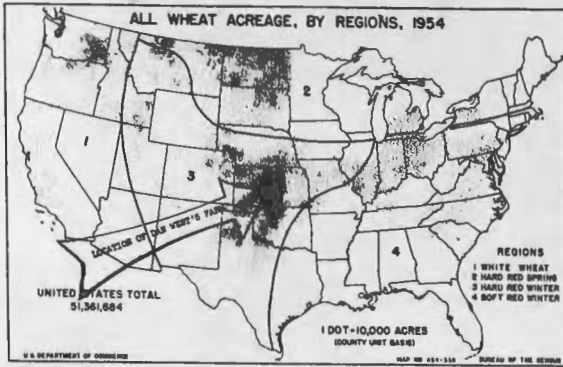


## POPULAR REPORT

### CHAPTER 1—BREAD

#### Dan West and daily bread.



#### A precarious business.

Central Kansas where Dan West lives is part of the Great Plains. It used to be a sea of waving grass. Now on a hot summer day you look out over a sea of wheat, which is another kind of grass, and there is nothing else as far as the horizon but the golden wheat, bending under the wind's touch, and a road as straight as taut wire, and gaunt poles stuck in the ground at regular intervals to hold up the telephone and electric lines.

It is from Dan West and other farmers in the wheat business that you get your daily bread. This deep dark soil, slowly evolved under generations of grass, grows wonderful wheat; and the dry climate where Dan West lives makes the grain hard and thrifty, packing it with an intense concentration of that glutenous protein which makes good bread because it stretches and stretches like a piece of fine thin rubber when the fermenting yeast blows a million tiny air bubbles in the loaf. Wheat with that kind of quality of protein fetches a premium with the flour millers and the bread bakers, and it should; for growing wheat in the place where Dan West lives is a precarious business in spite of all the advances that have been made by science. The rainfall here is supposedly 15 to 25 inches a year, but from one year to the next it may vary by 50 or 75 percent, and in the drier area west of where Dan lives it is even more fickle. This hard red winter wheat Dan grows is as good grain as you will find anywhere in the world, but the growing of it is not without uncertainty and anxiety. Even a good year may bring an ill wind. For if Dan and his fellow wheat farmers produce a bumper crop, the effect in lower prices might conceivably be almost as bad as a crop failure.

#### Conservation.



#### Research and the enemies of production.

Every year Dan leaves part of his cropland fallow—that is, he does not seed it but cultivates the soil every so often to keep down weeds. Farther west in Kansas, the wheat farmers leave about half their cropland idle each year because the rainfall is so scanty that it is not safe in any year to try to produce wheat on more than half the land. This system of cultivated fallow that saves up moisture, helps prevent wind erosion, and takes some of the risk out of wheat growing in dry areas, was developed through research in the agricultural experiment stations, and it is one of the many results of research that make it possible for Dan to be the able farm operator he is—or to stay in business, in fact.

An even more striking result is the successful battle against wheat diseases. It was not so many years ago that wheat farmers were completely at the mercy of such deadly diseases as wheat stem rust, for example. The almost invisible spores of the rust fungus would steal over an area on the wind currents, alight on the wheat plants over thousands of acres, and kill them as effectively as an atom bomb can snuff out a city. Now, as a result of years of cooperative research

in the United States and Canada, including the work of plant explorers who sought disease-resistant (and likewise drought-resistant) breeding material the world over, wheat growers have varieties that can stand up against this enemy without succumbing. And you can be sure of your daily bread. But the fight is a never-ending one. Men like Dan West produce generous crops only because the plant breeders are continuously on the job creating varieties of wheat that will resist the ever-changing strains of the stem rust, which itself continually produces new strains like the many-headed monster of mythology that grew a new head as fast as you cut off the old one.

This work of the plant breeders, important as it is, is only one small aspect of the complicated mass of research relating to agriculture that constantly goes on in our Federal and State experiment stations and in private industry. According to Professor Theodore Schultz (*The Economic Organization of Agriculture, 1953*) the Federal and State governments in the United States spent over 106.5 million dollars on agricultural research in 1951, and in 1950 they spent some 73 million dollars on cooperative extension work largely devoted to bringing the techniques developed by research to the farmers of this country. Schultz calculates that the savings resulting from this research and extension work in agriculture amounted in the single year 1950 to a great deal more than all the expenditures of the Federal and State governments for this kind of work in the 40 years between 1910 and 1950. The research and extension work in those 40 years cost 7 billion dollars. He calculates the savings in 1950, brought by the application of improved techniques, at somewhere between 9.6 and 16 billion dollars—a return on the investment, he comments, many times as large as the returns on normal business investments elsewhere in the economy.

#### Machinery does the work.



Though Dan West may not realize it consciously, not only his adaptation of soil-management practices to climate and his use of superior disease-resistant wheat varieties but his whole farm operation is based on the results of research and experiment just as truly as is production in, say, a modern automobile plant. The most important factor in this complex business, and the most important one in shaping the character of present-day American agriculture, is machinery.

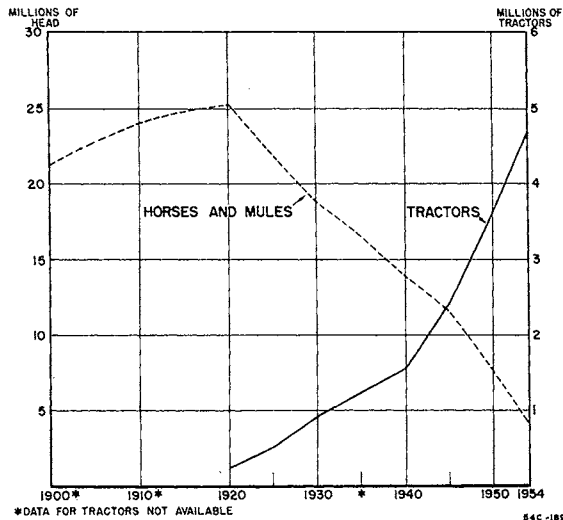
When most people were farmers a man needed little more than a good piece of land, enough seed, some simple tools, reasonable weather, strong muscles, patience, and an observant eye to produce the bread for his family and perhaps a little more. Today the requirements are far more elaborate. Dan West must have land, of course, since food still comes from Mother Earth; she is necessary in about the same sense as air is necessary to an airplane; it cannot fly in a vacuum, though you can produce food hydroponically nowadays with only water and fertilizer and no soil. As for muscle, Dan may not need much more of that than the pilot needs to run the plane. Petroleum products and some very complicated machinery do the work. What Dan does need is knowledge, skill, managerial ability, and money.

Dan West is a large-scale farmer, owning 1,200 acres of land, of which some 875 acres are cropland—500 acres in wheat, 295 in hay and pasture, 45 in grain sorghum (which substitutes for corn in this dry country), and 35 or so in cultivated fallow. Normally there are some 75 head of beef cattle on the farm, including 4 or 5 dual-purpose cows (good for meat and milk), a few hogs and sheep, and a flock of

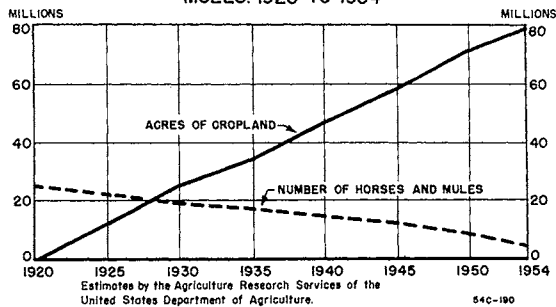
70 to 80 chickens. The milk and pork and lamb and eggs are produced mainly for the family's own use—a practice that has been declining, however, as commercial farms become specialized and concentrate more exclusively on production for market. The beef cattle add materially to Dan's income, and in addition to grazing on pasture they are turned loose in the wheat fields for a while when the plants are young, lush, and high in feed value.

### Work animals disappearing.

HORSES AND MULES AND TRACTORS ON FARMS:  
1900 TO 1954



ACRES OF CROPLAND MADE AVAILABLE BY THE DECLINE IN  
HORSES AND MULES, AND NUMBER OF HORSES AND  
MULES: 1920 TO 1954



### One tractor or 60 horses.

Dan has a large, heavy-duty tractor which he uses for preparing the soil for seeding and for harvesting his wheat. In work capacity it could easily take the place of 50 to 60 horses. The tractor takes up much less room than 60 horses and requires no stable chores. There are also two other tractors on the farm, one a small general-purpose machine used for all kinds of light work. The development of light, flexible, rubber-tired tractors during the last 30 years or so is what made machine-farming possible on even the smallest farms. In 1954, there were 4.7 million tractors on the 4.8 million farms of America, doing work once done entirely by animal and human muscles.

Dan's farm is so thoroughly mechanized that in spite of the size of the operation, he and his son Don are able to do practically all the work themselves, with a little hired help during the busiest seasons. There is not a single work animal on the farm, or for that matter on any of the other wheat farms nearby. But in the days when the plowing and harvesting were done by horses, it was not unusual to see 12 or more (as many as 30 in some parts of the wheat country) harnessed in a complicated multiple hitch. In those days harvesting crews swarmed over the countryside at harvest time, and the women-folk were kept busy getting three big meals a day for them. Now the fuel for all this work does not come out of a hot kitchen or hay-field or oat bin. It comes from the gasoline tank and electric power line. The shift from animal to machine power is not yet quite complete in American agriculture, but it has made long strides in a short time.

The change has not only altered the character of farm work; it has also freed a large amount of land from the production of fuel for work animals and made it available for the production of food and fiber. But this is only a side-effect of the machine revolution, though an important one, partly responsible for the development of surpluses. More significant and dramatic is the increase it has brought in the work capacity of farmers. The severe shortage of agricultural labor in the two world wars, against the urgent need for increased production, had much to do with speeding up this development.

Dan has a large truck for hauling, a light half-ton pickup, and two passenger automobiles. The part played by trucks in American agriculture today is strikingly indicated by the fact that the eighth of the population on farms owns more than a fourth of all the trucks in the United States. (There were 2.7 million on United States farms in 1954—about a half million more than in 1950.)

### Airplanes and farms.

It is also a fact that more airplanes are now used for seeding, dusting, spraying, and other agricultural operations than are employed by all the country's airlines put together for carrying passengers and freight—though the planes used in agriculture are, of course, smaller.

In preparing some 500 acres for wheat each fall, Dan uses mainly big plows, each of which disks a ten-foot wide strip of soil at a time. This disk, which is actually a plow, also does the work of a harrow, and if a seedbox is attached the plowing, harrowing, and planting can all be done in a single operation. The wheatland disk is a good machine for cultivating summer fallow, too. During the past few years hydraulic, mechanical, pneumatic, and electric lifting devices have been developed for plows and cultivators so that merely by shifting levers the man in the driver's seat can regulate the depth at which each unit in a complicated gang of implements will operate.

A farm horse worked on the average about five hours a day. A tractor equipped with lights can work around the clock if necessary. The flexibility, power, and speed of modern machines are important factors in directly increasing production per acre as well as per worker; for in agriculture the ability to carry out a given operation, such as plowing, planting, harvesting, or spraying, expeditiously and at exactly the right time can mean a great deal in making the most of good weather, soil, and crop conditions.

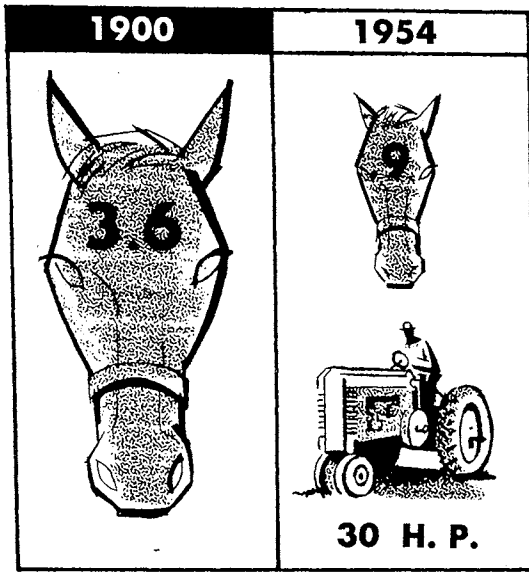
### Comes the harvest.



For the wheat farmer, the harvest is the culmination of the year's effort. Dan West uses his self-propelled combine for this operation and generally rents a second one. This machine takes the place of the reaper or header that cut the standing wheat, the binder that tied it into bundles, and the threshing machine that removed the kernels and winnowed out the chaff. Clanking and whirring over the grain fields like some voracious mechanical monster, it does all these things at one time, and in addition pours the clean kernels into bags or into a truck, and either returns the straw to the field to be disked in or places it in windrows for loading or baling. So the need for harvesting crews and horses and an array of separate machines is eliminated, and the grain comes out cleaner and is likely to be of a higher grade than with the old methods.

The first combines were large and cumbersome. Dan's machine cuts a swath 12 feet wide, or 24 feet for the two machines. With these two machines he figures on harvesting his wheat crop in less than 10 days.

**More power at their command.**



Small combines have now been developed which give the small-scale farmer the advantage of this device, and the machine has also been adapted for use with many other crops besides wheat—notably oats, rye, barley, flax, clovers, alfalfa, grain sorghum, rice, soybeans, and dry beans and peas.

American farmers today probably have more power at their command than has ever been available anywhere for agricultural production, even in ancient empires with myriads of slaves. One result has been that as the work capacity of each farmer increased, so did his need and desire to farm a larger acreage to make effective use of his machines. So the size of farms in this country has been growing. And, by the same token, the big farms, such as that of Dan West, on which machines can be employed to the maximum advantage, have been increasing in number and taking over a larger share of total production. Only one farmer out of 36 in the United States runs an enterprise large enough to market at least \$25,000 worth of products annually. But in 1954, this 2.8 percent had more than 22 percent of the farmland, accounted for 31 percent of the value of all farm products sold, produced 22 percent of the wheat and 38 percent of the cotton, and sold 27 percent of the cattle and calves and 33 percent of all poultry and poultry products.

**A family enterprise.**

But in spite of the steady increase in farm size, it is a striking fact that the family farm is still by all odds the predominant type throughout American agriculture, even in the case of the big operations. Dan West's 1,200 acres is a family farm, and so are most of the other big farms in the region. There is in fact very little corporation farming in the United States and the number of farms run by hired managers is comparatively small. Throughout all the changes that have revolutionized our agriculture, farming has kept its original character as a family enterprise. In fact, this character seems to be more firmly entrenched than ever, in the sense that the proportion of families owning rather than renting their farms has been increasing in recent years, and likewise the proportion of farms free of mortgage debt. In Kansas, for example, the number of farms operated by tenants dropped from a little over 70 thousand in 1940 to about 35 thousand in 1954, and the amount of farm-mortgage loans outstanding January 1, 1955, was 27 percent below the figure for 1940.

**It takes a lot more money nowadays.**

Capital investment per farm: United States	
1954	
Land and buildings.....	\$20,406
Machinery.....	2,986
Livestock.....	2,352
<b>Total.....</b>	<b>25,744</b>
1920	
Land and buildings.....	\$10,285
Machinery.....	558
Livestock.....	1,243
<b>Total.....</b>	<b>12,085</b>

Obviously it takes a lot more money to own a farm and the equipment necessary to run it nowadays than it used to take. In the case of Dan West the investment in land and buildings is close to \$150,000; in machinery, close to \$14,000; and in livestock, close to \$6,500. The average for these items for that size of farm in Dan's area in 1954 was \$170,000. While all farm costs have gone up over a period of several decades, the principal change has been the constant addition of increasing amounts for machinery of one kind or another, so that the trend has been toward a reduction in the relative amounts invested in the land and buildings as compared with mechanical equipment.

Tractors and trucks are not cheap. A large self-propelled combine costs over \$5,000, which is the reason a good many farmers do not buy combines but have their harvesting work done on contract, the main disadvantage being that you can't always have it done just when you want to. In addition to these big items, Dan has a good deal of miscellaneous equipment. He does a careful maintenance job so that his equipment has a relatively long life, but it is expensive just the same.

#### **Operating costs match investment.**

Operating costs also are high to match the investment and the size of the business. In 1954, a farm the size of Dan West's averaged expenditures of \$1,526 for gasoline and oil, \$996 for machine hire, \$1,682 for hired labor, \$761 for commercial fertilizer (this is a new development; commercial fertilizers were not used in this region in the old days), and \$1,690 for livestock feed—despite the fact that Dan raises a great deal of feed of his own. This is a total of \$6,655 for this particular group of expenses. The list is far from complete; it does not include seed, livestock purchased, maintenance and repairs, depreciation, taxes, and interest on loans.

High as the listed costs are, however, they are relatively moderate on a crop-acre basis, amounting to \$1.16 for machine hire, \$1.77 for gasoline and oil, \$1.95 for hired labor, and \$0.88 for fertilizer—a total of \$5.76 per acre. No wheat farmer, no matter what the size of his place, can get along without some of these expenses, and the smaller the farm the higher they run per acre and per dollar of sales. This of course is one of the economic reasons for large-scale operations.

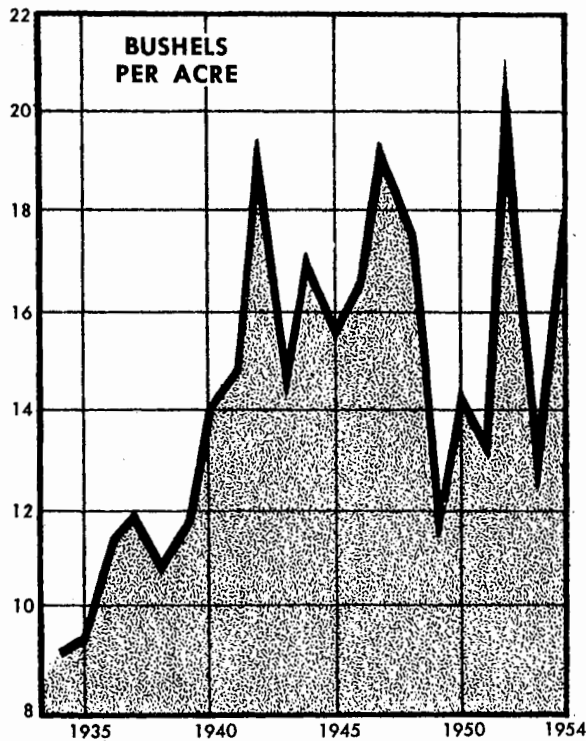
#### **Gross and net income.**

Dan West's gross income in 1954 was \$33,582. Of this, \$27,112 came from the sale of crops, mainly wheat, which brought \$24,889. The sale of livestock and livestock products brought \$6,470. While it is not possible to figure Dan's net income on the basis of data collected by the Census, one might guess that it is probably not over \$6,000. His income situation is probably like that on large-scale farms of all kinds the country over. In 1950, according to a comparative study made by the Census Bureau and the United States Department of Agriculture, the average value of products sold from these large farms (the gross income) was \$54,860, and the average net income of farm-operator families in the group was calculated to be \$8,880, which is 16 percent of the gross income. On the same basis, Dan's net income would be \$5,373.

This analysis of Dan's costs and returns is neither complete nor conclusive; but it is sufficient to bring out some striking facts about his situation and that of other farmers today. He is the extreme case in the sense that he is one of the big operators who, because of the inevitable trend toward machine farming, are responsible, as we have seen, for a large share of modern agricultural production. But despite the size of the operation, his net return is not large in relation to his investment and operating costs.

Lean years and fat years.

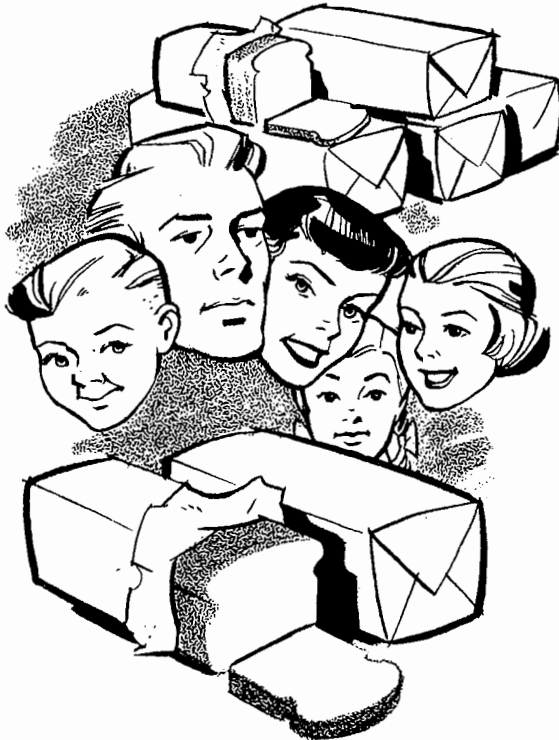
**WHEAT YIELD PER ACRE  
KANSAS: 1934 — 1954**



It is no easy thing to get into farming today ; in fact it is so difficult, from the standpoint of the sum of money involved, that it is a wonder we have as many farmers as we do. Dan is relatively prosperous, and in some years, with the right combination of weather and price, he can make a great deal of money. But in this business of wheat growing in the Great Plains, the lean years are likely to be more numerous than the fat ones. Dan's costs are so high and his production is so comparatively precarious (though not so much so as in the still drier areas) that he must have a reasonable price and a relatively assured market or he will go under.

If we ate as much bread.

**1920 = 4.5 LOAVES**



**1954 = 1.7 LOAVES**

Dan is producing an indispensable food, but one that has been steadily losing ground over a long period of time in its relative importance in our American diet. In 1954, we consumed for food practically the same amount of wheat in this country (474 million bushels) that we consumed nearly a half-century ago in 1910 (478 million bushels). Meanwhile the number of us who shared this 4¾ million bushels, grew from 92 million to 164 million. So each of us ate 137 pounds less of wheat, consuming 173 pounds in 1954 compared with 310 pounds in 1910. Since our total food consumption is about the same, we made up for that 137 pounds by eating mainly more vegetables and fruits and milk. If we ate as much bread now as we did in the old days, we would have required some 850 million bushels in 1954.



**A half million loaves of bread.**

The ability of wheat farmers to produce, however, has been steadily going up with the advance of agricultural technology. Dan West produced 19.7 bushels to the acre in 1954 on his 497 acres. That was a total of 587,500 pounds of wheat, which would yield 423,000 pounds of flour and 164,500 pounds of byproducts for animal feed. Since a pound of flour makes 1½ pounds of bread, Dan's farm contributed the flour for 634,000 one-pound loaves to the United States food supply, plus 82 tons of byproducts for feedstuffs. A half million loaves of bread is a great deal to come off one farm in one year. Dan West can be proud of the achievement. But the sober fact is that the United States has now reached the point where we have a two years' supply of wheat ahead. Over a sufficiently long period of time, the increase in the United States population might more than use up the surplus; but meanwhile the economic problems of wheat farmers justify all the attention and intelligence that can be applied to them.

**Unseen hands and brains.****Dan West's "hired hands."**

The main point about all this—a point not easy to grasp fully—is that not Dan West or any farmer is an independent unit in society in the sense that farmers used to be independent. Not only does he not produce his own food and clothing and much of the material for his shelter as his forebears did; he could in fact not produce at all without the cooperation and assistance of a large number of other people outside agriculture. Dan West could not by his own effort alone produce the basic material for half a million loaves of bread a year. He can perform this prodigious feat only because a great many unseen hands and brains are helping him. These invisible presences are embodied in his machinery, equipment, gasoline, oil, cement, electric lines, etc. They are the brains that invented and continually improve the machines; the hands that make them; the drillers and transporters and refiners of petroleum products that provide the energy for Dan's work; the roadbuilders who enable him to move so much wheat in so short a time; the scientists who experiment endlessly with soils and plants and chemicals; the millers and bakers who turn his raw wheat into edible food; and finally the storekeepers and others who get it effectively into the hands of consumers. The forbears of practically all of them were farmers a few generations ago.

These invisible, unacknowledged presences are in effect Dan West's hired hands. He pays their wages in the cost of his equipment and fuel and other materials. In our society, the distinction between industry and agriculture grows more and more fuzzy as the cooperation this society demands among its various segments becomes increasingly intricate and complete. How many people actually produce Dan West's half-million loaves of bread it would be hard to say, but it takes the work of many more than Dan and Don, and Dan has to pay for all of it from the sale of his wheat.



## POPULAR REPORT

So Dan's problems are not entirely his own and he could not solve them by himself. The problems of the people in production are likewise problems of people in banking and industry and commerce, not to mention consumers. They will never be finally solved, for life itself does not stand still, and in moving forward it creates new problems. Then the new ones have to be solved to make another forward move possible.

### Some wheat in all States.

Before leaving Dan West, we wish to point out that he is only one very small factor in wheat production in this country. A tenth of all the capital invested in land, buildings, livestock, and machinery in our agriculture has been invested by farmers whose main enterprise is wheat production. So Dan's investment is only a drop in this bucket. Though our main wheat belt is in the West, extending from somewhere in Texas all the way to the Canadian border, some wheat is grown in all States. Western production is mainly hard red winter wheat where the climate is suitable for fall planting and hard red spring wheat where the winters are ordinarily too severe for the young plants to survive. Durum wheat, grown for macaroni and similar products, is also produced in the northern section of the wheat belt. Farther west, in Oregon and Washington and parts of California, farmers grow white wheat, which is used mainly for cake and pastry, not bread.

In the eastern part of the United States soft wheat is still grown as a sideline on many farms, but most of the supply comes from commercial producers whose main business is producing wheat.

Just as other kinds of wheat are produced in different parts of the country, so there are many farms producing wheat quite different from that of Dan West. Some, particularly on the West Coast, are much larger than his. Some involve much bigger investments and operating costs. Some produce much more per acre; 30 bushels is not uncommon in western irrigated areas. And of course there are more small farms than there are big ones.