7.

TABLE 7

RAIL AND BARGE WHEAT SHIPMENTS FROM KANSAS CITY (BU.)[a]

Barge Season	Barge Shipments Wheat	Barge Shipments All Grains	Rail Shipments of Wheat During the Barge Season
1955	985,400	1,221,700	47,023,200
1956	3,373,921	3,922,490	42,984,000
1957	2,968,226	3,147,789	37,261,800
1958	4,775,430	6,070,607	34,068,600
1959	5,116,438	9,211,483	25,497,000
1960	11,970,212	19,469,220	41,596,200
1961	15,863,425	20,876,466	37,706,680
1962	27,897,006	31,309,656	26,981,980

[a]Data provided by George Hutchins, Kansas Motor Carriers Assoc., Topeka, Kansas.

Water and truck transportation are indeed an advantage when they are accessible. Thus, for those producers along or near navigable rivers, barge transportation has enhanced their local market prices. Leslie Sheffield, formerly of Great Plains Wheat, Inc., outlined the situation of Great Plains wheat producers with respect to relative transportation facilities and charges.

> What has hurt the Great Plains states most in transportation is that the railroads have increased their freight rates on a straight percentage basis thus penalizing the area of longest haul. Also, while barge and truck movements of grain have increased enormously, according to studies conducted by the USDA, unfortunately the Great Plains is a semiarid region and we are not blessed with large rivers which can float barges with 9 to 12 foot drafts such as you find farther east and in the Pacific Northwest. Truck movement of grain has increased in our region but because of the length of haul and the difficulty of obtaining back-hauls, the costs are higher than from many other producing

> regions. With grain traded on an eighth to a fourth cent per bushel for both domestic and export sales, it is not difficult to understand why we have so many white concrete monuments full of grain stranded in our Great Plains region.[33]

Although Great Plains producers have been able to take advantage of transportation rates lower than those of several years ago, they still face higher carrier charges than do the hard winter wheat producers of Eastern Nebraska, Kansas, and Oklahoma, and Iowa, Missouri, and Illinois. These high transportation costs are a major reason for the pile-up of wheat stocks in the Great Plains. Various carrier rates from the different states to Gulf export points are discussed in the following section. Detailed tables of rates are shown in the Appendix.

The transportation rates show that hard winter wheat can be delivered to New Orleans much more cheaply from Illinois and Missouri counties than from the Great Plains regions farther west. To qualify for an export subsidy an exporter needs only to supply wheat that meets the specified federal grade. Because of its relatively low cost at Gulf ports, Mississippi and Missouri River Basin wheat will first come under the scrutiny of the exporter. Great Plains wheat, because of its greater distance from export points and correspondingly higher transportation charges combined with existing basic loan rates, will move to export only after the

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[33]Leslie Sheffield, "Activities of Great Plains Wheat, Inc.," New Methods and Tools for Improving Agricultural Marketing, Agricultural Marketing Service, USDA (July, 1961), pp. 168-169.

river basin wheats have been sufficiently picked over. This, then, is the manner in which transportation rates have aided the growth of carryover stocks in the Great Plains area.

Although hard winter wheat grown on the Great Plains is recognized as being superior in bread baking quality to the hard winters grown in Missouri, Illinois, and Iowa, Great Plains wheat is also higher priced at many domestic and export markets. And it is the price--quality relationship that determines which wheats will be moved onto the markets. The size of carryover stocks in the Great Plains indicates that the superior quality of this wheat has not been enough to offset the adverse transportation charges. Consequently, lower quality hard winter wheat grown closer to the Gulf ports has been purchased and exported while Great Plains wheat has largely gone into carryover stocks.

CHAPTER III

ANALYSIS OF THE PRICE SUPPORT PROGRAM FOR WHEAT

What originally began as a price stabilization program in 1933 has gradually grown into the presently immense Commodity Credit Corporation. The development of federal programs has prompted Geoffrey Shepherd to summarize past events with the following statement.

> The original objective of the storage programs in 1933 was to operate them as price-stabilization programs to stabilize the prices of farm products against year-to-year variations in production.
>
> In actual fact, however, the programs soon began to go further than this. After the first few years, the objective changed from merely stabilizing prices to stabilizing them upward. Loan rates were set above the average-weather-crop levels, at certain percentages of parity prices. This raised the level of prices as well as stabilized them against variations in supply. This high level of prices stimulated production, reduced consumption, and led to the accumulation of unsalable surpluses in storage.
>
> The storage programs had some supporting effect on farm prices and income. Most of the gain in farm income, however, was only temporary. It was attained because quantities of feed grains and wheat were removed from the market and held in government storage. Some of this grain was disposed of abroad under Public Law 480 and other subsidy programs. The major share, however, seems destined for the domestic market. When it is eventually released into domestic channels, it will depress prices and incomes about as much when it comes back on the market as it raised them when it was taken off. There will be no net gain so far as those quantities are concerned over the period as a whole. Most of the gain was borrowed from the future, and when the future arrives,

it will have to be paid back.[34]

Review of Price Support Programs

The farm agitation of the late 1920's which led to the agricultural policies and programs of the 1930's arose out of the widespread dissatisfaction with the prevailing agricultural prices.

> Farm prices fell sharply after 1928 and aggregate net farm income was nearly zero by 1932. With those developments, the immediate goals of farm people crystallized. To re-establish their income position by creating conditions in agricultural markets which would raise farm prices became almost an exclusive goal of farm policy. If a bit of individual freedom was about to be lost, few took note in 1933; fewer still mourned its loss. Lack of income had imposed its own unique restraints on farmers for the preceeding decade.[35]

The Agricultural Adjustment Act of 1933-1936 was one of the many measures enacted to revive the U. S. economy from its depression depth. It was declared to be the policy of Congress to establish and maintain conditions so that farm prices would be at levels such that farm commodities would have purchasing power equivalent to their purchasing power in the period of 1909-1914. This introduced the concept of parity prices and parity incomes for farmers.

Reduced farm production was recognized to be a necessary condition to achieve the objectives of increased farm

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[34]Geoffrey Shepherd, Appraisal of the Federal Feed Grains Program, Agricultural and Home Economics Experiment Station, Iowa State University, Ames, Iowa (Research Bulletin No. 501, January, 1962), p. 350.

[35]John A. Schnittker, Wheat Problems and Programs in the United States, University of Missouri, Columbia, Mo. (Research Bulletin No. 753, September, 1960), p. 8.

prices and incomes. For wheat, these objectives were to be achieved through a voluntary domestic allotment program in which participating farmers received cash payments. "Comparatively large price increases were expected to follow relatively small reductions in output, and farm income from wheat was expected to rise accordingly."[36]

The Soil Conservation and Domestic Allotment Act which was in effect during 1936-1938 was very similar to the AAA of 1933. Both Acts were products of the depressed economy and both had increased farm income as their goals.

The 1938 AAA is significant for its price supporting method. "The basic mechanism for supporting the price of wheat and the incomes of wheat producers was established in 1938 and has not changed materially to 1960."[37] National and farm marketing quotas were to be announced and put into effect upon approval by producers. Individual farm acreages were defined as well as the conditions under which they were to be in effect. The Commodity Credit Corporation was directed to make available nonrecourse price support loans on wheat. This method of operation was designed to divert enough wheat from market channels to keep prices at or near pre-announced levels. The acreage reduction was to minimize the quantities diverted.

The loan rate level under the AAA of 1938 ranged from 52 to 75 per cent of parity. During World War II, the AAA

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[36] Ibid., p. 9.

[37] Ibid., p. 11.

was amended to support the 1941 wheat crop at 85 per cent of parity. At the same time, producers with not more than 15 acres of wheat were exempted from marketing quotas. The Stabilization Act of 1942 provided price supports for wheat at 90 per cent of parity for at least two years after the official end of World War II. Price supports for wheat at 90 per cent of parity finally ended with the 1955 crop. During subsequent years, a flexible support program called for falling support rates as wheat stocks increased in size.

And what was the result of high loan rates? Shepherd states, "This high level of prices stimulated production, reduced consumption, and led to accumulation of unsalable surpluses in storage."[38] Schnittker adds:

> Since 1952, the average U. S. farm price (for wheat) has seldom been above the loan rate and there were few opportunities to sell grain, pledged under a price support loan, at a profit in the market. About eighty-five per cent of all wheat placed under loan or purchase agreement since 1952 has been delivered to the CCC.[39]

Effect of Price Support Programs on the Marketing of Great Plains Wheat

As will be recalled from a previous section, over 97 per cent of the addition to total wheat carryover since 1952 has consisted of hard red winter wheat. The high levels of price support have been instrumental in diverting this wheat to storage. But even more important has been the method of

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[38] Shepherd, op. cit., p. 355.

[39] Schnittker, Wheat Problems and Programs in the United States, p. 16.

computing county loan rates.

Wheat eligible for support rates must be wheat of any class grading Number 3 or better except for wheat which, because of its test weight only, grades 4, 5, or Sample grade. Weevily, ergoty, or treated wheat is not eligible. For all practical purposes, any wheat grown in the commercial wheat area is eligible for price support providing the producer planted within his allotment. The basic support rate for 1962 crop wheat as issued in a county applies to Number 1 grade regardless of the class. Lower grades are supported at discounts and wheats having a sedimentation value of 40 or above are supported at premiums, the premium increasing as the sedimentation value increases. Premiums on previous crops were based on protein content and premiums for the 1963 crop are based on both protein and sedimentation values.

Basic support rates are first established for wheat stored in warehouses at designated terminal markets. These rates apply to wheat that has been shipped by rail to the terminal storage point. The basic rate for a given county is based upon the applicable terminal market rate less rail freight and elevator handling charges.

Thus, a county's loan rate depends on the county's geographical location with respect to the applicable domestic market. This was a logical basis for determining loan rates as long as the large bulk of wheat moved to domestic markets. But with the advent of Public Law 480, Food for Peace, etc.,

and increased cash export sales, over half of the annual wheat disappearance is through export channels. Yet the support rates are still tied to the domestic market. The result of this situation has been to divert large amounts of Great Plains wheat into storage facilities rather than into market channels. The high loan rate, in conjunction with the transportation structure, has priced much of the Plains-produced wheat out of the export market. This is because the loan rate acts as a price floor above which the cash market must rise if wheat is to be diverted away from Commodity Credit Corporation stocks.

Consider the case of a commercial exporter at the Gulf who is buying wheat to fill a contract with a foreign buyer. The exporter is required to deliver wheat of the federal grade specified in the contract. He will attempt to do so by purchasing wheat that has the most favorable price. Suppose that wheat prices at the Gulf are represented by the loan rate of the originating county plus the lowest cost transportation rate to the Gulf port. Table 8 shows the cost per hundredweight at the Gulf of hard red winter wheat from selected counties both in and out of the Great Plains area.

Table 8 shows that the cost of hard winter wheat originating in Illinois and Missouri counties as well as in counties of Eastern Kansas, Nebraska, and Oklahoma is much less than the cost of hard winter wheat originating in Great Plains areas of Western Kansas, Nebraska, and Oklahoma, and

TABLE 8

COST OF HARD WINTER WHEAT DELIVERED AT GULF FROM SELECTED COUNTIES

County and State	Wheat acreage in HRW wheat[a]	Rail rate to Gulf[b]	Barge or barge-rail rate to Gulf[b]	Truck or truck-barge rate to Gulf[b]	1962 loan rate	Minimum cost at Gulf
	(per cent)	(cents per hundredweight)			(dollars per cwt)	
Des Moines, Iowa	86.5	66.0	18.80	--	3.37	3.56
Adams, Ill.	94.8	32.5	18.80	--	3.38	3.57
Tazewell, Ill.	93.7	32.5	16.85	--	3.43	3.60
Choctaw, Okla.	100.0	44.5	--	33.00	3.32	3.65
Chariton, Mo.	92.5	45.5	24.20	--	3.45	3.69
Dewey, Okla.	99.9	45.5	--	41.00	3.30	3.71
Ray, Mo.	98.7	58.0	24.20	--	3.48	3.72
Buchanon, Mo.	98.7	58.0	26.95	--	3.50	3.77
Atchison, Kans.	99.5	58.0	26.95	--	3.50	3.77
Jewell, Kans.	100.0	58.0	--	42.20	3.37	3.79
Cheyenne, Kans.	100.0	70.0	--	54.20	3.25	3.79
Kingman, Kans.	100.0	59.5	--	44.20	3.35	3.79
Morrill, Nebr.	98.4	80.0	--	61.20	3.22	3.83
Arthur, Nebr.	96.7	--	--	61.20	3.25	3.86

[a]Average percentage for the crop reporting district in which the county is located.

[b]Refer to Appendix for detailed tables of rail, truck, and barge wheat transportation rates.

Eastern Colorado.

However, Table 8 fails to show to the full extent the difficulty of moving Great Plains wheat to export points. The marketing problem caused by high basic loan rates in Plains counties is compounded by the schedule of support premiums developed for sedimentation content. This schedule for the 1962 crop is shown in Table 9.

TABLE 9

SEDIMENTATION PREMIUM SCHEDULE FOR 1962 CROP HARD WHEAT

Sedimentation Value	Premium per bu.	Sedimentation Value	Premium per bu.
40	3¢	53	14¢
41	3	54	15
42	3	55	16
43	4	56	17
44	5	57	18
45	6	58	19
46	7	59	20
47	8	60	21
48	9	61	22
49	10	62	23
50	11	63	24
51	12	64 or above	25
52	13		

The sedimentation value indicates a wheat's gluten quality. Protein content, used as a premium basis in previous years, indicates a wheat's gluten quantity. The grain trade is still basing premiums in the cash market on the basis of protein content. The feeling of the grain trade has been that a wheat's sedimentation premium prices it above what the market considers to be the actual value of that wheat.

The result is that high sedimentation wheat has a loan value so high that the cash market will not pay sufficiently to bring the wheat on the market.[40] Consequently, higher sedimentation wheats often are diverted into CCC stocks.

The source of high quality hard red winter wheats is almost universally recognized to lie in the Great Plains production area of Western Kansas, Nebraska, Oklahoma, and Eastern Colorado. Sedimentation premiums in these areas are desirable to the farmer in the short run in that they increase the net loan rate and provide an upward push to the cash market. But such premiums will be undesirable to these wheat producers if the high loan rates price wheat out of the cash markets and direct it into government stocks. The long run result of concentrating hard winter wheat in carryover stocks is likely to be a heavy decrease in hard winter wheat acreage allotments.[41] Political pressure could rapidly bring such acreage reductions in the Great Plains. If high price supports in the Plains require drastic acreage reductions, it is doubtful that such supports will be in the long run interests of Plains farmers.

In reviewing effects of the price support program on Great Plains wheat movements, it should be noted that the program was developed and is still administered on a domestic

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[40]Roderick Turnbull, "In the Grain Trade," The Kansas City Star, February 10, 1963.

[41]This is the feeling of Dr. Leonard Schruben as stated in an interview with Roderick Turnbull. See Turnbull, ibid., November 4, 1962.

basis. County loan rates are based on an easterly movement of wheat to terminal markets and wheat products to consuming centers of the East. County rates are the applicable terminal rate less rail transportation and handling charges.

However, over half of the wheat annually distributed finds its way into an export market. Wheat in Western Kansas, for example, because of its high freight charges to a shipping port, is not worth as much to an exporter as is the same class of wheat in Illinois or Missouri. Yet, as shown in Table 8, wheats in these varied locations have nearly the same support rates. This is because they are located at nearly equal distances from terminal markets. An exporter can much easier pay the loan rate plus freight charges for wheat in Illinois than he can for wheat in Western Kansas. As long as Illinois wheat will satisfy the federal grade specified in an exporter's contract, the exporter will first purchase that wheat. Thus, wheat in Western Kansas will be purchased only after the available supplies of Illinois, Missouri, and other low freight origins are exhausted.

To make the loan rate program a truly price-supporting program in the Great Plains rather than an almost automatic acquisition program for hard red winter wheat, county loan rates should be based in part on the export market. Not only have export markets been the dominant outlet over the last few years, but they seem to hold the promise of future expansion.

A county's loan rate, when based on the export market, would be the applicable export market loan rate less freight and handling charges to that market. The Gulf points are the primary export markets for hard red winter wheat grown in Illinois, Missouri, Iowa, Texas, Oklahoma, Kansas, Colorado, Nebraska, etc. Under this basis, the loan rate for a county in Western Kansas would be much lower than the loan rate for an Illinois county. For example, Cheyenne County in Northwestern Kansas had a 1962 loan rate of $1.95 per bushel; whereas Adams County, Illinois, had a rate of $2.03 per bushel. If the loan was based on the New Orleans export market, it would be the New Orleans loan rate less transportation and handling charges. The 1962 loan rate at New Orleans was $2.47 per bushel. The rail rate from Cheyenne County, Kansas, to New Orleans is 42¢ per bushel.[42] The freight charge plus an estimated handling charge of 7¢ per bushel would make the Cheyenne County loan rate $1.98 per bushel. The Adams County rate would be $2.47 less rail freight charges of approximately 20¢ and handling charges of 7¢, or approximately $2.20 per bushel.[43]

Although the Kansas farmer would probably realize a smaller net return per bushel on his wheat as a result of the lower support rates, the cash market could acquire a relatively

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[42] Refer to Table 1 of the Appendix.

[43] Approximate rail rate furnished by Joe Lynch, formerly of the Kansas City Board of Trade, in an interview on July 18, 1962.

larger share of the wheat. The loan rate would become a price stabilizing factor rather than a price which results in government acquisition of the bulk of the wheat. This would alleviate the tendency of hard red winter wheat of the Plains to end up in carryover stocks. Furthermore, political pressure to decrease Plains wheat acreages because of the huge carryovers would be reduced.

On the other hand, hard winter wheat grown in Illinois, Missouri, and Eastern Kansas, Oklahoma, and Nebraska would more likely be diverted into carryover stocks. This would result from the inferior bread-baking quality of wheats grown in these regions. Great Plains wheat is recognized to be of superior bread-baking quality and is the type wheat most wanted by foreign representatives as illustrated in Table 10.

Though Great Plains wheat is of superior quality, it is also much higher priced at Gulf markets than is wheat grown along the Mississippi Basin system. The price-quality relationships of wheats determine which wheat will be utilized. Under the present combination of price supports and transportation charges, Great Plains wheat has been regularly priced above its true value as determined in the cash markets. Thus, it has added heavily to total carryover stocks.

TABLE 10

WHEAT REQUIREMENTS IN FOREIGN COUNTRIES[a]

Angola	80% soft, 20% hard--all imported
Austria	Hard, high protein, strong gluten
Belgium	High quality hard winter
Brazil	High quality durum; HRW
Burma	White
Ceylon	Wheat flour
Columbia	High quality durum; No. 1 HRW, 13% protein
Dominican Republic	High quality durum
Ecuador	No. 1 HRW, minimum 13% protein
El Salvador	Hard winter and spring
Finland	Hard, high protein, strong gluten
French West Africa	Bulgor
Ghana	High quality wheat flour
Greece	Hard, high protein, strong gluten
Guatemala	Hard wheat; durum
Haiti	High quality durum
India	Strong preference for white; hard red winter (less than 13% moisture)
Italy	Durum, hard winter
Japan	Government policy favors U. S. hard; bakers' requirement is soft or lower grade wheat for noodles
Kenya	Strong gluten
Korea	Soft white
Mozambique	Hard
Netherlands	Recleaned hard winter
Nicaragua	High quality durum
Nigeria	High quality wheat flour
Pakistan	Bulgor
Peru	No. 1 hard winter, 12-14% protein (uniform gluten strength)
Phillippines	Dark northern spring; would like 16-17% protein wheat
Spain	11% protein
Switzerland	Hard winter (low absorption)
Thailand	Wheat flour
United Kingdom	Hard
Uruguay	Hard winter
Venezuela	Durum
Central and South America	Hard wheat to blend with domestic soft wheat

[a]Leonard Schruben, "Quality of Hard Red Winter Wheat in Relation to Marketing and Production Efficiency," Proceedings, Ninth Hard Red Winter Wheat Workers Conference, Univ. of Nebr., January 16-18, 1962.

CHAPTER IV

ANALYSIS OF THE EXPORT SUBSIDY PROGRAM FOR WHEAT

The term, subsidy, is widely used and appears to refer to different types of aid depending on the industry or group of persons with whom it is associated. Yet the general implication denotes the use of public money to aid or promote a private undertaking which is deemed to be in the public interest. The wheat subsidy program was developed to aid in the disposal of surplus wheat stocks, an undertaking which decreases storage and other carryover costs associated with surplus stocks.

A government subsidy is required to export U. S. wheat in order that it may be sold on a competitive basis in foreign markets. It will be recalled from the previous chapter that price support programs have served to protect wheat prices for American farmers. These supports have resulted in high domestic wheat prices--prices generally higher than those on the world market. One study of wheat exports has stated:

> Due to price support programs, the domestic price of U. S. wheat is about 25% above the price of wheat in the world markets. U. S. wheat would therefore not sell in a foreign market at a price equal to the U. S. domestic price plus the ocean freight of transporting the wheat

to the foreign market.[44]

Thus, various subsidies have been developed to move wheat into export markets at competitive world or international prices.

U. S. governmental programs for expanding exports of wheat (and other commodities) may be grouped into two main categories: (1) surplus disposal programs such as Public Law 480 through which wheat grants, donations, loans, barter, and sales for soft currencies are made to foreign countries; and (2) direct subsidies of payments in kind to commercial exporters.[45] The payment in kind is made in the form of a certificate which allows the exporter to draw on Commodity Credit Corporation wheat stocks. This second form of government program, the direct subsidy, is the one with which this chapter is concerned.

Before 1954, wheat was the only grain commodity to be subsidized for export.[46] This subsidy worked within the framework of the International Wheat Agreement. In 1954, the USDA developed an export subsidy for feed grains. In 1956, a wheat export subsidy program was inaugurated which required wheat for most exports to be drawn from private rather than from CCC stocks.[47] Payments to exporters were changed from

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[44]James F. Mahar and John S. Gilmore, Analysis of Wheat Subsidies: The Export of Great Plains Wheat, Denver Research Institute, University of Denver (March, 1961), p. 19.

[45]Raymond F. Mikesell, Agricultural Surpluses and Export Policy (Washington, D. C.: American Enterprise Association, February, 1958), p. 32.

[46]Ibid., p. 17.

[47]Wheat Situation, (No. 180, August, 1962), p. 7.

cash to payments in wheat. This program is still in effect.

The subsidy paid to exporters is basically the difference between the domestic price at the relevant export location and the price as determined by the international market. The instrument of subsidy payment is the wheat certificate. The value of the certificate is calculated by multiplying the number of bushels exported times an export payment rate which the CCC determines to be applicable to the exportation. The certificates are transferable and the wheat redeemed by them must also be exported.[48]

Determination of an Export Subsidy Rate

How is the subsidy or export payment rate calculated? Factors considered in setting the daily rate include (1) type of wheat, (2) port location, (3) domestic cash price at that port, (4) a selected foreign market, (5) shipping charges to that market, and (6) the wheat price of the chief competitor in the foreign market.[49]

To illustrate, consider the Gulf port of Galveston as the selected port and the domestic cash price of ordinary hard red winter wheat in store at Galveston is $2.30 per bushel. Suppose further that the European market is selected as the foreign market. The Antwerp-Rotterdam market may be considered as representative of the European market for this example.

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[48]Mahar and Gilmore, op. cit., p. 23.

[49]Mahar and Gilmore, op. cit., pp. 19-21.

The delivered price of U. S. wheat must be in line with the price of its chief competitor which in this case might be Manitoba No. 3, a Canadian wheat. Suppose the price of Canadian wheat delivered to Antwerp-Rotterdam is $2.00 per bushel. Assume that the USDA believes the delivered price of ordinary hard red winter should be $1.90 per bushel or $0.10 under Manitoba No. 3. If the ocean freight from Galveston to Antwerp-Rotterdam on this particular day is $0.15 per bushel, the U. S. must export wheat at a price of $1.90 - $0.15 or $1.75 per bushel (delivered price less shipping charges).

To obtain the desired export price of $1.75 at Galveston, the subsidy or export payment rate must reduce the domestic price of $2.30 by $0.55. Thus, the subsidy rate for this port on the particular day is determined to be 55 cents per bushel.

In following the general development of an export subsidy rate the following price relationships are considered:[50]

Cash price - subsidy = export price

Export price + shipping charges = delivered price.

Effects of the Subsidy Program on Great Plains Wheat

Today the same subsidy generally exists for HRW wheat at West Coast ports, Gulf ports, East Coast ports, Great Lakes ports, and St. Lawrence River ports. The HRW subsidy for all

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[50]Mahar and Gilmore, op. cit., p. 21.

these areas is determined at Galveston which is representative of all Gulf ports. The Gulf is the principal area for the export of HRW wheat. In 1957-58, for example, approximately 75 per cent of exported HRW wheat was shipped from Gulf ports.[51]

Much the same procedure is followed in setting subsidy rates for the other classes of wheat as was shown for HRW. Practically all hard red spring wheat moves through either Minneapolis or Duluth to the Gulf, Atlantic, and Lake ports. The same HRS subsidy rate generally applies to each of these ports. For approximately the past five years, both HRW and SRW wheats have had the same subsidy rate at the Gulf, Atlantic, and Lake ports.[52] This subsidy equality allows the free market to act as a rationing agent in the utilization of hard red winter and soft red winter wheats.

Table 11 indicates export payment rates for the past several years. As is shown, hard and soft winters generally receive the same subsidy rate. The subsidy is the same for any HRW wheat regardless of its origin. This blanket treatment of HRW wheat subsidies encourages exporters to pull supplies from HRW wheat producing areas which have the lowest transportation costs to export markets. Great Plains wheat, because of its combination of high transportation rates and relatively high basic loan rates, will move to export markets

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[51] Mahar and Gilmore, op. cit., p. 29.

[52] Mahar and Gilmore, op. cit., p. 110.

TABLE 11

SELECTED MID-MONTH EXPORT SUBSIDY RATES ON WHEAT FOR IMMEDIATE SHIPMENT (1960 to 1963)[a]
(CENTS PER BUSHEL)

Date		East Coast			West Coast			Gulf to Europe			Gulf to Latin America		
		All classes	Spring	Durum	All classes	Hard	Spring	All classes	Spring	Durum	All classes	Spring	Durum
1960	Jan. 15	59	67		50			59	67		56	64	
	Feb. 15	64	74		52			64	74		60	71	
	Mar. 15	68	73		52			68	73		65	70	
	Apr. 15	67	75		58			67	75		64	72	
	May 15	53	66		53			53	66		50	63	
	June 15	40	65		47			40	65		37	62	
	July 15	41	62		42			41	62		38	59	
	Aug. 15	45	50		42			45	50		42	47	
	Sept. 15	51	51		46			51	51		48	48	
	Oct. 15	52	53		49			52	53		49	50	
	Nov. 15	52	56		50	52	50	52	56		49	53	
	Dec. 15	54	65		53	54	54	54	65		51	62	
1961	Jan. 15	57	64		53	57	53	57	64		54	61	
	Feb. 15	60	63	64	53			60	63	64	57	60	64
	Mar. 15	58	65	67	56			58	65	67	55	62	67
	Apr. 15	47	63	64	52			47	63	64	44	60	64
	May 15	44	59	48	53			44	59	48	41	56	48
	June 15	42	62	39	43	53		42	62	39	39	59	39
	July 15	44	68		44	45		44	68		41	65	
	Aug. 15	54	62		52	44		54	62		51	59	
	Sept. 15	54	61		54	44		54	61		53	58	
	Oct. 15	53	62		54	45		53	62		50	59	
	Nov. 15	54	63		53	40		54	63		51	60	
	Dec. 15	56	72		49	41		56	72		54	70	
1962	Jan. 15	56	74		43	45		56	73		54	71	
	Feb. 15	56	74		44	46		57	73		56	72	
	Mar. 15	59	74		45	49		59	74		58	73	
	Apr. 15	61	72		50	50		61	72		61	72	
	May 15	63	67		53	50		63	67		63	67	
	June 15	62	68		53	50	68	62	68		62	68	
	July 15	64	68		54	62	68	64	68		64	68	
	Aug. 15	59	62		52	64	62	59	62		59	62	
	Sept. 15	60	64		51	68	64	60	64		60	64	
	Oct. 15	60	66		50	69	66	60	66		60	66	
	Nov. 15	63	72	25	52	61	72	63	72	25	63	72	25
	Dec. 15	68	74	33	53	67	74	68	74	33	68	74	33

[a]Kansas City Grain Market Review, Kansas City Board of Trade, 1960-1963.

only after available supplies are removed from locations having lower transportation costs.

HRW wheat grown in Texas, Oklahoma, Eastern Kansas, Eastern Nebraska, Iowa, Missouri, and Illinois will be drawn to the Gulf export markets as long as such wheat satisfies the federal grade specified in the exporter's contract. But the federal grade does not truly categorize a wheat's quality in use. The federal grade involves strictly physical measurements. No mention is made of the many factors used by domestic millers and bakers to determine a wheat's milling and baking quality. The domestic trade has long recognized the wide variation in milling and baking quality within a given federal grade. It is almost universally agreed that the hard winter wheats produced in the Mississippi and Missouri River Basins, as well as wheats of Eastern Oklahoma, Kansas, and Nebraska, are of inferior bread-baking quality. Yet they may meet the same federal grade as will wheats of the Great Plains. Consequently, these Basin regions provide the initial source of HRW wheat for Gulf export. So the quality of HRW wheat exports varies from the very weak hard and semi-hard wheats grown in Illinois and Missouri to the strong wheats of the High Plains (centered around Western Kansas, Oklahoma, Nebraska, and Eastern Colorado). The wide quality variations in HRW wheat are due primarily to the climatic variations over the large area in which this wheat is grown.

A wheat's breadbaking quality is reflected in the

subsidy rate only in so far as the federal grade indicates quality. And federal grades have been proven to be poor measurements of quality. It can be readily seen that the existing basis of levying subsidy rates is not satisfactorily directing high quality wheat into export channels. In fact, the subsidy program encourages exports of wheats with widely varying quality.

The existing export situation has prompted Loren Johnson, executive vice president, Continental Grain Co., to state that the export price of U. S. wheat has been too high to clear away available supplies, and too high to enable potential buyers to act through commercial channels.

> To understand this, it is necessary to realize that the price discount for No. 2 hard winter for export is considerably less than the spread between our own milling spring wheats and ordinary hard winters in domestic markets. A close look at prices on a recent date reveals that No. 1 hard winter was selling in Kansas City at about $2.19 to $2.20 bu., and No. 1 dark northern spring, 14% protein, was selling at $2.50 bu. in Minneapolis. The latter grade compares favorably to No. 3 Northern Manitoba, so it is apparent that our milling industry is paying $11 per ton premium for the 14% protein spring wheat over hard wheat. We are trying to compete abroad with hard winters at a discount of $5 to $6 per ton under No. 3 Northern Manitoba.
>
> This comparison sheds light on why it is difficult to sell in dollar markets. Conversely, it illustrates why our better qualities are not being exported. At present subsidy levels, our better qualities are priced above Manitoba wheats.[53]

Thus, the current export subsidy program has led to a situation which seemingly contradicts efforts of commercial

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[53]Loren W. Johnson, "What is the Exporter's Role?," The Northwestern Miller, November 26, 1962, p. 38.

market development workers. As any miller knows, uniformity of product is one of his strongest sales points. The same principle should hold true when one is attempting to develop future cash export markets. Unless the United States develops an export program which more adequately promotes wheat quality the future world commercial market appears dim. Thus, the director of the Grain Division, Agricultural Marketing Service, has stated:

> We are facing an increasingly competitive market in international commerce. Unless we are willing to accept a demoralized market for grain, it is necessary by one means or another to maintain or increase this demand for U. S. grain in foreign countries. It may be a painful process, but the facts seem to require that we make available for delivery to foreign countries grain of better quality at lower prices than we do today.[54]

With a constant subsidy rate applying to all HRW wheat, the domestic prices at Gulf ports of wheats from various origins are reduced by a constant amount. The prices still have the same relationships as were previously shown in Table 8. Great Plains wheat is still priced at a disadvantage to hard red spring wheat. Table 11 illustrates the relative subsidy rates for HRW and HRS wheats. HRS subsidy rates have been almost always above HRW rates. For example, Table 11 shows that on June 15, 1960, the subsidy on HRS wheat exceeded that on HRW by 25 cents per bushel. On January 15, 1962, the HRS subsidy rate was 17 cents above the HRW rate. Clearly

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[54] W. A. Davidson, "Needed Improvements in Grain Marketing and How the States and USDA can Cooperate in Bringing Them About," Paper presented at the National Marketing Service Workshop, Louisville, Kentucky, November 27-29, 1962.

these examples show the extra premiums paid to move HRS wheat into export markets. If HRW wheat of comparable quality received the same treatment as HRS, the utilization of Great Plains-produced wheat could be materially increased.

But with the subsidy program based entirely on wheat classes and ignoring quality variations within those classes, superior quality HRW wheat of the Great Plains region is likely to remain largely inaccessible to commercial exporters. Without access to better quality wheat, foreign market development workers will find it increasingly more difficult to compete with high quality wheats of other exporting countries.

Because of the combined results of the price support program, transportation structure, and subsidy rate levels, Great Plains wheat is attracted more to the Kansas City domestic market. This tendency is even more pronounced for wheat of premium protein as is shown in Table 12.

TABLE 12

COMPARISON OF PROTEIN PREMIUMS OF HARD WINTER WHEAT AT THE GULF AND KANSAS CITY (MAY 29, 1963) (CENTS PER BUSHEL)

Per cent Protein	12	13	14
Gulf Protein Premium[a]	3	7	12
Kansas City Premium[b]	5½-10½	9½-16½	13½-22½

[a]Data obtained from Grain Division, Agricultural Marketing Service, USDA; and Grain Market News, Grain Division, AMS, USDA, May 31, 1963.

[b]Kansas City Grain Market Review, Kansas City Board of Trade, May 29, 1963.

The Gulf premium shown in Table 12 is a rough approximation of the European premium schedule for protein. Table 12 shows the Kansas City premium schedule exceeds that at the Gulf. It is also evident that the Kansas City premium varies for a given percentage of protein. This reflects the recognition by the domestic grain trade of the large variation in baking quality for HRW wheat of a given protein content.[55] The federal grading system, the price support structure, and the export subsidy program do not recognize this performance variation. Table 12 does point out the difficulty of diverting superior quality HRW wheat into the export market when this market fails to pay a domestic premium scale for quality as measured by protein or sedimentation. Since subsidy rates pay no premium for quality, there is little incentive for exporters to ship higher priced Great Plains wheat. So the tendency of Great Plains wheat to be diverted to carryover has not been remedied by existing levels of export subsidies.

For HRW wheats of Missouri, Illinois, etc., the subsidy rate has been sufficient to lower domestic prices to a competitive export market level as evidenced by the lack of carryover stocks in these regions. But for higher quality Great Plains wheat having higher transportation costs to the Gulf, the subsidy rates have not been sufficient to lower prices to a level which proves attractive to the world market.

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[55]Mahar and Gilmore, op. cit., p. 36.

CHAPTER V

POSSIBLE EFFECTS OF NEW MILLING TECHNIQUES ON WHEAT UTILIZATION

The recent development of two new milling procedures, fine grinding and air classification of flour, has been a subject of widespread interest within the flour milling industry. Several companies have installed impact grinders and air classifiers, however, an aura of secrecy surrounds the results of their operations.[56] This has led to much speculation as to possible effects on a miller's wheat selection problem.

Nevertheless, enough research work has been performed by manufacturers of this new equipment and by research facilities of the USDA to provide an insight into the general results of the new techniques. Fine grinding uses an impact mill to further reduce the particle size of flour as it leaves the conventional milling process. This reground flour is then subjected to an air classifier which separates the particles on the basis of their size into a variable number of fractions.

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[56] Austin T. Drake, "Flour Refining Techniques," The Northwestern Miller, August 22, 1960, p. 26.

Effects on Utilization of Great Plains Wheat

The important aspect of this milling technique is its ability to shift the protein content of flours. The flour fractions show marked variations in their protein-starch composition. Thus, from a single wheat, impact milling and air classification can produce (1) a high-protein fraction, (2) a high-starch fraction, and (3) an intermediate fraction.

The number of flour fractions which can actually be produced are almost limitless, but practical considerations tend to limit the fractions to those mentioned. The relative composition and amount of these flour fractions varies with the type of wheat used. By recombining these fractions the flour miller can greatly increase his versatility in providing a finished flour to the baker. At the same time, he has greater control over the level of protein in the flour as well as flour particle size.[57]

The executive vice-president of Peavey Company Flour Mills has summarized the advantages and disadvantages of fine grinding and air classification, a process which Peavey Mills refers to as "Orbit" milling.

> With this system, flours are separated by air classification and certain streams are ground by impact rather than on conventional rolls. Some of the ground fractions may be further classified. The resulting flours have properties which make them particularly suited for cake

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[57] Kenneth Majors and Warren Trotter, "New Research Developments in the Marketing of Grain," New Methods and Tools for Improving Agricultural Marketing, Agricultural Marketing Service, USDA (July, 1961), pp. 143-145.

> baking or bread baking since Orbit milling frees them from flour fractions which are not suited to specialized baking purposes. Orbit milling also permits the miller more flexibility in wheat selection since uniform, high quality flours can be Orbit milled from wheats of more varying characteristics than is the case with conventional milling.
>
> The change from conventionally milled flours to air classified flours has been relatively slow because such changes did require the years of research and have necessitated large capital expenditures for new equipment.
>
> What the Orbit process does is to provide more unique flours by shifting the protein content to give more flexibility in the utilization of wheat supplies. For example, with the Orbit process we can now manufacture cake flour from hard wheat which we could not do before.[58]

There is a possibility that the air classification process could shift the flour milling industry back to the East where it was long ago centered.[59] Mills in the East could blend air classified flours from local SRW and HRW wheats with the high protein fraction flour of Great Plains HRW and HRS wheats. This could result in a bread flour suited for bakery production in populous consuming centers.

Only Great Plains hard wheats are generally suited to this type of flour production under current milling procedures. There are high transportation costs attached to moving this flour to the Eastern consuming centers. Under conventional milling systems, procurement and transportation costs can involve as much as 35 to 40 per cent of the delivered price of

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[58] "Expansion Study with Orbit Mill Success," The Southwestern Miller, April 16, 1963, p. 33.

[59] A. B. Ward, "Wheat Requirements by New Milling Processes," Proceedings: Ninth Hard Red Winter Wheat Workers Conference, Agricultural Experiment Station, University of Nebraska (Gr-40, 1962), pp. 49-52.

bakery flour.[60] Using air classified flours, only the high protein fractions from strong Great Plains wheats would be required for blending with Eastern wheats. The high protein fractions would stretch a long way when being blended with weaker wheats of the East. The resulting blend would still have good bread baking qualities and would have much lower transportation charges involved than would whole flour shipped from the Great Plains. This could put the Great Plains region at a comparative disadvantage in supplying bakery flour to the Eastern Seaboard.

Great Plains wheat would be required only in volumes which would provide the high protein fraction of a flour blend consisting primarily of air classified flours from Eastern SRW and HRW wheats. Thus, the Peavey Mills representative, in the above quote, did not discuss all the factors concerning utilization of wheats. Not only can cake flour be manufactured from hard wheat, but millers can use Eastern semi-hard and soft wheats to produce bread flour. And with a limited amount of high protein flour, soft wheat flours might be blended to yield a bread flour which could be delivered to Eastern bakeries at a lower cost than bread flours originating in the Great Plains. Such a trend in wheat utilization would have discouraging implications for Great Plains wheat producers.

As is recognized, much of this section involves a

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[60]Majors and Trotter, loc. cit.

degree of conjecture as to the possible effects of new milling techniques on the utilization of Great Plains wheats. There are several reasons why the possibilities discussed in this section will not occur for several years, if even then. The new milling procedures are still much in the research and development stage and only a few of the large milling companies have installed new machinery. A second major reason lies in the capital expenditures necessary to purchase and install the necessary equipment. With flour milling operations on a historically low margin, mill management is hesitant to invest large sums of money into a relatively unproven process.

A third major factor accounting for the slow application of this new technique involves the disposal of the low protein fractions which result from air classification of flour. It is conceivable that the high protein flour fractions will be in high demand for blending purposes and, as a result, will command a sizeable premium. The intermediate protein fractions are seemingly suited to cake flours. The remaining fraction, having as low as 3 per cent protein, is not adapted to any widespread food use.[61] Consequently, this fraction must compete for industrial applications with other products--products which may be more economical.

Hence, the widespread use of impact mills and air

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[61] Eugene J. Gehrig, "Millers, Chemists, and Agronomists Probe Possible Air Classification Effects on Soft Wheat Market," American Miller and Processor, March, 1962, pp. 16-19.

classifiers depends on the ability of millers to dispose of all their products at prices which provide a profitable return. A miller's profit, however, is as dependent upon his ability to select the most economical wheat to mill as it is upon the milling process he uses. So regardless of his milling techniques, he still faces the problem of purchasing the most desirable milling wheat.

A Method of Determining Iso-Values of Wheats

As discussed above, new milling techniques make it relatively easy to substitute one kind of wheat for another. Wheats of widely varying characteristics can be milled to obtain a uniform product. However, different wheats will yield different proportions of products having different prices. By summing up the amount of each product multiplied by its price the milling value of a wheat may be determined. As would be expected, the milling values may vary considerably among various wheats.

A buyer for a flour mill is continually faced with the problem of buying wheat which will yield the most profit to his firm. The buyer is also interested in knowing at what prices other wheats become equally profitable to mill. The profit is determined from a wheat's milling value and its cost. To find the optimum of several wheats, the following assumptions are made:

1. Costs of the various wheats are known
2. Product distribution of each wheat is known
3. Prices of the products are known
4. A sufficient amount of each wheat is available to the miller.

Assume that, through pilot milling tests on each of the available wheats, the information as shown in Table 13 is determined.

TABLE 13

PRODUCT DISTRIBUTION AND VALUE OF FIVE HYPOTHETICAL WHEATS

Available Wheats		Product Distribution and Prices			
Wheat	Cost per cwt.	A @ 5.8¢ per lb.	B @ 5.0¢ per lb.	C @ 3.8¢ per lb.	D @ 1.7¢ per lb.
W_1	$3.32	75.48 lbs.	0.28 lbs.	0.49 lbs.	23.74 lbs.
W_2	3.36	71.12	1.06	2.78	25.04
W_3	3.20	55.26	8.35	2.70	33.69
W_4	3.53	63.54	6.19	1.13	29.14
W_5	3.26	53.03	7.96	1.09	37.92

By multiplying the amount of each product times its price and summing these values, the total milling value of each wheat can be obtained. The milling values of wheats 1 through 5 are shown in Table 14.

Net profits of each wheat can now be obtained by subtracting the cost of the wheat from its milling value. Net profits are shown in Table 15.

It is readily seen that W_1 is the most profitable of the five wheats. For W_2 to be equally profitable its cost must be lowered by $0.15 per cwt. Thus, the iso-value of W_2 would be a market price of $3.21 per cwt. In like manner the iso-values of the remaining wheats are found to be $2.80 for

TABLE 14

DETERMINATION OF MILLING VALUES OF FIVE HYPOTHETICAL WHEATS

Wheat	Product Value ($)				Milling Value per cwt.
	A	B	C	D	
W_1	4.378	.014	.019	.404	4.82
W_2	4.125	.053	.106	.426	4.71
W_3	3.205	.418	.103	.573	4.30
W_4	3.686	.309	.043	.495	4.53
W_5	3.076	.398	.041	.645	4.16

TABLE 15

COMPUTATION OF NET PROFITS OF FIVE HYPOTHETICAL WHEATS

Wheat	Milling Value - Cost	Net Profit per cwt.
W_1	$4.82 - $3.32	$1.50
W_2	4.71 - 3.36	1.35
W_3	4.30 - 3.20	1.10
W_4	4.53 - 3.53	1.00
W_5	4.16 - 3.26	.90

W_3, $3.03 for W_4, and $2.66 for W_5.

This procedure is highly simplified in relation to the realistic market. This method assumes that milling tests can be performed on each wheat, an assumption which proves to be practically impossible in view of the hundreds of wheats which a buyer must screen every day. Furthermore, exact knowledge

of product prices is assumed. Yet prices are continually fluctuating with each flour or millfeed sale made. Milling procedures are assumed to remain constant regardless of the wheat being milled. Yet a flour mill must change its tempering time, its roll settings, and make numerous other adjustments to insure the maximum yield from each wheat milled. Thus, a realistic model would require that these and probably other factors be taken into consideration.

Even though the outlined method is highly simplified, it illustrates the steps to be taken by a wheat buyer who is attempting to maximize the net return to his flour mill. This method characterizes the problem of purchasing the most desirable wheat for a milling firm regardless of whether the mill employs conventional techniques or is experimenting with the newer milling techniques.

SUMMARY AND CONCLUSIONS

In contrast to the many studies attempted on the general wheat problem, this study was undertaken primarily to analyze the problems involved in marketing a specific class of wheat, hard red winter. This study has particular significance for Central and Southern Great Plains wheat farmers because they are easily the largest producers of hard red winter wheat. The problem is really reduced, then, to one of marketing wheat from the Great Plains area.

To illustrate that a marketing problem does exist, a section of this thesis has been devoted to reviewing production and carryover trends of all domestic wheat and trends of the individual wheat classes as well. The resulting figures indicate that decreasing wheat acreages have been largely offset by increased yields, thus, total production of wheat has been maintained at a rather steady level. In 1952, hard red winter wheat comprised about 38 per cent of total stocks but on July 1, 1962, this same class of wheat comprised approximately 82 per cent of total stocks. This represents over 93 per cent of the total wheat added to carryover in the last decade.

It was also indicated that the percentage of total wheat acreage devoted to hard red winter varieties has

steadily increased from 32 per cent in 1919 to 56.7 per cent in 1959. Thus, the relative increase in hard winter wheat carryover has materially exceeded that of the other wheat classes.

Primarily four major factors have been discussed to demonstrate their effects on hard red winter wheat marketing. These factors are (1) trends in HRW wheat production and yields, (2) the wheat transportation structure of the Great Plains, (3) price support programs, and (4) the wheat export subsidy program. The likely or possible effects of a fifth factor, new milling techniques, were also analyzed.

Approximate transportation rates, as tabled in the Appendix, show that one reason for hard winter wheat to be diverted into carryover is the high cost of moving wheat from the Great Plains to the Gulf for export. Because of their landlocked location, Great Plains wheat producers cannot receive the same benefit from low-cost water transportation as can areas of Missouri, Mississippi, and Ohio Basins. Consequently, they are primarily dependent upon rail movement. With rail rates on grain having nearly doubled since World War II, the resultant competitive position of Great Plains producers has deteriorated. An increase in the volume of trucked wheat is seen as a hope for increased carrier competition and a decrease in transportation rates from the Great Plains to both terminal markets and Gulf export points. The increase in truck-barge combination of moving wheat to the

Gulf has proved to be particularly competitive to rails' traffic.

However, it is unlikely that transportation rates alone have been responsible for the huge carryover stocks of hard red winter wheat. Wheat buyers, both domestic and foreign, attempt to buy the wheat which appears to them to be the best bargain, i. e., the lowest price wheat which satisfies their quality requirements. Thus, market demand for a given kind of wheat is determined by its relative price-quality relationship.

There is evidence to indicate that hard red winter wheat has been subjected to a guaranteed price support which is higher than cash markets deem appropriate. The basic county loan rates of the Great Plains areas, when combined with transportation rates to the Gulf, impart a delivered price of HRW wheat which export buyers often consider too high. Statements made by personnel of grain companies and the Grain Division of the Foreign Agricultural Service document this contention.

All too often grain exporters are able to buy hard winter wheat from the Central Plains region (Missouri, Illinois, Iowa, etc.) at a price which is more competitive on the world market. This is a result of the combination of high freight rates from the Great Plains coupled with the relatively high basic loan rates of counties in the region. Because of the high freight charges the local cash market price of wheat in the Great Plains falls below the effective support level.

Consequently, a large carryover has been developing in this region in the last decade.

The method by which a county's support level is determined has been tied to the historic movement of wheat from the West to the consuming areas of the East. However, with more wheat now being exported than consumed domestically, the existing method of price support determination has become outdated. The possibilities of determining county loan rates based on the Gulf export market and on transportation charges to that market should be studied. This could result in a loan rate which more correctly evaluates the market price of Great Plains wheat. Unless some corrective change is made, carryovers of Plains wheat are likely to continue.

On the other hand hard winter wheat of the Central Plains has found a ready market at the Gulf because of its ability to meet the federal grade stated in the exporter's contract and because of its access to economical water transportation. This wheat is recognized to be inferior in bread-baking quality to that of the Great Plains, yet its price is more attractive to the buyer.

The usual reason cited for the Great Plains wheat carryover is that of excess production. But an equally important, if not more basic, reason may well be that price supports have been set at a level higher than is warranted by the existing quality of wheat being produced on the Great Plains when wheat from this area is compared with that produced in

other areas.

The domestic price of U. S. wheat is supported at a level higher than that of the world price of wheat. Therefore, domestic wheat must receive an export subsidy to be competitive on the world market. Development of the export program has ignored quality variations within wheats of a given class with the result that all hard red winter wheat receives the same subsidy rate. Under these circumstances the export prices of hard winter wheats from different production areas bear the same relationship to each other as do domestic prices. The export program merely lowers the price of each wheat by the amount of the subsidy price.

The subsidy does not provide sufficient incentive for exporters to draw wheat from the Great Plains. As long as they receive the same subsidy on Central Plains hard winter wheat they will draw supplies from this region first. Only after the available supplies are depleted in these low cost transportation regions will they direct their attention to stocks on the Great Plains.

The combination of loan rates and transportation costs have increased the delivered cost of Great Plains wheat relatively more than that of wheat from the Central Plains. Yet a uniform subsidy does nothing to relieve this price inequality. It merely lowers the delivered costs by the same amount. This is the manner in which the higher quality Great Plains wheat must compete for export markets.

Past experience indicates that the price of better quality U. S. wheat is too high. It is likely to remain too high unless steps are taken to adjust one or all of the discussed factors affecting the marketing of Great Plains wheat.

The effects which new milling techniques may have on the utilization of Great Plains wheat remain somewhat obscured. An aura of secrecy surrounds much of the experimental and research work being done by milling companies. Yet some general information is available about the operation and initial results of impact milling and air classification procedures.

Because this procedure is used by a relatively few mills at present and is still primarily in the research stage, no conclusions about its effect on wheat utilization can be definitely determined. Yet it is known that certain fractions of hard wheat flours can be used as satisfactory cake flour. Only soft wheats were formerly suited to the production of cake flours. At the same time, the new milling techniques make it possible to produce bread flours from certain fractions of soft wheat flour.

In populous centers of the East where soft wheats are grown the new techniques may encourage the substitution of soft wheats for hard wheats to produce bread flours. If this substitution proves technologically feasible on a wide scale, it could have economic savings. Presently bread flours are milled from hard wheats of the Great Plains. To deliver this flour to the East can involve as much as 35 to 40 per cent of

the delivered price of flour. By using local soft wheats, Eastern millers could circumvent much of the transportation charge and could gain a competitive advantage in supplying bakery flour. The demand for Great Plains wheat to supply these Eastern bakeries would be correspondingly reduced.

Little is known about the feasibility of such a development. Nevertheless it is a possibility which has become apparent with the rapid development of air classified flours. If such a situation should occur, the export market would become of increased relative importance to Great Plains producers.

It seems that Great Plains producers and their representatives should familiarize themselves with factors which affect the marketing of their wheat. Unless adjustments are made in the outlined factors, a large HRW wheat carryover is likely to be maintained or increased. Unnecessarily large carryovers are meeting with increased disfavor on the part of national planners. Unless a more effective marketing channel is implemented, Great Plains wheat farmers will lose much of their wheat acreage and will be the long-run victims of their own production efficiency.

BIBLIOGRAPHY

Books

Locklin, D. P. Economics of Transportation. Homewood, Illinois: Richard D. Irwin, Inc., 1960.

Pyler, E. J. Baking Science and Technology. 2 vols. Chicago: Siebel Publishing Co., 1952.

Articles and Periodicals

Dahl, Reynold P. "Classes of Wheat and the Surplus Problem," The Northwestern Miller, CCLXVI, No. 8 (April 16, 1962), 30-34.

Drake, Austin T. "Flour Refining Techniques," The Northwestern Miller, CCLXIV, No. 4 (August 22, 1960), 26-28.

"Expansion Study with Orbit Mill Success," The Southwestern Miller, XLII, No. 7 (April 16, 1963), 33.

Gehrig, Eugene J. "Millers, Chemists, and Agronomists Probe Possible Air Classification Effects on Soft Wheat Market," American Miller and Processor, XC, No. 3 (March, 1962), 16-19.

Johnson, Loren W. "What is the Exporter's Role?," The Northwestern Miller, CCLXVII, No. 11 (November 26, 1962), 38-44.

Schnittker, John A. "Wheat and Farm Policy," American Economic Review, LI, No. 2 (May, 1961), 352-360.

Turnbull, Roderick. "In the Grain Trade," The Kansas City Star, 1962-1963.

Government and State Publications

Manning, T. W., and R. J. Doll. The Wheat Adjustment Problem, Federal Reserve Bank of Kansas City, November, 1961.

Nauheim, Charles W., Warren R. Bailey, and Della E. Merrick. Wheat Production: Trends-Problems-Programs-Opportunities for Adjustment, Agricultural Research Service, U. S. Department of Agriculture Bulletin No. 179, March, 1958.

Schnittker, John A. Wheat Problems and Programs in the United States, University of Missouri Agricultural Experiment Station Research Bulletin 753, September, 1960.

Shepherd, Geoffrey. Appraisal of the Federal Feed-Grains Programs, Iowa State University Agricultural and Home Economics Experiment Station Research Bulletin 501, January, 1962.

United States Department of Agriculture. Grain Transportation in the North Central Region, USDA Bulletin 490, July, 1961.

United States Department of Agriculture. Marketing and Transportation Situation, Economic Research Service Report MTS-147, November, 1962.

United States Department of Agriculture. New Methods and Tools for Improving Agricultural Marketing, Agricultural Marketing Service Bulletin 448, July, 1961.

United States Department of Agriculture. Price Programs, USDA Bulletin 135, April, 1957.

United States Department of Agriculture. Wheat Situation, Economic Research Service Reports WS-171 to WS-183.

University of Nebraska. Proceedings: Ninth Hard Red Winter Wheat Workers Conference, University of Nebraska Agricultural Experiment Station Report CR-40, January, 1962.

Reports

Mahar, James F., and John S. Gilmore. Analysis of Wheat Subsidies: The Export of Great Plains Wheat. A Report Prepared for Great Plains Wheat, Inc. by Denver Research Institute, University of Denver, March, 1961.

Mikesell, Raymond F. Agricultural Surpluses and Export Policy. Washington, D. C.: American Enterprise Association, February, 1958.

Unpublished Material

Davidson, W. A. "Needed Improvements in Grain Marketing and How the States and USDA can Cooperate in Bringing Them About." Paper presented at the National Marketing Service Workshop, Louisville, Kentucky, November 28, 1962.

Russell, Dudley. "The Demand for Wheat by Classes." Paper presented at the Marketing Seminar, Minneapolis Grain Exchange, August 28, 1961.

Thompson, W. H. "Cross Currents in Transportation." Paper presented at the Grain and Feed Management Conference, Manhattan, Kansas, November 28, 1962.

Other Sources

Bartlett and Company, Kansas City, Missouri. Personal interview with Oren Miller. December 29, 1962.

Farmers Union Cooperative Marketing Association, Kansas City, Missouri. Personal interview with Ralph White, Traffic Manager. July 17, 1962.

Farris Trucking Company, St. Joseph, Missouri. Personal interview with Gennie Farris. November 20, 1962.

Kansas City Board of Trade. Kansas City Grain Market Review. 1960-1961.

Kansas City Board of Trade. Personal interview with Joe Lynch, Transportation Consultant. July 18, 1962.

Kansas City CED Associates Center. The Wheat Situation in the United States. Kansas City, Missouri, April, 1962.

Kansas City Commodity Office. Personal interviews with Lester Bloyd, Traffic Chief. July, 1962.

Kansas Motor Carriers Association, Topeka, Kansas. Personal interview with George Hutchins, Tariff Manager. June 7, 1963.

APPENDIX

TABLE 1

WHEAT TRUCK AND RAIL TRANSPORTATION COSTS FROM KANSAS COUNTIES TO SELECTED EXPORT AND DOMESTIC MARKETS
(Cents per hundredweight)

County	Rail rate to--[a]				Truck rate to--[b]	
	K.C.	Gulf	Chic.	W.C.	K.C.	Gal.
Allen	--	58	53½	82	14	50
Anderson	--	58	53½	82	12	52
Atchison	--	58	53½	82	10	55
Barber	--	--	65½	78	25	50
Barton	38	--	65½	78	20	52
Bourbon	--	58	53½	82	14	50
Brown	--	58	53½	82	10	55
Butler	34	58	61½	82	18	50
Chase	--	58	58	82	15	52
Chautauqua	--	53½	58	82	18	50
Cherokee	--	53½	54½	82	16	50
Cheyenne	46	70	73½	70	30	55
Clark	--	60	72	74	28	50
Clay	--	58	60	82	14	55
Cloud	34	58	61½	82	15	55
Coffey	--	58	53½	82	12	52
Comanche	--	60	70	78	28	50
Cowley	--	53½	61½	82	20	50
Crawford	--	55	53½	82	14	50
Decatur	41	66½	70	74	25	55
Dickinson	34	58	61½	82	14	55
Doniphan	--	58	53½	82	10	55
Douglas	--	58	53½	82	10	55
Edwards	38½	62	65½	78	25	52
Elk	--	55	57½	82	18	50
Ellis	38	62	65½	78	25	55
Ellsworth	35½	59½	63	81	18	55
Finney	44½	68½	72	74	31	50
Ford	39	63	66½	74	28	50
Franklin	--	58	53½	82	10	55
Geary	--	58	58	82	13	55
Gove	42½	66½	70	74	31	55
Graham	39	63	66½	76	25	55
Grant	--	68	73½	70	34	50
Gray	--	64	70	74	31	50
Greeley	46	70	73½	70	34	52
Greenwood	--	58	57½	82	16	50
Hamilton	46	70	73½	70	34	50
Harper	--	53½	63½	81	22	50
Harvey	34	58	61½	81	17	52

TABLE 1--Continued

County	Rail rate to--[a]				Truck rate to--[b]	
	K.C.	Gulf	Chic.	W.C.	K.C.	Gal.
Haskell	--	62	72	74	34	50
Hodgeman	39	63	66½	74	28	52
Jackson	--	58	53½	82	10	55
Jefferson	--	58	53½	82	10	55
Jewell	34	58	62	82	18	55
Johnson	--	58	53½	82	10	55
Kearny	46	70	73½	70	34	50
Kingman	--	59½	63	81	20	50
Kiowa	--	62	65½	78	25	50
Labette	--	53½	54½	82	16	50
Lane	42½	66½	70	74	31	52
Leavenworth	--	58	53½	82	10	55
Lincoln	35½	59½	63	81	18	55
Linn	--	58	53½	82	12	52
Logan	44½	68½	72	74	34	55
Lyon	--	58	54½	82	14	52
McPherson	35½	59½	63	81	17	52
Marion	34	58	61½	82	15	52
Marshall	--	58	53½	82	13	55
Meade	--	59	72	74	31	50
Miami	--	58	53½	82	10	55
Mitchell	34½	58	62	82	18	55
Montgomery	--	53½	54½	82	16	50
Morris	--	58	57½	82	14	55
Morton	--	61	78	70	34	50
Nemaha	--	58	53½	82	10	55
Neosho	--	58	53½	82	14	50
Ness	39	63	66½	74	28	52
Norton	38	63	65½	78	22	55
Osage	--	58	53½	82	10	55
Osborne	35½	59½	63	81	18	55
Ottawa	34	58	61½	82	15	55
Pawnee	38	62	65½	78	25	52
Phillips	38	62	65½	78	20	55
Pottawatomie	--	58	53½	82	13	55
Pratt	38	62	65½	78	22	50
Rawlins	44½	68½	72	74	30	55
Reno	35½	59½	63	81	18	52
Republic	34	58	61½	82	15	55
Rice	--	59½	63	81	18	52
Riley	--	58	54½	82	13	55
Rooks	38	62	65½	78	22	55
Rush	38	62	65½	78	25	52
Russell	38	62	64	79	20	55
Saline	34	58	61½	82	15	55

TABLE 1--Continued

County	Rail rate to--[a]				Truck rate to--[b]	
	K.C.	Gulf	Chic.	W.C.	K.C.	Gal.
Scott	44½	68½	72	74	34	52
Sedgwick	34	58	61½	81	18	50
Seward	--	56	75½	73	34	50
Shawnee	--	58	53½	82	10	55
Sheridan	42½	66½	70	74	28	55
Sherman	46	70	73½	70	32	55
Smith	35½	59½	63	81	18	55
Stafford	38	62	65½	78	20	52
Stanton	--	68	75½	70	34	50
Stevens	--	59	75½	70	34	50
Sumner	--	53½	61½	81	20	55
Thomas	44½	68½	72	74	32	55
Trego	39	63	66½	74	28	55
Wabaunsee	--	58	54½	82	13	55
Wallace	46	70	73½	70	34	55
Washington	--	58	58	82	14	55
Wichita	46	70	73½	70	34	52
Wilson	--	58	54½	82	14	50
Woodson	--	58	53½	82	14	50
Wyandotte	--	58	53½	82	10	55

[a]These rates are provided on an approximate basis and therefore are not for publication.

[b]Lowest rate in county having different rates to Galveston and New Orleans.

TABLE 2

WHEAT TRUCK AND RAIL TRANSPORTATION COSTS FROM OKLAHOMA COUNTIES TO SELECTED EXPORT AND DOMESTIC MARKETS
(Cents per hundredweight)

County	Rail rate to--[a]			Truck rate[b] to Galveston
	K.C.	Gal.	Chic.	
Adair	--	44½	--	41
Alfalfa	39	46½	66½	47
Atoka	52	44½	79½	33
Beaver	51	47½	78½	50
Beckham	56	44½	83½	38
Blaine	51	44½	78½	41
Bryan	60½	44½	88	33
Caddo	54½	44½	82	38
Canadian	51	44½	78½	38
Carter	56	44½	83½	33
Cherokee	--	44½	--	41
Choctaw	57½	44½	85	33
Cimarron	54½	47½	82	50
Cleveland	52	44½	79½	38
Coal	52	44½	79½	35
Comanche	56	44½	83½	35
Cotton	57½	44½	85	33
Craig	30½	47	58	47
Creek	40	44½	67½	41
Custer	54½	44½	82	38
Delaware	--	44½	--	46
Dewey	54½	45½	82	41
Ellis	54½	47½	82	41
Garfield	39	44½	66½	46
Garvin	56	44½	83½	35
Grady	54½	44½	82	38
Grant	39	48	66½	47
Greer	57½	44½	85	35
Harmon	60½	44½	88	33
Harper	46½	50½	74	47
Haskell	43	44½	70½	38
Hughes	46½	44½	74	38
Jackson	57½	44½	85	33
Jefferson	57½	44½	85	33
Johnston	54½	44½	82	33
Kay	39	48½	66½	47
Kingfisher	46½	44½	74	41
Kiowa	56	44½	83½	35
Latimer	46½	44½	74	38
LeFlore	46½	44½	74	38

TABLE 2--Continued

County	Rail rate to--[a]			Truck rate[b] to Galveston
	K.C.	Gal.	Chic.	
Lincoln	46½	44½	74	41
Logan	46½	44½	74	41
Love	57½	44½	85	33
McClain	54½	44½	82	38
McCurtain	60½	44½	88	33
McIntosh	39½	44½	67	38
Major	48½	45½	76	47
Marshall	56	44½	83½	33
Mayes	32½	44½	60	46
Murray	56	44½	83½	33
Muskogee	38½	44½	66	41
Noble	39	44½	66½	46
Nowata	30½	50	58	47
Okfuskee	45	44½	72½	38
Oklahoma	51	44½	78½	38
Okmulgee	38½	44½	66	41
Osage	34	50	61½	47
Ottawa	27½	49	55	47
Pawnee	39	44½	66½	46
Payne	45	44½	72½	41
Pittsburg	46½	44½	74	38
Pontotoc	51	44½	78½	35
Pottawatomie	51	44½	78½	38
Pushmataha	54	44½	81½	33
Roger Mills	57½	45½	85	38
Rogers	32½	44½	60	46
Seminole	48½	44½	76	38
Sequoyah	39½	44½	67	41
Stephens	56	44½	83½	33
Texas	52	47½	79½	50
Tillman	60½	44½	88	33
Tulsa	34	44½	61½	46
Wagoner	34	44½	61½	41
Washington	27½	50	55	47
Washita	54½	44½	82	38
Woods	39	47½	66½	47
Woodward	51	47½	78½	47

[a]Rail rates obtained July, 1962, during personal interviews with Lester Bloyd, Traffic Chief, Kansas City Commodity Office.

[b]Truck rates are provided on an approximate basis and therefore are not for publication.

TABLE 3

WHEAT TRUCK AND RAIL TRANSPORTATION COSTS FROM COLORADO COUNTIES TO SELECTED EXPORT AND DOMESTIC MARKETS
(Cents per hundredweight)

County	Rail rate to--[a]					Truck rate to--[b]	
	Omaha	K.C.	Gal.	Chic.	W.C.	K.C.	Gal.
Adams	54	54	78	81½	70	37	--
Alamosa	--	--	--	--	--	--	--
Arapahoe	54	54	78	81½	70	37	--
Archuleta	--	--	--	--	--	--	--
Baca	55½	--	65	83	70	37	50
Bent	54	52	77	79½	70	37	50
Boulder	54	54	78	81½	70	--	--
Chaffee	--	--	--	--	--	--	--
Cheyenne	52½	50	75	77½	70	35	--
Clear Creek	--	--	--	--	--	--	--
Conejos	--	--	--	--	--	--	--
Costilla	--	54	94	81½	70	--	--
Crowley	54	54	78	81½	82	38	--
Custer	--	--	--	--	--	--	--
Delta	--	--	--	--	--	--	--
Denver	54	54	78	81½	70	--	--
Dolores	--	--	--	--	--	--	--
Douglas	54	54	78	81½	70	--	--
Eagle	--	--	--	--	--	--	--
Elbert	54	54	78	81½	70	38	--
El Paso	54	54	78	81½	70	38	--
Fremont	57	54	81	81½	70	--	--
Garfield	--	--	--	--	--	--	--
Gilpin	--	--	--	--	--	--	--
Grand	--	--	--	--	--	--	--
Gunnison	--	--	--	--	--	--	--
Hinsdale	--	--	--	--	--	--	--
Huerfano	54	54	78	81½	70	--	--
Jackson	--	--	--	--	--	--	--
Jefferson	54	54	78	81½	70	--	--
Kiowa	51	51	75	78½	82	37	--
Kit Carson	50	50	75	77½	82	33	--
Lake	--	--	--	--	--	--	--
LaPlata	--	--	--	--	--	--	--
Larimer	54	54	78	81½	70	--	--
Las Animas	--	--	78	--	70	39	50
Lincoln	54	54	78	81½	70	37	--
Logan	54	54	78	81½	70	37	--
Mesa	--	--	--	--	--	--	--
Mineral	--	--	--	--	--	--	--

TABLE 3--Continued

County	Rail rate to--[a]					Truck rate to--[b]	
	Omaha	K.C.	Gal.	Chic.	W.C.	K.C.	Gal.
Moffat	--	--	--	--	--	--	--
Montezuma	--	--	--	--	--	--	--
Montrose	--	--	--	--	--	--	--
Morgan	54	54	78	81½	70	37	--
Otero	54	54	78	81½	70	38	50
Ouray	--	--	--	--	--	--	--
Park	--	--	--	--	--	--	--
Phillips	50	50	72½	77½	99½	34	--
Pitkin	--	--	--	--	--	--	--
Prowers	49	49	74	76½	70	37	50
Pueblo	54	54	78	81½	70	38	--
Rio Blanco	--	--	--	--	--	--	--
Rio Grande	--	--	--	--	--	--	--
Routt	--	--	--	--	--	--	--
Saguache	--	--	--	--	--	--	--
San Juan	--	--	--	--	--	--	--
San Miguel	--	--	--	--	--	--	--
Sedgwick	50	51	77	78½	70	34	--
Summit	--	--	--	--	--	--	--
Teller	--	--	--	--	--	--	--
Washington	54	54	78	81½	99½	35	--
Weld	54	54	78	81½	99½	37	--
Yuma	51	51	75	78½	99½	33	--

[a]Rail rates obtained July, 1962, during personal interviews with Lester Bloyd, Traffic Chief, Kansas City Commodity Office.

[b]Truck rates are provided on an approximate basis and therefore are not for publication.

TABLE 4

WHEAT TRUCK AND RAIL TRANSPORTATION COSTS FROM NEBRASKA COUNTIES TO SELECTED EXPORT AND DOMESTIC MARKETS
(Cents per hundredweight)

County	Rail rate to--[a]				Truck rate[b] to Kansas City
	Omaha	Gulf	W.C.	Chic.	
Adams	30½	60	81	58	20
Antelope	29	78½	99½	57	37
Arthur	--	--	70	--	37
Banner	--	--	70	--	37
Blaine	38	70	99½	65½	--
Boone	26½	60	82	53½	33
Box Butte	46	78	99½	73½	--
Boyd	34	83½	99½	61½	--
Brown	38½	88	99½	66	--
Buffalo	30½	62	79	58	33
Burt	20½	60	99½	53½	33
Butler	21	60	82	53½	20
Cass	17½	60	82	53½	15
Cedar	31	80½	99½	53½	40
Chase	45½	72½	70	73	33
Cherry	43	91	99½	70½	--
Cheyenne	54	78	70	81½	37
Clay	30½	60	81	58	18
Colfax	21	60	82	53½	28
Cuming	21½	71	99½	53½	33
Custer	35½	67	79	62	34
Dakota	24½	60	99½	53½	40
Dawes	51	87½	99½	78½	--
Dawson	35	65	78	62	33
Deuel	73½	73½	70	74½	34
Dixon	26½	60	99½	53½	40
Dodge	19½	60	82	53½	28
Douglas	17½	60	82	53½	25
Dundy	45½	73	70	73	33
Fillmore	26½	60	82	53½	17
Franklin	34	61½	81	61½	22
Frontier	39½	67	81	67	31
Furnas	36½	64	81	64	30
Gage	24½	59	82	53½	15
Garden	46	78	70	73½	37
Garfield	32½	64½	99½	60	--
Gosper	35½	63	81	63	30
Grant	45	77	99½	72½	--
Greeley	27½	60	82	54½	33
Hall	27½	60	80	54½	28
Hamilton	26½	60	81	53½	18

TABLE 4--Continued

County	Rail rate to--[a]				Truck rate[b] to Kansas City
	Omaha	Gulf	W.C.	Chic.	
Harlan	34	61½	81	61½	25
Hayes	44½	72	70	72	33
Hitchcock	41	69	75	68½	33
Holt	32½	63½	99½	59½	--
Hooker	42½	74½	99½	70	--
Howard	29	61	82	56	33
Jefferson	26½	59	82	53½	15
Johnson	24½	60	82	53½	13
Kearney	33½	61	81	61	22
Keith	45	72½	70	72½	33
Keya Paha	--	--	99½	--	--
Kimball	54	78	70	81½	37
Knox	32	81	99½	53½	40
Lancaster	19	60	82	53½	17
Lincoln	39½	70	70	68	33
Logan	38	70	79	65½	34
Loup	--	--	99½	--	--
McPherson	--	--	70	--	37
Madison	25½	60	82	53½	25
Merrick	26½	60	81	53½	25
Morrill	50½	80	70	78	37
Nance	25½	60	82	53½	28
Nemaha	24½	60	82	53½	13
Nuckolls	30½	60	81	58	18
Otoe	20½	60	82	53½	15
Pawnee	26½	60	82	53½	13
Perkins	45	72½	70	72½	33
Phelps	34	61½	81	61½	25
Pierce	29	61½	99½	57	37
Platte	23	60	82	53½	28
Polk	24½	60	82	53½	20
Redwillow	39½	67	81	67	31
Richardson	24½	60	82	53½	13
Rock	37½	87	99½	65	--
Saline	24½	60	82	53½	17
Sarpy	16½	60	82	53½	20
Saunders	19	60	82	53½	20
Scotts Bluff	51½	80	70	--	37
Seward	21	60	82	53½	17
Sheridan	47	93	99½	74½	--
Sherman	32½	64½	82	60	33
Sioux	54	103½	99½	81½	--
Stanton	25½	75	99½	53½	33
Thayer	27½	60	82	54½	15
Thomas	39	71	99½	66½	--

TABLE 4--Continued

County	Rail rate to--[a]				Truck rate[b] to Kansas City
	Omaha	Gulf	W.C.	Chic.	
Thurston	21½	60	99½	53½	37
Valley	32½	64½	82	60	33
Washington	19	60	99½	53½	28
Wayne	29	78½	99½	53½	37
Webster	32½	60	81	60	20
Wheeler	--	--	99½	--	--
York	24½	60	82	53½	17

[a]Rail rates obtained July, 1962, during personal interviews with Lester Bloyd, Traffic Chief, Kansas City Commodity Office.

[b]Truck rates are provided on an approximate basis and therefore are not for publication.

TABLE 5

BARGE RATES FROM ORIGINS TO:
(Cents per hundredweight)

Origin	Houston - Gal.	New Orleans
Atchison, Ks.	33.25¢	26.95¢
Beardstown, Ill.	22.60	16.30
Burlington, Iowa	25.10	18.80
Cairo, Ill.	20.10	13.15
Cape Girardeau, Mo.	--	13.80
Caruthersville, Mo.	--	12.40
Chicago, Ill.	26.80	20.50
Chillicothe, Ill.	24.15	17.85
Cincinnati, Ohio	23.60	17.30
Clinton, Iowa	26.75	20.45
Dallas City, Ill.	25.10	18.80
Davenport, Iowa	26.75	20.45
Dubuque, Iowa	27.70	21.40
Evansville, Ind.	20.10	13.80
Florence, Ill.	22.60	16.30
Glasgow, Mo.	30.50	24.20
Greenbay Landing, Iowa	25.10	18.80
Greenville, Miss.	--	7.55
Guttenberg, Iowa	28.25	21.95
Hardin, Ill.	22.60	16.30
Hannibal, Mo.	--	18.80
Hastings, Minn.	30.75	24.45
Havana, Ill.	22.60	16.30
Helena, Ark.	--	10.15
Henderson, Ky.	--	13.80
Hennepin, Ill.	24.15	17.85
Henry, Ill.	24.15	17.85
Hickman, Ky.	--	13.15
Jefferson City, Mo.	28.85	22.55
Joliet, Ill.	24.80	18.50
Kampsville, Ill.	22.60	16.30
Kansas City, Mo.	30.50	24.20
Keithsburg, Ill.	25.10	18.80
Kingston, Ill.	23.15	16.85
Lacon, Ill.	24.15	17.85
La Crosse, Wis.	29.60	23.30
La Salle, Ill.	24.15	17.85
Leavenworth, Ks.	33.25	26.95
Lexington, Mo.	30.50	24.20
Lockport, Ill.	25.05	18.75
Louisville, Ky.	--	15.60
Louisiana, Mo.	--	18.80
Memphis, Tenn.	17.05	10.75
Meredosia, Ill.	22.60	16.30

TABLE 5--Continued

Origin	Houston - Gal.	New Orleans
Meyer Light, Ill.	--	18.80¢
Minneapolis, Minn.	31.35¢	25.05
Montezuma, Ill.	22.60	16.30
Moline, Ill.	26.75	20.45
Morris, Ill.	24.80	18.50
Mr. Vernon, Ind.	--	13.80
Muscatine, Iowa	25.10	18.80
Naples, Ill.	22.60	16.30
Natchez, Miss.	13.85	7.55
Nebraska City, Nebr.	38.80	32.50
New Boston, Ill.	25.10	18.80
New Madrid, Mo.	--	13.15
Omaha, Nebr.	38.80	32.50
Oquawka, Ill.	25.10	18.80
Osceola, Ark.	--	12.10
Ottawa, Ill.	24.15	17.85
Owensboro, Ky.	20.35	14.05
Pekin, Ill.	23.15	16.85
Peoria, Ill.	23.15	16.85
Peru, Ill.	24.15	17.85
Plattsmouth, Nebr.	38.80	32.50
Port Cargill, Minn.	--	25.05
Quincy, Ill.	25.10	18.80
Redwing, Minn.	30.75	24.45
Rock Island, Ill.	26.75	20.45
Savanna, Ill.	27.70	21.40
Seneca, Ill.	24.80	18.50
Shawneetown, Ill.	20.10	13.80
Spring Valley, Ill.	24.15	17.85
St. Joseph, Mo.	33.25	26.95
St. Paul, Minn.	--	25.05
St. Louis, Mo.	20.10	13.80
Stillwater, Minn.	--	25.05
Vicksburg, Miss.	15.80	7.55
Waverly, Mo.	30.50	24.20
Winona, Minn.	29.60	23.30

Source: Published Barge Rates on Grain, Schedule No. 3, Issued Jan. 1, 1962, Arrow Trans. Co., Sheffield, Alabama.

SOME FACTORS LEADING TO DISPROPORTIONATELY LARGE SUPPLIES OF HARD RED WINTER WHEAT IN THE GREAT PLAINS

by

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B. S., Kansas State University, 1962

AN ABSTRACT OF A MASTER'S THESIS

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This study was undertaken to analyze some of the major factors which have led to the excessive domestic supplies of hard red winter wheat. The study also indicated some of the problems involved in marketing wheat from the Great Plains. The factors considered were:

(1) increased production of hard winter wheat in the Central Plains;

(2) the wheat transportation structure in the United States;

(3) price support programs on wheat;

(4) the wheat export subsidy program;

(5) new wheat milling techniques.

In reviewing production trends of the various wheat classes, it was found that the percentage of total wheat acreage devoted to hard red winter varieties steadily increased from 32 per cent in 1919 to 56.7 per cent in 1959. The data indicated that hard winter wheats had replaced soft winter varieties in much of Illinois, Missouri, Iowa, and in portions of other Central Plains states. The relative increase in HRW wheat production coupled with total HRW wheat disappearance indicated one reason for the excessive HRW carryover.

The high cost of wheat transportation from the Great Plains to domestic and export markets is another factor which leads to carryovers of hard winter wheat. Rail carriers' rates for wheat, on a national average, have approximately doubled since the end of World War II.

Rates from Great Plains areas to markets have always been relatively high because of the distances involved. However, the large number of percentage rate increases by rail carriers has increased the spread between rates paid by Great Plains wheat producers of the Central Plains and other areas closer to domestic and export markets.

Truck and water competition have not yet proved enough of a threat to rail traffic in the Great Plains to cause general rate reductions by the rails. This seems to be the result of difficulties of finding two-way hauls for trucks and the lack of adequate waterways for barge traffic.

The high levels of price supports in the Great Plains provide another reason for the carryovers of HRW wheat. It was indicated that the cash price for wheat at a local market was seldom above the effective loan rate. The existing basic loan rates not only support the price of wheat--they provide an effective incentive to divert hard winter wheat into Commodity Credit Corporation carryover stocks.

By providing a blanket subsidy rate for all wheat within a given class, the export subsidy program has encouraged the exporting of wheats having widely varying quality characteristics. The combination of loan rates and transportation costs have increased the delivered cost at Gulf of Great Plains wheat relatively more than that of wheat from the Central Plains. A uniform subsidy does nothing to relieve this price inequality. Consequently, the export price of better quality

HRW wheat remains too high.

The existing subsidy does not provide sufficient incentive for exporters to draw wheat from the Great Plains. As long as exporters receive the same subsidy on Central Plains hard winter wheat, they will draw supplies from that region first. The subsidy program, then, has been another factor in the build-up of HRW wheat stocks on the Great Plains.

The effects which air classification of flour may have on the utilization of hard winter wheat remain highly speculative. But it is possible that this milling process will require only very strong hard winter and hard spring wheats to blend with Eastern soft and semi-hard wheats for use in producing bread flours. Such a step would alleviate much of the transportation cost presently attached to delivering to the East a bread flour made entirely from Great Plains wheat.

The review of these five factors indicated that adjustments should be made in either loan rates, export subsidies, transportation rates, or all three factors before the trend toward increased carryover of HRW wheat will be halted.