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Great Plains Agricultural Council Publication No. 21

Wheat, People and the Plains

Fact Sheet I

A Problem With No Easy Answers

The hopes and desires of Great Plains people are similar to those of American families in other regions—progress, prosperity and stability. Basic changes are needed and are taking place—on our farm and ranches, in our ways of doing business and in providing professional and public services—to achieve these goals. Making these changes requires imagination, initiative, courage, patience, leadership and statesmanship.

The adjustment and development problems of the Plains have arisen from the unique character of the region and from economic, political and social changes in the nation and the world. Wheat, a mainstay of the Plains economy, and the people dependent upon wheat for their livelihood have been dramatically affected by these changes.

American agriculture, generally, has a greater capacity to produce than domestic and foreign markets can absorb; there is only limited opportunity for expanding these markets. Our agricultural productive capacity—if fully utilized—could quickly depress farmers' prices and incomes under the existing market situation.

An imbalance between production and demand has plagued wheat since 1920. Other agricultural commodities also have suffered from similar problems. Cotton, feed grains, rice and dairy products — like wheat — have from time to time been in "surplus."

Surpluses are a symptom of the tendency for agricultural production to outrun the growth of demand. Our surpluses have tended to increase, in spite of efforts to "do something" about the price and income problems of agriculture.

Wheat prices in recent years have been maintained at levels which have discouraged its use for purposes other than human food. Acreage allotments accompanying price support programs have put a premium on land with allotments, causing land prices to rise. Land values reflect the level of price supports. Acreage controls on wheat have caused shifts to production of other crops, but haven't prevented the buildup of a large surplus.

Since most U.S. wheat is produced in this region, the "wheat problem" hits the Plains hard.

The Plains are semi-arid with a highly variable climate. Topography and soils are suited to large-scale crop farming. Lack of natural resources other than land has resulted in a Plains economy based on agriculture. These characteristics also limit the type of agriculture in the Plains to farming systems based primarily on wheat, grass, cattle and sheep.

The Plains is a raw material producing area—mostly farm products. Principal processing centers and markets are located outside the region. Main concentrations of consumers are located considerable distances to the east and west.

Great Plains population is widely dispersed over the dry-farming and ranching areas. Providing roads, schools, communication and other services to these scattered families results in high costs per person.

New technology in crop production and government programs is changing the character of Plains agriculture. Farms and ranches have increased in size. Areas which long specialized in wheat production now have other enterprises, such as feed grain production, hog raising and cattle and lamb fattening.

Irrigation has created areas of intensive agriculture. A limited number of specialized crops—like safflower, mustard, and sunflower—are now grown. New varieties of grain sorghums and corn have been adapted for the Plains. These special crops and feed grains have become more important since wheat acreage has been restricted.

Wheat in the Plains, the Nation, the World

Wheat is important to people other than wheat farmers. It is important to businessmen and communities serving wheat growers. Machinery and farm supply dealers, credit agencies — and many others—count Plains wheat farmers among their important customers.

Plains wheat is vital to many marketing and supply firms located outside the Plains. Elevators, grain transporters, flour mills, bakeries, retail grocers, and international grain exporters are directly involved in handling the product.

Wheat is also important to many other countries. Annual world

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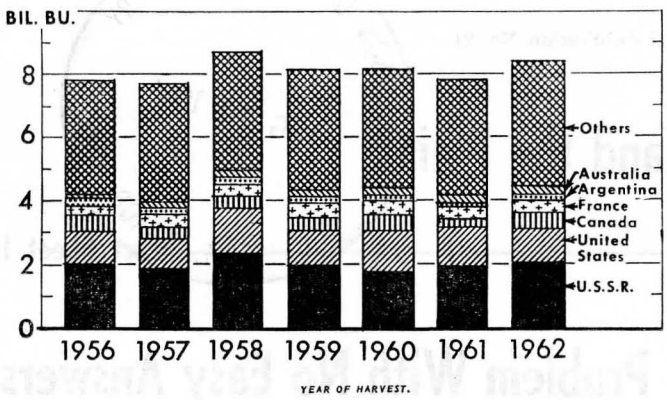

Fig. 1. World wheat production is at near record levels. This means greater competition for world wheat markets.

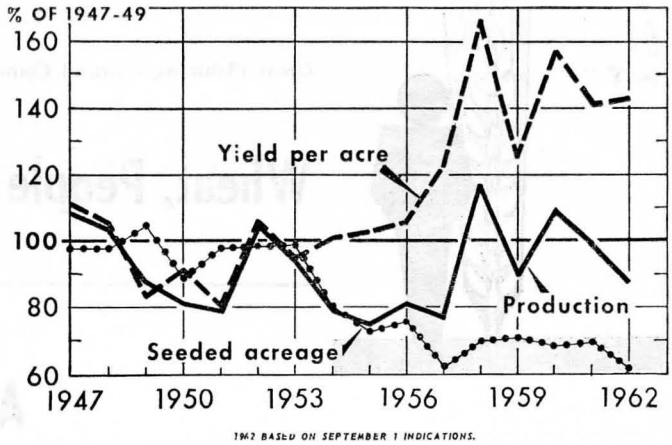

Fig.2. Although seeded acreage has declined in the U.S., consistent increases in yield per acre have held production fairly steady.

wheat production is about 8.5 billion bushels, and—at current consumption levels—a serious world wheat surplus problem exists. Wheat surpluses have been a problem in the United States, Canada, Australia, Argentina, and France. Other wheat-producing nations could boost their yearly wheat production by 500 to 700 million bushels. Great Plains farmers have the capacity to raise 200 to 300 million bushels more wheat each year than they presently grow.

Commercial world trade in wheat has not been able to absorb existing production capacity, although millions of people are underfed.

If we are to make progress in solving the "wheat problem", we need a better understanding of the situation. We need to know more about the alternative solutions.

The other four publications in this series, "Wheat, People, and the Plains" will shed some light on this complicated problem. They will offer no quick or easy solutions.

WHEAT PRODUCTION

Few crops are as widely grown as wheat. Improved varieties, irrigation, new techniques in cultivation, fertilization, and harvesting all have helped make wheat production possible in areas where little or no wheat was previously grown. These things also have made it possible to grow more wheat per acre. Like our own nation's production, world wheat production is at near-record levels (Figure 1).

U. S. Wheat Production

In the United States per acre yields of wheat have risen steadily and rapidly. Thirty years ago they averaged less than 14 bushels per acre. Now they average around 25!

Seeded acreage of U.S. wheat was reduced 35 million acres between 1949 and 1962.

Although acreage has declined, we continue to produce near-record wheat crops (Figure 2).

Wheat is grown in almost all 48 mainland States. Figure 3 shows distribution of total U.S. wheat acreage in 1959, and the main production regions where the different classes of wheat are grown.

Table 1 shows recent production of U.S. wheat, by classes.

Great Plains Wheat Production

Wheat is the most important single crop in the Great Plains—both in acreage and in value. Table 2 shows production and value of wheat produced in the eight major wheat states in the Plains, compared with the U.S.

It is easy to see how important the Plains States are in the total U.S. wheat economy!

USES OF WHEAT

Wheat has been called the "staff of life" since Biblical days. It is used in a number of ways: human food, animal feed, seed, and to make industrial products (Figure 4).

Human Food

About 40 percent of annual U.S. wheat production—or 500 million bushels—is used for human food. The bottom part of Figure 4 shows how constant our total domestic consumption of wheat as human food has been—in spite of a rapidly rising population and increased consumer income. It has remained the same because—with our rising level of living—we eat less wheat per person. In 1910 our per capita consumption of wheat was 310 pounds per year. Now it is only about 165 pounds.

As income and living standards rise, people tend to change their eating habits. They eat less bread

Table 1. U. S. production of wheat by classes, 1953-1962.

Class of wheat	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962
	(Millions of bushels)									
Durum	14	5	20	39	40	22	20	34	21	72
White	207	160	143	155	163	174	174	151	142	154
Soft Red Winter	231	185	175	187	155	192	156	190	202	154
Hard Red Spring	217	145	184	178	169	233	151	188	116	176
Hard Red Winter	504	489	415	446	429	836	620	794	754	536
All Wheat	1,173	984	937	1,005	956	1,457	1,121	1,357	1,235	1,092

Source: USDA, ASCS.

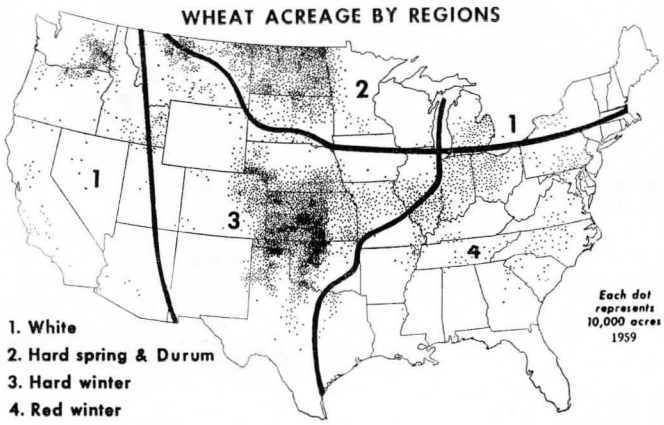

Fig. 3. Wheat is grown in all mainland States. This map shows where the different classes of wheat are grown.

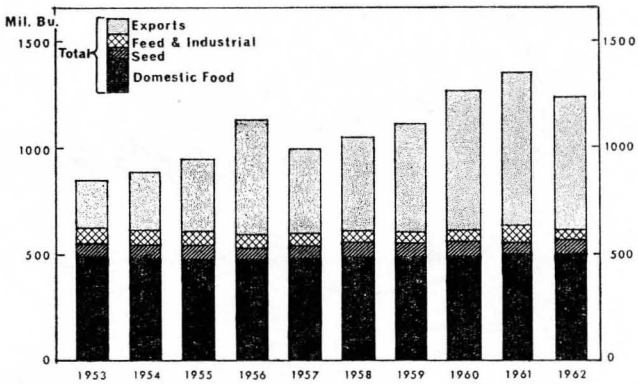

Fig. 4. U. S. Wheat utilization, 1953-62.

and cereal products, but consume more meats, fruits and vegetables. The peak in per capita cereal grain consumption for human food appears to be reached at fairly low income levels.

Of the food uses of wheat, most is in the form of wheat flour. A small amount is used for wheat cereals. Not all wheats have the same end-product use (Table 3). Hard wheats are used for yeast-leavened products—breads, rolls, and sweet goods. Soft wheats are used for chemically-leavened products — cakes, pies, cookies, doughnuts, biscuits, crackers, and some pastries. Durum is used for macaroni and spaghetti. However, recent developments in milling technology may change this and make it possible for millers to tailor-make flours for specific end-uses from any one class of wheat.

The food industry is becoming more exacting in its needs. Providing wheat with the desired end-use properties will continue to be essential if wheat producers expect to hold their markets.

Animal Feed

About 45 million bushels of wheat per year was used in the U.S. for animal feed during 1956-60. The reason so little wheat is used for feed is primarily economic.

Animal nutrition scientists have found that wheat is 5 percent more nutritious than a pound of corn for hogs, beef cattle, and poultry. It's equal to corn for dairy cattle and 15 percent less nutritious than corn when fed to sheep. But when viewed from the cost angle, corn and other feed grains have supplied more nutrition per dollar than wheat under recent price support levels.

Production efficiency is another aspect of the economics of the use of wheat as animal feed. Here the question is how to grow the most total digestible nutrients per acre at the lowest relative cost. In some areas, feed grains come out ahead of wheat if priced according to feed values. However, wheat priced at feed levels still has a comparative advantage in much of the Great Plains.

Seed

About 61 million bushels of wheat are used for seed each year. Seed will remain a minor use, since, on the average, only 1 to 1¼ bushels are planted per acre.

Industry

Very little wheat (about 125 million bushels per year for the past five years) has been used for industrial production. Starch can be pro-

Table 2. Great Plains and U. S. wheat production and value, 1955-59, 1960, 1961, and 1962.

Production area	Average 1955–59		1960		1961		1962	
	Production	Value	Production	Value	Production	Value	Production	Value
	(mil. bu.)	(mil. $)	(mil. bu.)	(mil. $)	(mil. bu.)	(mil. $)	(mil. bu.)	(mil. $)
Colorado	38.7	67.5	66.6	111.3	56.8	98.8	36.2	83.0
Kansas	176.2	330.7	294.4	512.2	273.7	490.0	211.2	460.8
Montana	92.0	164.2	79.4	131.8	54.0	100.6	78.3	166.2
Nebraska	80.7	150.8	85.7	148.3	78.8	139.5	53.8	117.6
No. Dakota	118.4	234.7	127.5	232.3	69.4	157.6	158.5	370.1
Oklahoma	68.5	126.3	121.3	212.3	110.8	199.5	72.0	171.1
So. Dakota	31.5	60.5	46.1	82.5	32.5	65.9	29.8	74.6
Texas	39.7	72.9	78.8	138.7	84.9	152.8	43.7	107.9
8 Plains States	645.7	1,207.6	899.8	1,569.4	760.9	1,404.7	683.5	1,551.4
U.S. Total	1,195.4	2,040.4	1.359.3	2,365.2	1,234.7	2,261.0	1,091.8	2,473.9
G. P. as % of U.S.	54.0	59.2	66.2	66.4	61.6	62.1	62.6	62.7

Source: USDA, ASCS.

Table 3. U. S. food use of wheat, by type.[a]

Product	Types of wheat (mil. bu.)			
	Hard	Soft	Durum	Total
Bread	200	....	....	200
Rolls	10	....	....	10
Biscuits & muffins	....	3	....	3
Crackers	4	19	....	23
Cakes	....	6	....	6
Pies	....	3	....	3
Other sweet goods	11	8	....	19
Alimentary paste products	8	....	22	30
Flour:				
All purpose	86	72	....	158
Whole Wheat	2	....	....	2
Cake	....	12	....	12
Prepared mixes	....	22	....	22
Wheat Cereals	10	2	....	12
Total (mil. bu.)	331	147	22	500
Total (%)	66	30	4	100

Source: USDA, ARS.
[a] Marketing year beginning July 1, 1959.

duced more cheaply from other grains, chiefly corn. Likewise, wheat can't compete with petroleum as a source of alcohol.

Many new industrial uses for wheat have been developed, but never put into production, because less expensive substitutes have been available.

Exports: An Additional Market

So far, in discussing uses of wheat, we haven't considered exports. Since World War II, exports have become a major market for U.S. wheat.

Since exports have come to play such an important role in marketing our wheat crop, we've devoted all of one of this series of five publications to foreign trade policies and programs.

RESEARCH MAY HELP

Continued research on production, marketing, processing, and utilization may help lower costs, increase sales, or permit production of new and improved wheat products.

Efforts to increase consumption of wheat as human food have centered on research to develop new and better products. Not enough time has elapsed to fully evaluate results. To date, new wheat products have not had a significant effect on total food consumption, unless you credit them with preventing a further decline.

New techniques such as in the processing of bulgar—a par-boiled, dried wheat product—hold some promise of increasing consumption of wheat in developing nations. Bulgar can be stored for long periods of time. It is inexpensive and is easily prepared. Thus, bulgar may help introduce needed cereal protein into the diets of people who haven't been used to eating wheat in any form. Domestically, bulgar can be used for soups, main courses, and desserts.

Industrial utilization research offers some helpful prospects for increasing wheat use—such as sizing materials for greater wet-strength in paper and adhesives for plywood. These are, at best, prospects. Current industrial use is almost negligible.

A new wheat variety developed by researchers in Washington is an example of the contribution research can make to production. The Gaines variety has yielded more than 100 bushels per acre. It has favorable milling qualities making it competitive with other wheats as a human food.

Improved or new milling techniques and equipment (such as air classification or turbo milling) are another outgrowth of research.

Research can help improve wheat varieties and lower production and marketing costs. It can improve or develop new processing techniques and end-product uses.

Reductions in production, marketing, and processing costs may increase returns without increasing the use of wheat products. Development of new or improved products may increase the use of wheat. Either could benefit the wheat industry as well as consumers.

OVERCAPACITY: THE WHEAT PROBLEM

Many people feel that an oversupply of wheat (in relation to use) is the wheat problem, but it is really only a symptom of the basic problem—too many resources invested in wheat production. Despite agreement on the cause of the wheat problem there is little agreement on the solution to it.

U.S. wheat production has exceeded use in most of the years following World War II (Figure 5). Excess wheat has been added to carryover stocks.

Use of wheat has had a variable history. We stepped up use during World War II — principally by using wheat as livestock feed. When wartime feed and industrial use declined, total use dropped off during the eight postwar years—almost to prewar levels. Exports under special government programs have accounted for increased use during the past 10 years.

The U.S. has decided, as a matter of national policy, that some wheat reserve is essential to national welfare. Reserve provides a national stockpile in case of war or other international contingencies and insurance against a short supply resulting from natural disasters, like drought.

Let's call carryover larger than reserve needs **surplus.**

How much wheat carryover is enough to provide an adequate

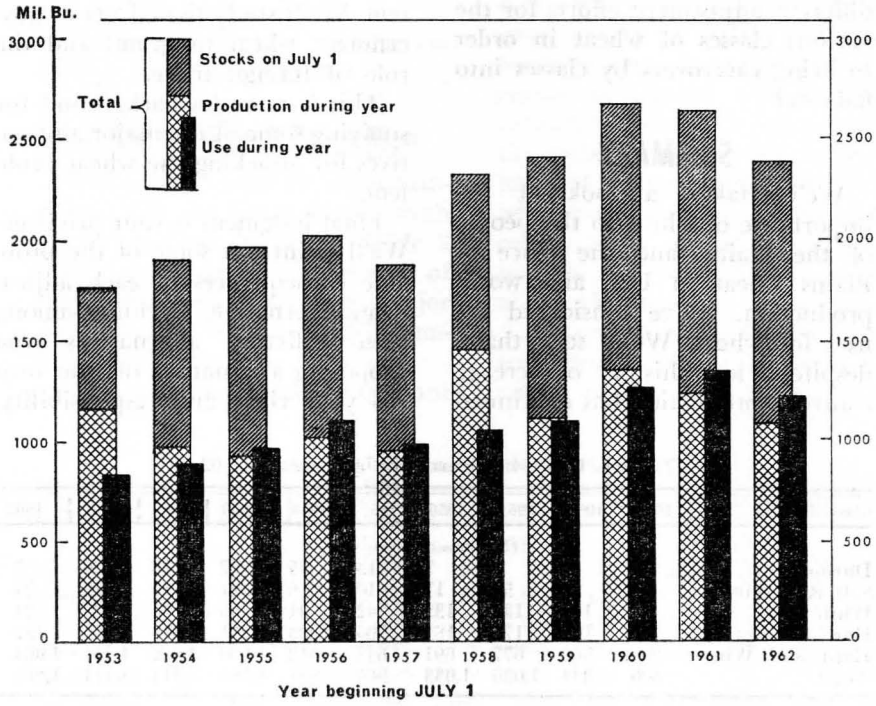

Fig. 5. When production exceeds use, carryovers mount.

supply for anticipated use, plus a reasonable reserve?

How do others, especially people in other lines of business—or in other parts of the country, or in other countries—feel about this?

What is the basis for these judgments?

One Wheat or Many?

We've seen that there is a degree of interchangeability for end-product use among the different classes of wheat. Advances in milling and baking technology may increase this even more.

The five major classes of wheat have different sized carryovers. A look at the carryover by classes shows hard red winter wheat to be —by far—in the greatest supply (Tables 4 and 5).

Hard red spring wheat carryover has exceeded use for 8 of the last 10 years. Like hard red winter, hard red spring carryovers are high in relation to both use and production. Durum wheat supplies, as a result of special programs, increased sharply in 1962.

What are some of the factors that have contributed to different sized carryovers among the five major classes of wheat?

Does the size of carryover of one or more classes of wheat justify different adjustment efforts for the various classes of wheat in order to bring carryovers by classes into balance?

SUMMARY

We've taken a look at the importance of wheat to the people of the Plains, and the place of Plains wheat in U.S. and world production. We've considered the uses for wheat. We've seen that—despite a long history of acreage controls—production has continued to exceed use so that supplies of wheat are twice as large as our annual use. But we've said that large supplies are a symptom of the basic problem—too many resources committed to wheat production. Although the Plains is particularly affected, because it is the major U.S. wheat producing area, the "wheat problem" is a national—even worldwide problem.

We could tackle the "wheat problem" by changes in storage policy, production, use, or the marketing system, either alone or in combination with each other. But since these alternatives are so closely related to each other, we need additional background before making decisions on how to make the desired adjustments.

In the publications that follow we'll take a more detailed look at the relationship of supply and demand in setting the price. We'll inspect the wheat marketing system. We'll study the effects of government wheat programs and the role of foreign trade.

This is essential background for studying some of the major alternatives for attacking the wheat problem.

Final judgment is your privilege. We'll point out some of the probable consequences of each adjustment alternative. Deciding among these different alternatives—even proposing alternatives of your own —is your right and responsibility.

Table 5. U. S. wheat carryover by classes, expressed as month's supply on hand, June 30, 1953-1962.

Class of wheat	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962
				(Months)						
Durum	4	3	6	5	11	10	9	8	2	19
Soft Red Winter	4	3	1	1	1	1	1	1	2	1
White	9	13	11	2	2	5	5	3	2	3
Hard Red Spring	15	12	12	13	14	16	14	16	13	13
Hard Red Winter	20	22	21	16	16	22	22	19	16	16
All Wheat	13	14	13	10	11	15	14	13	12	12

Source: USDA, ASCS.

Table 4. U. S. wheat carryover by classes, 1953-62.[a]

Class of wheat	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962
				(Millions of bushels)						
Durum	7	5	2	7	13	25	22	18	20	5
Soft Red Winter	38	70	50	17	10	6	21	10	12	24
White	38	104	135	133	42	34	65	66	38	21
Hard Red Spring	128	195	172	185	196	203	251	218	237	137
Hard Red Winter	395	560	677	691	648	613	936	1,002	1,104	1,068
Total	606	934	1,036	1,033	909	881	1,295	1,314	1,411	1,305

Source: USDA, ASCS.
[a] Stocks on hand, June 30.

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This publication is one of five in a series, "Wheat, People, and the Plains" prepared by the following Agricultural Economists from the Land Grant Colleges or Universities of the Great Plains States: Raymond C. Stack, Colorado; Robert J. Bevins, Kansas; William Ewasiuk, Montana; Everett E. Peterson, Nebraska; Norbert A. Dorow, and H. W. Herbison, North Dakota; James R. Enix, Oklahoma; Thomas D. Aaron, Texas; Earl Moncur, Wyoming. E. Dean Vaughan served as chairman of the group while an economist at Montana State College and continued as a consultant after joining the staff of the Federal Extension Service, USDA. S. Avery Bice, associate director, Colorado, served as administrative advisor. Donald W. Dickson, information specialist, FES, was editorial consultant to the committee.