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MACHINE PRODUCTION AND THE PRICE OF WHEAT

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UNDER the influence of machine production and other factors, the price of wheat has fallen to low levels. In July, 1930 the highest price for No. 2 hard winter wheat at Kansas City was 93 cents a bushel. In comparison with the wholesale prices of other commodities, hard winter wheat had a purchasing power of 72 per cent in July, 1930 when the five year period, 1910-14, is taken to equal one hundred. Other classes and grades of wheat have suffered similar declines in price.

In this discussion, no attempt will be made to determine quantitatively the relative importance of the various factors which may influence the price of wheat. Rather, an attempt will be made to describe some of the conditions contributing to the present situation and some of the changes that have resulted from these changed conditions of which low wheat prices are the most apparent evidence. Particular emphasis will be placed upon the increased use of large-scale machine methods in wheat production in the western portions of the United States.

Brief mention may well be made of some other factors influencing wheat prices in the United States at present. Wheat production has been expanded in many important wheat growing countries. The wheat produced in three crop years, 1927-28, 1928-29, and 1929-30, gave the world the largest three-year supply of wheat in all history. As a consequence, the annual carryover of old wheat into new crop years has increased to record breaking figures, and prices have declined precipitously.

In the hard winter wheat belt of the United States significant changes in wheat production methods have occurred in recent years. Better adapted and higher yielding varieties have been developed and are now widely used. Better methods of preparing the seed-bed, as compared with the methods in common use ten to fifteen years ago, are now generally practiced. These better varieties and improved methods are resulting in higher and more certain yields and reducing the hazards of wheat growing in the Great Plains region. Other wheat growing sections of the United States have made similar improvements in wheat production. These changes

have tended to lower the cost of wheat production and to maintain the total production of wheat in spite of lower prices.

The demand for wheat has also undergone changes. In the United States the home baking of bread has been decreasing and baker's bread is much more commonly used than twenty to thirty years ago. As a consequence, the demand for the high protein wheats has increased. There have been significant changes in the food habits of people. Thirty years ago the average per capita consumption of wheat and wheat products in the United States was 5.4 bushels. At present, it is 4.2 bushels. Fruits, vegetables, dairy products, and other foods have partially displaced bread and other wheat products in the diet of the average American. Also, in making bread, products other than wheat flour are now used to a greater extent. Similar changes in wheat consumption appear to have taken place throughout the world excepting in certain Oriental countries where wheat consumption has increased.

Changes in tariffs have also played an important part in producing the present situation. In 1923, wheat was admitted free of duty into Italy and Germany, while France had a duty of 30.52 cents a bushel.¹ At present, Italy has a duty of 86.67 cents a bushel, France, 85.35 cents, and Germany, 97.24 cents. These duties average nearly fifty per cent higher than the total price received for wheat by United States farmers during the harvest of 1930. Obviously, these high tariffs imposed by important wheat importing countries have a significant effect upon wheat prices in both importing and exporting countries. However, the mere statement of the tariff rates on wheat does not tell the whole story. There is the interaction of tariff rates on all commodities and their effects upon international trade. Furthermore, tariff rates may not be fully effective either because of their actual working in international trade, or because they are not fully applied to all of a commodity that is imported. These matters are mentioned to indicate the influence of tariffs on wheat prices. Any adequate treatment of the subject would far outrun the bounds of a paper such as the present one.

Also in any treatment of the subject the United States tariff act of 1930 would figure prominently. Perhaps enough has been said to indicate why no attempt has been made to consider quantitatively

¹ See *Wheat Facts*, Part I, Page 22, of the Bureau of Agricultural Economics, United States Department of Agriculture, July, 1930.

the relative importance of the many factors influencing wheat prices.

In addition to the factors that have been mentioned, the increased use of large-scale machine methods in wheat production in many wheat growing regions has had a prominent part in creating the present situation. Machine production of wheat began in earnest following the invention and introduction of the twine binder in the period 1860-1870. Wheat production in the United States was rapidly expanded on the level, fertile prairies of the middle western portion of the United States where free land was available. The wheat industry of the United States began to migrate westward and has been migrating westward ever since. Wheat prices, under the influence of the increased and lower-cost production accompanying the introduction of the binder, declined to low levels. The acreage of wheat grown by one farmer was increased by the use of the binder and, in turn, the size of the usual wheat farm increased.

As the wheat belt moved westward, the header came into use and added impetus to the movement toward larger acreages of wheat per farmer and larger farms. The header, a machine that merely cuts the heads of wheat and elevates them into a barge in which they are hauled to a stack, reduced costs of production and aided in extending the wheat belt further into the drier regions of the Great Plains.

During the late part of the recent World War, a third step in increased use of large-scale machinery in wheat production was taken. Under the impetus of a scarcity of farm labor and high wages, a few farmers commenced using small types of the combined harvester thresher, a machine that had been used in the Pacific Northwest of the United States for many years. This machine cuts and threshes the standing grain in one operation. It was found that the combined harvester thresher was well adapted and that it reduced harvesting costs approximately one-half. Furthermore, the acreage which can be handled by this machine in one season is approximately twice the capacity of a header and the trend toward larger farms was given new impetus. In attempting to use the newer machines efficiently wheat farmers increased the size of their farms by purchasing or leasing nearby land or by disposing of their farms in the older wheat growing sections and

moving westward to new land which they broke from the prairie sod and brought into wheat production.

The influence of these three machines, the binder, the header, and the combine, on wheat production in the United States has been toward larger farms, larger acreages of wheat per farm, and lower costs of producing wheat. The introduction of the binder more than doubled the acreage of wheat which one farmer could produce efficiently. This acreage has been doubled twice since then, once when the header came into general use and again with the introduction of the combine.

The combine should not be given all of the credit or blame for the recent expansion in the acreage of wheat in the western Great Plains region. The tractor and the truck and other large-scale machines have played an equally important part. In 1915 there were approximately 2,500 tractors in Kansas which is the largest producer of wheat of any of the United States. At that time, it was seriously questioned if the tractor would ever be satisfactory for field work. Since then the farm tractor has been materially improved and is now generally used in wheat production. Kansas has more than 50,000 tractors and other wheat growing states have proportionately as large numbers. Many farms depend entirely upon mechanical power.

The truck has also come into general use on wheat farms. The development of good highway systems has aided in making this possible. Ten to twenty years ago, all wheat was hauled to the local elevator or shipping point by horses. Now practically all of it is hauled in motor trucks. The farm that is ten or more miles from its nearest shipping point formerly was at a distinct disadvantage. Good roads and the truck have wiped out much of this disadvantage.

The use of these large-scale machine methods has not extended to all parts of the United States. They are best adapted to the fertile, level lands of the Great Plains region. Portions of the United States that could not use these machines have tended to reduce or eliminate wheat production from their farming systems. The history of wheat production in the United States has been one of migration ever westward, the increased use of machine methods and the lowering of costs per bushel.

The wheat industry in other important wheat growing countries

has undergone similar changes. Canada has been, and still is, materially expanding her wheat acreage in the western prairie provinces. Argentina and Australia have also expanded wheat production. Soviet Russia is endeavoring to encourage machine methods on her collective farms and on the government operated lands. In all of these countries and also in others, large-scale machine methods are becoming more important in wheat production.

The effect of these and other influences has been to increase wheat production in many parts of the world and to reduce the cost of producing a bushel of wheat. As a consequence, competition for world wheat markets is becoming more and more intense. Inasmuch as the United States, Canada, Australia and other countries have large additional areas that can be brought into wheat production with present methods it seems probable that this severe competition will continue with low wheat prices in all wheat exporting countries.

The shifting of the wheat industry and changes in its character in the United States have produced pronounced effects in ways other than price changes. The increased use of combines has resulted in earlier and more concentrated marketing of the crop. The combines harvest, ready for market, millions of bushels of wheat within a few weeks. Prior to 1926, wheat receipts at Kansas City during July never exceeded 15,000 cars. In 1926, they were 22,970, in 1927, a short crop year, 14,036, in 1928, 25,499 and in 1929, 25,511 cars. This market in the last five years has been receiving approximately fifty per cent of its total wheat receipts in the two months of July and August, and in 1929, approximately 40 per cent of the year's receipts came in July. This movement affects local elevators, transportation systems, terminal markets, and all other agencies aiding in the movement of the crop. It produces problems in marketing, transportation, storage, and other fields.

Within the regions growing the wheat, many problems have developed. Among these are questions of the most desirable size of farms, the best combinations of enterprises, the tenure of the land, the improvements on the land, the desirability of farm storage and local elevator storage for wheat, the place of livestock in the farming systems and many others.

The situation is one of unusual interest to farm management research workers. Large-scale production has taken the form of

large corporation farms in some instances. However, most of the farms are of the one family size. These two groups present opportunities for distinctly interesting and useful studies of relative efficiency in production and other economic problems.

The social conditions of the community are also of more than passing interest. Many of those farming the land reside in nearby towns. This has not been typical of American agriculture in the past. Will a portion of American agriculture be of this type in the future? It is sometimes said the American wheat grower works but three months of the year. This is not true of many of them. It is true that they are employed as wheat farmers but three or four months of the year but many of them have other employment or other interests during the other months of the year.

The influence of the increasing size of the average farm on farm population and through population on schools, churches, and other community institutions, provides still further interesting social problems. On the other hand, in the older regions, the withdrawal from wheat production is not accomplished without problems. In general, the factors bringing about low wheat prices are producing all of the problems of a shifting and, in many sections, a growing agriculture. These problems invite the best efforts of research workers in agricultural economics and related fields. The research workers of the United States are attacking these problems vigorously and are securing knowledge that is of great value in aiding toward the solution of these problems.