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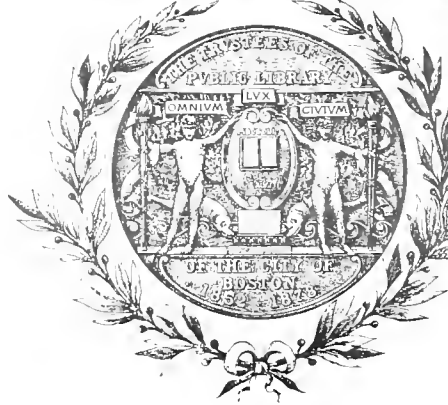


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FARMERS AND FARM PRODUCTION IN THE UNITED STATES

(A COOPERATIVE REPORT)



Wheat Producers and
Wheat Production

SPECIAL REPORTS



1954 Census of Agriculture

U. S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE

WASHINGTON • 1956

U. S. Department of Agriculture
Ezra Taft Benson, Secretary

Agricultural Research Service
Byran T. Shaw, Administrator

U. S. Department of Commerce
Sinclair Weeks, Secretary

Bureau of the Census
Robert W. Burgess, Director

United States Census of Agriculture: 1954

Volume III SPECIAL REPORTS

Part 9

Farmers and Farm Production in the United States (A Cooperative Report)

Chapter I

Wheat Producers and
Wheat Production

CHARACTERISTICS OF FARMERS and FARM PRODUCTION •
PRINCIPAL TYPES OF FARMS •



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PREFACE

The purpose of this report is to present an analysis of the characteristics of farmers and farm production for the most important types of farms as shown by data for the 1954 Census of Agriculture. The analysis deals with the relative importance, pattern of resource use, some measures of efficiency, and problems of adjustment and change for the principal types of farms.

The data given in the various chapters of this report have been derived largely from the special tabulation of data for each type of farm, by economic class, for the 1954 Census of Agriculture. The detailed statistics for each type of farm for the United States and the principal subregions appear in Part 8 of Volume III of the reports for the 1954 Census of Agriculture.

This cooperative report was prepared under the direction of Ray Hurley, Chief of the Agriculture Division of the Bureau of the Census, U. S. Department of Commerce, and Kenneth L. Bachman, Head, Production, Income, and Costs Section, Production Economics Research Branch, Agricultural Research Service of the U. S. Department of Agriculture.

Jackson V. McElveen, Agricultural Economist, Production, Income, and Costs Section, Production Economics Research Branch, Agricultural Research Service of the U. S. Department of Agriculture, supervised a large part of the detailed planning and analysis for the various chapters.

The list of chapters and the persons preparing each chapter are as follows:

Chapter I.....	Wheat Producers and Wheat Production A. W. Epp, University of Nebraska.	Chapter VI	Western Stock Ranches and Livestock Farms Mont H. Saunderson, Western Ranching and Lands Consultant, Bozeman, Mont.
Chapter II.....	Cotton Producers and Cotton Production Robert B. Glasgow, Production Economics Research Branch, Agricultural Research Service, United States Department of Agriculture.	Chapter VII	Cash-grain and Livestock Producers in the Corn Belt Edwin G. Strand, Production Economics Research Branch, Agricultural Research Service, United States Department of Agriculture.
Chapter III.....	Tobacco and Peanut Producers and Production R. E. L. Greene, University of Florida.	Chapter VIII..	Part-time Farming H. G. Halerow, University of Connecticut.
Chapter IV.....	Poultry Producers and Poultry Production William P. Mortenson, University of Wisconsin.	Chapter IX.....	Agricultural Producers and Production in the United States— A General View Jackson V. McElveen, Production Economics Research Branch, Agricultural Research Service, United States Department of Agriculture.
Chapter V.....	Dairy Producers and Dairy Production P. E. McNall, University of Wisconsin.		

The editorial work for this report was performed by Caroline B. Sherman, and the preparation of the statistical tables was supervised by Margaret Wood.

December 1956

UNITED STATES CENSUS OF AGRICULTURE: 1954

REPORTS

Volume I.—Counties and State Economic Areas. Statistics for counties include number of farms, acreage, value, and farm operators; farms by color and tenure of operator; facilities and equipment; use of commercial fertilizer; farm labor; farm expenditures; livestock and livestock products; specified crops harvested; farms classified by type of farm and by economic class; and value of products sold by source.

Data for State economic areas include farms and farm characteristics by tenure of operator, by type of farm, and by economic class.

Volume I is published in 33 parts.

Volume II.—General Report. Statistics by Subjects, United States Census of Agriculture, 1954. Summary data and analyses of the data for States, for Geographic Divisions, and for the United States by subjects.

Volume III.—Special Reports

Part 1.—Multiple-Unit Operations. This report will be similar to Part 2 of Volume V of the reports for the 1950 Census of Agriculture. It will present statistics for approximately 900 counties and State economic areas in 12 Southern States and Missouri for the number and characteristics of multiple-unit operations and farms in multiple units.

Part 2.—Ranking Agricultural Counties. This special report will present statistics for selected items of inventory and agricultural production for the leading counties in the United States.

Part 3.—Alaska, Hawaii, Puerto Rico, District of Columbia, and U. S. Possessions. These areas were not included in the 1954 Census of Agriculture. The available current data from various Government sources will be compiled and published in this report.

Part 4.—Agriculture, 1954, a Graphic Summary. This report will present graphically some of the significant facts regarding agriculture and agricultural production as revealed by the 1954 Census of Agriculture.

Part 5.—Farm-Mortgage Debt. This will be a cooperative study by the Agricultural Research Service of the U. S. Department of Agriculture and the Bureau of the Census. It will present, by States, data based on the 1954 Census of Agriculture and a special mail survey conducted in January 1956, on the number of mortgaged farms, the amount of mortgage debt, and the amount of debt held by principal lending agencies.

Part 6.—Irrigation in Humid Areas. This cooperative report by the Agricultural Research Service of the U. S. Department of Agriculture and the Bureau of the Census will present data obtained by a mail survey of operators of irrigated farms in 28 States on the source of water, method of applying water, number of pumps used, acres of crops irrigated in 1954 and 1955, the number of times each crop was irrigated, and the cost of irrigation equipment and the irrigation system.

Part 7.—Popular Report of the 1954 Census of Agriculture. This report is planned to be a general, easy-to-read publication for the general public on the status and broad characteristics of United States agriculture. It will seek to delineate such aspects of agriculture as the geographic distribution and differences by size of farm for such items as farm acreage, principal crops, and important kinds of livestock, farm facilities, farm equipment, use of fertilizer, soil conservation practices, farm tenure, and farm income.

Part 8.—Size of Operation by Type of Farm. This will be a cooperative special report to be prepared in cooperation with the Agricultural Research Service of the U. S. Department of Agriculture. This report will contain data for 119 economic sub-

regions (essentially general type-of-farming areas) showing the general characteristics for each type of farm by economic class. It will provide data for a current analysis of the differences that exist among groups of farms of the same type. It will furnish statistical basis for a realistic examination of production of such commodities as wheat, cotton, and dairy products in connection with actual or proposed governmental policies and programs.

Part 9.—Farmers and Farm Production in the United States.

The purpose of this report is to present an analysis of the characteristics of farmers and farm production for the most important types of farms as shown by data for the 1954 Census of Agriculture. The analysis deals with the relative importance, pattern of resource use, some measures of efficiency, and problems of adjustment and change for the principal types of farms. The report was prepared in cooperation with the Agricultural Research Service of the U. S. Department of Agriculture.

The list of chapters (published separately only) and title for each chapter are as follows:

Chapter I—*Wheat Producers and Wheat Production*

II—*Cotton Producers and Cotton Production*

III—*Tobacco and Peanut Producers and Production*

IV—*Poultry Producers and Poultry Production*

V—*Dairy Producers and Dairy Production*

VI—*Western Stock Ranches and Livestock Farms*

VII—*Cash-Grain and Livestock Producers in the Corn Belt*

VIII—*Part-Time Farming*

IX—*Agricultural Producers and Production in the United States—A General View*

Part 10.—Use of Fertilizer and Lime. The purpose of this report is to present in one publication most of the detailed data compiled for the 1954 Census of Agriculture regarding the use of fertilizer and lime. The report presents data for counties, State economic areas, and generalized type-of-farming areas regarding the quantity used, acreage on which used, and expenditures for fertilizer and lime. The Agricultural Research Service cooperated with the Bureau of the Census in the preparation of this report.

Part 11.—Farmers' Expenditures. This report presents detailed data on expenditures for a large number of items used for farm production in 1955, and on the living expenditures of farm operators' families. The data were collected and compiled cooperatively by the Agricultural Marketing Service of the U. S. Department of Agriculture and the Bureau of the Census.

Part 12.—Methods and Procedures. This report contains an outline and a description of the methods and procedures used in taking and compiling the 1954 Census of Agriculture.

INTRODUCTION

ECONOMIC SUBREGIONS AND STATE ECONOMIC AREAS



INTRODUCTION

Purpose and scope.—American agriculture is exceedingly diverse and is undergoing revolutionary changes. Farmers and their families obtain their income by producing a large variety of products under a large variety of conditions as well as from sources other than farming. The organization of production, type of farming, productivity, income, expenditures, size, and characteristics of operators of the 4.8 million farms in the United States vary greatly. Agriculture has been a dynamic, moving, adjusting part of our economy. Basic changes in farming have been occurring and will continue to be necessary. Adjustments brought by technological change, by changing consumer wants, by growth of population, and by changes in the income of nonfarm people, have been significant forces in changing agriculture since World War II. The transition from war to an approximate peacetime situation has also made it necessary to reduce the output of some farm products. Some of the adjustments in agriculture have not presented relatively difficult problems as they could be made by the transfer of resources from the production of one product to another. Others require substantial shifts in resources and production.

Moreover, a considerable number of farm families, many of whom are employed full time in agriculture, have relatively low incomes. Most of these families operate farms that are small when compared with farms that produce higher incomes. The acreage of land and the amount of capital controlled by the operators of these small farms are too small to provide a very high level of income. In recent years, many farm families on these small farms have made adjustments by leaving the farm to earn their incomes elsewhere, by discontinuing their farm operations, and by earning more non-farm income while remaining on the farm or on the place they farmed formerly.

One objective of this report is to describe and analyze some of the existing differences and recent adjustments in the major types of farming and farm production. For important commodities and groups of farms, the report aims to make available, largely from the detailed data for the 1954 Census of Agriculture but in a more concise form, facts regarding the size of farms, capital, labor, and land resources on farms, amounts and sources of farm income and expenditures, combinations of crop and livestock enterprises, adjustment problems, operator characteristics, and variation in use of resources and in size of farms by areas and for widely differing production conditions. Those types of farms on which production of surplus products is important have been emphasized. The report will provide a factual basis for a better understanding of the widespread differences among farms in regard to size, resources, and income. It will also provide a basis for evaluating the effects of existing and proposed farm programs on the production and incomes of major types and classes of farms.

Income from nonfarm sources is important on a large number of farms. About 1.4 million of the 4.8 million farm-operator families, or about 3 in 10, obtain more income from off-farm sources than from the sale of agricultural products. More than three-fourths of a million farm operators live on small-scale part-time farms and ordinarily are not dependent on farming as the main source of family income. These part-time farmers have a quite different relation to adjustments, changes, and farm problems than do commercial farmers. A description of and facts regarding these part-time farms and the importance of nonfarm income for commercial farms are presented in Chapter 8.

Except for Chapter 8, this report deals with commercial farms (see economic class of farm). The analysis is limited to the major types of agricultural production and deals primarily with geographic areas in which each of the major types of agricultural production has substantial significance.

Source of data.—Most of the data presented in this report are from special compilations made for the 1954 Census of Agriculture, although pertinent data from research findings and surveys of the U. S. Department of Agriculture, State Agricultural Colleges, and other agencies have been used to supplement Census data. The detailed Census data used for this report are contained in Part 8 of Volume III of the reports of the 1954 Census of Agriculture. Reference should be made to that report for detailed explanations and definitions and statements regarding the characteristics and reliability of the data.

Areas for which data are presented.—Data are presented in this report primarily for selected economic subregions and for the United States. The boundaries of the 119 subregions used for the compilation of data on which this report is based are indicated by the map on page vi. These subregions represent primarily general type-of-farming areas. Many of them extend into two or more States. (For a more detailed description of economic subregions, see the publication "Economic Subregions of the United States, Series Census BAE; No. 19, published cooperatively by the Bureau of the Census, and the Bureau of Agricultural Economics, U. S. Department of Agriculture, July 1953.)

DEFINITIONS AND EXPLANATIONS

Definitions and explanations are given only for some of the more important items. For more detailed definitions and explanations, reference can be made to Part 8 of Volume III and to Volume II of the reports of the 1954 Census of Agriculture.

A farm.—For the 1954 Census of Agriculture, places of 3 or more acres were counted as farms if the annual value of agricultural products, exclusive of home-garden products, amounted to \$150 or more. The agricultural products could have been either for home use or for sale. Places of less than 3 acres were counted as farms only if the annual value of sales of agricultural products amounted to \$150 or more. Places for which the value of agricultural products for 1954 was less than these minima because of crop failure or other unusual conditions, and places operated at the time of the Census for the first time were counted as farms if normally they could be expected to produce these minimum quantities of agricultural products.

All the land under the control of one person or partnership was included as one farm. Control may have been through ownership, or through lease, rental, or cropping arrangement.

Farm operator.—A "farm operator" is a person who operates a farm, either performing the labor himself or directly supervising it. He may be an owner, a hired manager, or a tenant, renter, or sharecropper. If he rents land to others or has land cropped for him by others, he is listed as the operator of only that land which he retains. In the case of a partnership, only one partner was included as the operator. The number of farm operators is considered the same as the number of farms.

Farms reporting or operators reporting.—Figures for farms reporting or operators reporting, based on a tabulation of all farms, represent the number of farms, or farm operators, for which the specified item was reported. For example, if there were 11,922 farms in a subregion and only 11,465 had chickens over 4 months old on hand, the number of farms reporting chickens would be 11,465. The difference between the total number of farms and the number of farms reporting an item represents the number of farms not having that item, provided the inquiry was answered completely for all farms.

Farms by type.—The classification of commercial farms by type was made on the basis of the relationship of the value of sales from a particular source, or sources, to the total value of all farm products sold from the farm. In some cases, the type of farm was determined on the basis of the sale of an individual farm product, such as cotton, or on the basis of the sales of closely related products, such as dairy products. In other cases, the type of farm was determined on the basis of sales of a broader group of products, such as grain crops including corn, sorghums, all small grains, field peas, field beans, cowpeas, and soybeans. In order to be classified as a particular type, sales or anticipated sales of a product or group of products had to represent 50 percent or more of the total value of products sold.

The types of commercial farms for which data are shown, together with the product or group of products on which the classification is based are:

<i>Type of farm</i>	<i>Product or group of products amounting to 50 percent or more of the value of all farm products sold</i>
Cash-grain.....	Corn, sorghum, small grains, field peas, field beans, cowpeas, and soybeans.
Cotton.....	Cotton (lint and seed).
Other field-crop.....	Peanuts, Irish potatoes, sweet-potatoes, tobacco, sugarcane, sugar beets for sugar, and other miscellaneous crops.
Vegetable.....	Vegetables.
Fruit-and-nut.....	Berries and other small fruits, and tree fruits, nuts, and grapes.
Dairy.....	Milk and other dairy products. The criterion of 50 percent of the total sales was modified in the case of dairy farms. A farm for which the value of sales of dairy products represented less than 50 percent of the total value of farm products sold was classified as a dairy farm if— (a) Milk and other dairy products accounted for 30 percent or more of the total value of products sold, and (b) Milk cows represented 50 percent or more of all cows, and (c) Sales of dairy products, together with the sales of cattle and calves, amounted to 50 percent or more of the total value of farm products sold.
Poultry.....	Chickens, eggs, turkeys, and other poultry products.
Livestock farms other than dairy and poultry.	Cattle, calves, hogs, sheep, goats, wool, and mohair, provided the farm did not qualify as a dairy farm.

<i>Type of farm</i>	<i>Product or group of products amounting to 50 percent or more of the value of all farm products sold</i>
General.....	Farms were classified as general when the value of products from one source or group of sources did not represent as much as 50 percent of the total value of all farm products sold. Separate figures are given for three kinds of general farms: (a) Primarily crop. (b) Primarily livestock. (c) Crop and livestock. <i>Primarily crop</i> farms are those for which the sale of one of the following crops or groups of crops—vegetables, fruits and nuts, cotton, cash grains, or other field crops—did not amount to 50 percent or more of the value of all farm products sold, but for which the value of sales for all these groups of crops represented 70 percent or more of the value of all farm products sold. <i>Primarily livestock</i> farms are those which could not qualify as dairy farms, poultry farms, or livestock farms other than dairy and poultry, but on which the sale of livestock and poultry and livestock and poultry products amounted to 70 percent or more of the value of all farm products sold. <i>General crop and livestock</i> farms are those which could not be classified as either crop farms or livestock farms, but on which the sale of all crops amounted to at least 30 percent but less than 70 percent of the total value of all farm products sold.
Miscellaneous.....	This group of farms includes those that had 50 percent or more of the total value of products accounted for by sale of horticultural products, or sale of horses, or sale of forest products.

Farms by economic class.—A classification of farms by economic class was made for the purpose of segregating groups of farms that are somewhat alike in their characteristics and size of operation. This classification was made in order to present an accurate description of the farms in each class and in order to provide basic data for an analysis of the organization of agriculture.

The classification of farms by economic class was made on the basis of three factors; namely, total value of all farm products sold, number of days the farm operator worked off the farm, and the relationship of the income received from nonfarm sources by the operator and members of his family to the value of all farm products sold. Farms operated by institutions, experiment stations, grazing associations, and community projects were classified as abnormal, regardless of any of the three factors.

For the purpose of determining the code for economic class and type of farm, it was necessary to obtain the total value of farm products sold as well as the value of some individual products sold.

The total value of farm products sold was obtained by adding the reported or estimated values for all products sold from the farm. The value of livestock, livestock products except wool and mohair, vegetables, nursery and greenhouse products, and forest

products was obtained by the enumerator from the farm operator for each farm. The enumerator also obtained from the farm operator the quantity sold for corn, sorghums, small grains, hays, and small fruits. The value of sales for these crops was obtained by multiplying the quantity sold by State average prices.

The quantity sold was estimated for all other farm products. The entire quantity produced for wool, mohair, cotton, tobacco, sugar beets for sugar, sugarcane for sugar, broomcorn, hops, and mint for oil was estimated as sold. To obtain the value of each product sold, the quantity sold was multiplied by State average prices.

In making the classification of farms by economic class, farms were grouped into two major groups, namely, commercial farms and other farms. In general, all farms with a value of sales of farm products amounting to \$1,200 or more were classified as commercial. Farms with a value of sales of \$250 to \$1,199 were classified as commercial only if the farm operator worked off the farm less than 100 days or if the income of the farm operator and members of his family received from nonfarm sources was less than the total value of all farm products sold.

Land in farms according to use.—Land in farms was classified according to the use made of it in 1954. The classes of land are mutually exclusive, i. e., each acre of land was included only once even though it may have had more than one use during the year.

The classes referred to in this report are as follows:

Cropland harvested.—This includes land from which crops were harvested; land from which hay (including wild hay) was cut; and land in small fruits, orchards, vineyards, nurseries, and greenhouses. Land from which two or more crops were reported as harvested was to be counted only once.

Cropland used only for pasture.—In the 1954 Census, the enumerator's instructions stated that rotation pasture and all other cropland that was used only for pasture were to be included under this class. No further definition of cropland pastured was given the farm operator or enumerator. Permanent open pasture may, therefore, have been included under this item or under "other pasture," depending on whether the enumerator or farm operator considered it as cropland.

Cropland not harvested and not pastured.—This item includes idle cropland, land in soil-improvement crops only, land on which all crops failed, land seeded to crops for harvest after 1954, and cultivated summer fallow.

In the Western States, this class was subdivided to show separately the acres of cultivated summer fallow. In these States, the acreage not in cultivated summer fallow represents largely crop failure. There are very few counties in the Western States in which there is a large acreage of idle cropland or in which the growing of soil-improvement crops is an important use of the land.

In the States other than the Western States, this general class was subdivided to show separately the acres of idle cropland (not used for crops or for pasture in 1954). In these States, the incidence of crop failure is usually low. It was expected that the acreage figure that excluded idle land would reflect the acreage in soil-improvement crops. However, the 1954 crop year was one of low rainfall in many Eastern and Southern States and, therefore, in these areas the acreage of cropland not harvested and not pastured includes more land on which all crops failed than would usually be the case.

Cultivated summer fallow.—This item includes cropland that was plowed and cultivated but left unseeded for several months to control weeds and conserve moisture. No land from which crops were harvested in 1954 was to be included under this item.

Cropland, total.—This includes cropland harvested, cropland used only for pasture, and cropland not harvested and not pastured.

Land pastured, total.—This includes cropland used only for pasture, woodland pastured, and other pasture (not cropland and not woodland).

Woodland, total.—This includes woodland pastured and woodland not pastured.

Value of land and buildings.—The value to be reported was the approximate amount for which the land and the buildings on it would sell.

Off-farm work and other income.—Many farm operators receive a part of their income from sources other than the sale of farm products from their farms. The 1954 Agriculture Questionnaire included several inquiries relating to work off the farm and non-farm income. These inquiries called for the number of days worked off the farm by the farm operator; whether other members of the operator's family worked off the farm; and whether the farm operator received income from other sources, such as sale of products from land rented out, cash rent, boarders, old age assistance, pensions, veterans' allowances, unemployment compensation, interest, dividends, profits from nonfarm business, and help from other members of the operator's family. Another inquiry asked whether the income of the operator and his family from off-farm work and other sources was greater than the total value of all agricultural products sold from the farm in 1954. Off-farm work was to include work at nonfarm jobs, businesses, or professions, whether performed on the farm premises or elsewhere; also, work on someone else's farm for pay or wages. Exchange work was not to be included.

Specified facilities and equipment.—Inquiries were made in 1954 to determine the presence or absence of selected items on each place such as (1) telephone, (2) piped running water, (3) electricity, (4) television set, (5) home freezer, (6) electric pig brooder, (7) milking machine, and (8) power feed grinder. Such facilities or equipment were to be counted even though temporarily out of order. Piped running water was defined as water piped from a pressure system or by gravity flow from a natural or artificial source. The enumerator's instructions stated that pig brooders were to include those heated by an electric heating element, by an infrared or heat bulb, or by ordinary electric bulbs. They could be homemade.

The number of selected types of other farm equipment was also obtained for a sample of farms. The selected kinds of farm equipment to be reported were (1) grain combines (for harvesting and threshing grains or seeds in one operation); (2) cornpickers; (3) pickup balers (stationary ones not to be reported); (4) field forage harvesters (for field chopping of silage and forage crops); (5) motortrucks; (6) wheel tractors (other than garden); (7) garden tractors; (8) crawler tractors (tracklaying, caterpillar); (9) automobiles; and (10) artificial ponds, reservoirs, and earth tanks.

Wheel tractors were to include homemade tractors but were not to include implements having built-in power units such as self-propelled combines, powered buck rakes, etc. Pickup and truck-trailer combinations were to be reported as motortrucks. School buses were not to be reported, and jeeps and station wagons were to be included as motortrucks or automobiles, depending on whether used for hauling farm products or supplies, or as passenger vehicles.

Farm labor.—The farm-labor inquiries for 1954, called for the number of persons doing farmwork or chores on the place during a specified calendar week. Since starting dates of the 1954 enumeration varied by areas or States, the calendar week to which the farm-labor inquiries related varied also. The calendar week was September 26–October 2 or October 24–30. States with the September 26–October 2 calendar week were: Arizona, California, Colorado, Connecticut, Florida, Idaho, Kansas, Kentucky, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico,

New York, North Dakota, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Tennessee, Texas, Utah, Vermont, Washington, Wisconsin, and Wyoming. States with the October 24-30 calendar week were: Alabama, Arkansas, Delaware, Georgia, Illinois, Indiana, Iowa, Maryland, Mississippi, Missouri, North Carolina, Ohio, South Carolina, Virginia, and West Virginia. Farmwork was to include any work, chores, or planning necessary to the operation of the farm or ranch business. Housework, contract construction work, and labor involved when equipment was hired (custom work) were not to be included.

The farm-labor information was obtained in three parts: (1) Operators working, (2) unpaid members of the operator's family working, and (3) hired persons working. Operators were considered as working if they worked 1 or more hours; unpaid members of the operator's family, if they worked 15 or more hours; and hired persons, if they worked any time during the calendar week specified. Instructions contained no specifications regarding age of the persons working.

Regular and seasonal workers.—Hired persons working on the farm during the specified week were classed as "regular" workers if the period of actual or expected employment was 150 days or more during the year, and as "seasonal" workers if the period of actual or expected employment was less than 150 days. If the period of expected employment was not reported, the period of employment was estimated for the individual farm after taking into account such items as the basis of payment, wage rate, expenditures for labor in 1954, and the type and other characteristics of the farm.

Specified farm expenditures.—The 1954 Census obtained data for selected farm expense items in addition to those for fertilizer and lime. The expenditures were to include the total specified expenditures for the place whether made by landlord, tenant, or both.

Expenditures for machine hire were to include any labor included in the cost of such machine hire. Machine hire refers to custom machine work such as tractor hire, threshing, combining, silo filling, baling, ginning, plowing, and spraying. If part of the farm products was given as pay for machine hire, the value of the products traded for this service was to be included in the amount of expenditures reported. The cost of trucking, freight, and express was not to be included.

Expenditures for hired labor were to include only cash payments. Expenditures for housework, custom work, and contract construction work were not to be included.

Expenditures for feed were to include the expenditures for pasture, salt, condiments, concentrates, and mineral supplements, as well as those for grain, hay, and mill feeds. Expenditures for grinding and mixing feeds were also to be included. Payments made by a tenant to his landlord for feed grown on the land rented by the tenant were not to be included.

Expenditures for gasoline and other petroleum fuel and oil were to include only those used for the farm business. Petroleum products used for the farmer's automobile for pleasure or used exclusively in the farm home for heating, cooking, and lighting were not to be included.

Crops harvested.—The information on crops harvested refers to the acreage and quantity harvested for the 1954 crop year. An exception was made for land in fruit orchards and planted nut trees. In this case, the acreage represents that in both bearing and nonbearing trees and vines as of October and November 1954.

Hay.—The data for hay includes all kinds of hay except soybean, cowpea, sorghum, and peanut hay.

Livestock and poultry.—The data on the number of livestock and poultry represent the number on hand on the day of enumera-

tion (October-November 1954). The data relating to livestock products and the number of livestock sold relate to the sales made during the calendar year 1954.

LABOR RESOURCES

The data for labor resources available represent estimates based largely on Census data and developed for the purpose of making comparisons among farms of various size of operations. The labor resources available are stated in terms of man-equivalents.

To obtain the man-equivalents the total number of farm operators as reported by the 1954 Census were adjusted for estimated man-years of work off the farm and for the number of farm operators 65 years old and over. The farm operator was taken to represent a full man-equivalent of labor unless he was 65 years or older or unless he worked at an off-farm job in 1954.

The man-equivalent estimated for farm operators reporting specified amounts of off-farm work were as follows:

<i>Days worked off the farm in 1954</i>	<i>Estimated man-equivalent</i>
1-99 days.....	0.85
100-199 days.....	.50
200 days and over.....	.15

The man-equivalent for farm operators 65 years of age and older was estimated at 0.5.

Man-equivalents of members of the farm operator's family were based upon Census data obtained in response to the question "How many members of your family did 15 or more hours of farm work on this place the week of September 26-October 2 (or, in some areas, the week of October 24-30) without receiving cash wages?" Each family worker was considered as 0.5 man-equivalent. This estimate provides allowance for the somewhat higher incidence of women, children, and elderly persons in the unpaid family labor force.

In addition, the number of unpaid family workers who were reported as working 15 or more hours in the week of September 26-October 2 was adjusted to take account of seasonal changes in farm employment. Using published and unpublished findings of the U. S. Department of Agriculture and State Agricultural Colleges, and depending largely upon knowledge and experience with the geographic areas and type of farming, each author determined the adjustment factor needed to correct the number of family workers reported for the week of September 26-October 2 to an annual average basis.

Man-equivalents of hired workers are based entirely upon the expenditure for cash wages and the average wage of permanent hired laborers as reported in the 1954 Census of Agriculture.

Value of or investment in livestock.—Numbers of specified livestock and poultry in each subregion were multiplied by a weighted average value per head. The average values were computed from data compiled for each kind of livestock for the 1954 Census of Agriculture. The total value does not include the value of goats. (For a description of the method of obtaining the value of livestock, see Chapter VI of Volume II of the reports for the 1954 Census of Agriculture.)

Value of investment in machinery and equipment.—The data on value of investment in machinery and equipment were developed for the purpose of making broad comparisons among types and economic classes of farms and by subregions. Numbers of specified machines on farms, as reported by the Census, were multiplied by estimated average value per machine. Then the total values obtained were adjusted upward to provide for the inclusion of items of equipment not included in the Census inventory of farm machinery.

The estimates for average value of specified machines and the proportion of total value of all machinery represented by the value of these machines were based largely on published and unpublished data from the "Farm Costs and Returns" surveys conducted currently by the Agricultural Research Service, U. S. Department of Agriculture.¹ Modifications were made as needed in the individual chapters on the basis of State and local studies. The total estimated value of all machinery for all types and economic classes of farms is approximately equal to the value of all machinery as estimated by the U. S. Department of Agriculture.

Value of farm products sold, or gross sales.—Data on the value of the various farm products sold were obtained for 1954 by two methods. First, the values of livestock and livestock products sold, except wool and mohair; vegetables harvested for sale; nursery and greenhouse products; and forest products were obtained by asking each farm operator the value of sales. Second, the values of all other farm products sold were computed. For the most important crops, the quantity sold or to be sold was obtained for each farm. The entire quantity harvested for cotton and cottonseed, tobacco, sugar beets for sugar, hops, mint for oil, and sugarcane for sugar was considered sold. The quantity of minor crops sold was estimated. The value of sales for each crop was computed by multiplying the quantity sold by State average prices. In the case of wool and mohair, the value of sales was computed by multiplying the quantity shorn or clipped by the State average prices.

Gross sales include the value of all kinds of farm products sold. The total does not include rental and benefit, soil conservation, price adjustment, Sugar Act, and similar payments. The total

does include the value of the landlord's share of a crop removed from a farm operated by a share tenant. In most of the tables, detailed data are presented for only the more important sources of gross sales and the total for the individual farm products or sources will not equal the total as the values for the less important sources or farm products have been omitted. (For a detailed statement regarding the reliability and method of obtaining the value of farm products sold, reference should be made to Chapter IX of Volume II of the reports for the 1954 Census of Agriculture.)

Livestock and livestock products sold.—The value of sales for livestock and livestock products includes the value of live animals sold, dairy products sold, poultry and poultry products sold, and the calculated value of wool and mohair. The value of bees, honey, fur animals, goats, and goat milk is not included.

The value of dairy products includes the value of whole milk and cream sold, but does not include the value of butter and cheese, made on the farm, and sold. The value of poultry and products includes the value of chickens, broilers, chicken eggs, turkeys, turkey eggs, ducks, geese, and other miscellaneous poultry and poultry products sold. The value does not include the value of baby chicks sold.

Crops sold.—Vegetables sold includes the value of all vegetables harvested for sale, but does not include the value of Irish potatoes and sweet potatoes.

The value of all crops sold includes the value of all crops sold except forest products. The value of field crops sold includes the value of sales of all crops sold except vegetables, small fruits and berries, fruits, and nuts.

¹ Farm Costs and Returns, 1955 (with comparisons), Agriculture Information Bulletin No. 158, Agricultural Research Service, U. S. Department of Agriculture, June 1956.

CHAPTER I
WHEAT PRODUCERS AND WHEAT PRODUCTION

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WHEAT PRODUCERS AND WHEAT PRODUCTION

A. W. EPP

INTRODUCTION

American wheat producers represent an important and distinct segment of our agricultural economy. Nearly a million of the 4.8 million farmers in the United States produce some wheat. Some wheat is grown in all States (see fig. 1), and in 1954, it occupied 51.4 million acres or 15.4 percent of the cropland harvested. Its relative importance in various areas is shown by the proportion of cropland occupied by wheat (see fig. 2). Total wheat production has approximated 1 billion bushels or more in each of the last 15 years with a peak production of 1,359 million bushels in 1947. The 1954 crop of 909 million bushels had a farm value of \$1,940 million. This was approximately 8 percent of gross farm sales in the United States.

Two-thirds of the wheat is grown on relatively specialized farms on which wheat is the major product. These farms are particularly affected by changes in weather conditions and in economic programs that affect wheat. Operators of cash-grain farms harvesting wheat used 34 million acres of cropland or 10.7 percent of the United States total, in the production of wheat in 1954. They had invested \$25.7 billion in land, buildings, livestock, and machinery, or about 23 percent of the total capital investment in agriculture. These wheat farmers used 13 percent of the total agricultural labor force.

In addition, many other farmers with diversified types of farming use a part of their resources to produce some wheat.

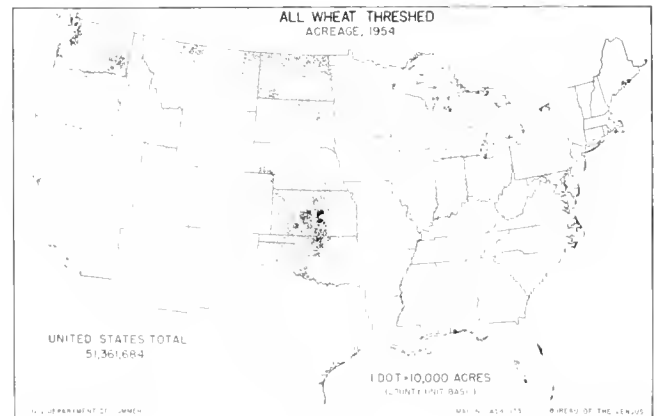


FIGURE 1.

Public interest in wheat producers is stimulated by the demand-supply situation in wheat and the difficulties of making necessary adjustments. The major concern in agricultural programs and price policy for wheat growers for more than 30 years has been the problem of adjusting the quantity produced to the quantity consumed (see fig. 3).

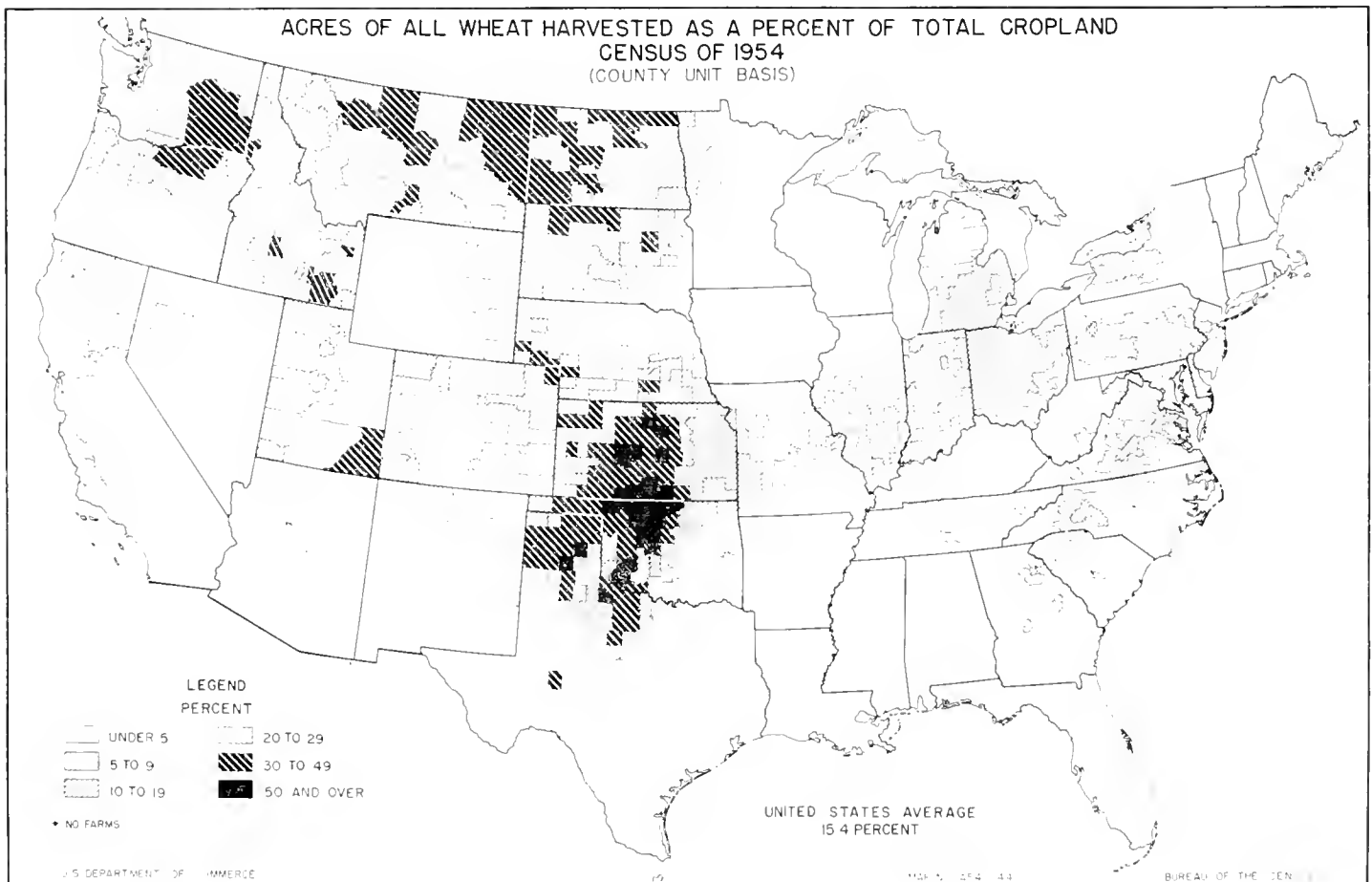


FIGURE 2.

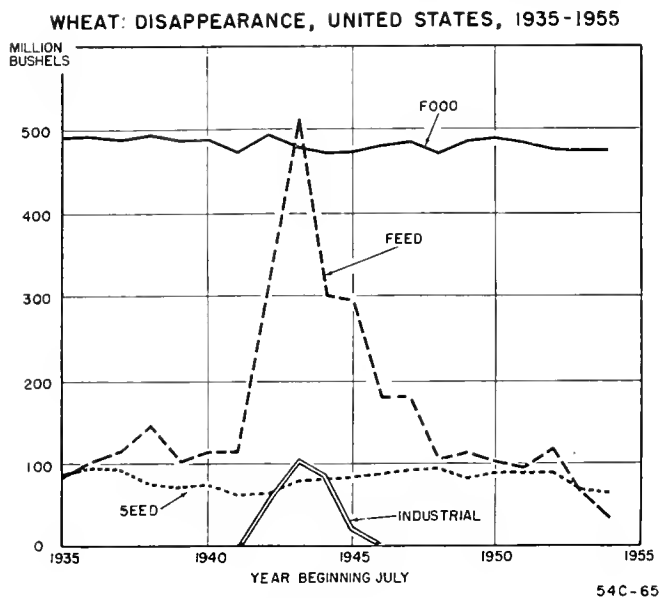


FIGURE 3.

Food habits have changed over the years. The American people have reduced their consumption of the starchy foods such as bread and potatoes. The annual consumption of wheat has declined from 310 pounds per capita in 1910 to 173 pounds in 1954, but the

increase in population has offset this decrease so that total consumption has remained rather constant. (See table 1.)

Wheat is tolerant of a wide range of growing conditions. Ideal conditions for wheat production are a deep, fertile, fine-textured soil, cool temperatures and ample rainfall during the growing season, with warm dry weather during the final period of maturing and harvest. Wheat plants respond readily to favorable moisture conditions but will survive and produce grain with as little as 10 inches of rainfall. Most wheat is grown in areas of less than 50 inches annual rainfall. When wheat is grown in areas of less than 20 inches of yearly precipitation, it is a common practice to summer-fallow at least a part of the wheatland. The purpose of fallowing is to kill weeds, to keep the surface in as permeable condition as possible for the absorption of water, and help to control wind erosion. Many wheat growers in the low-rainfall areas have half of their cropland in wheat and the other half in fallow. A comparison of figures 1, 4, and 5 will show the relation of annual precipitation and summer-fallowing to the areas of wheat production.

Table 1.—TOTAL AND PER-CAPITA CONSUMPTION OF WHEAT FOR FOOD IN THE UNITED STATES:¹ 1910 TO 1954

Year	Total	Per capita	Year	Total	Per capita
	<i>Million bushels</i>	<i>Pounds</i>		<i>Millions bushels</i>	<i>Pounds</i>
1910.....	478	310	1940.....	484	217
1920.....	466	259	1950.....	481	186
1930.....	506	243	1954.....	474	173

¹ Source: Agricultural Marketing Service, U. S. Department of Agriculture.

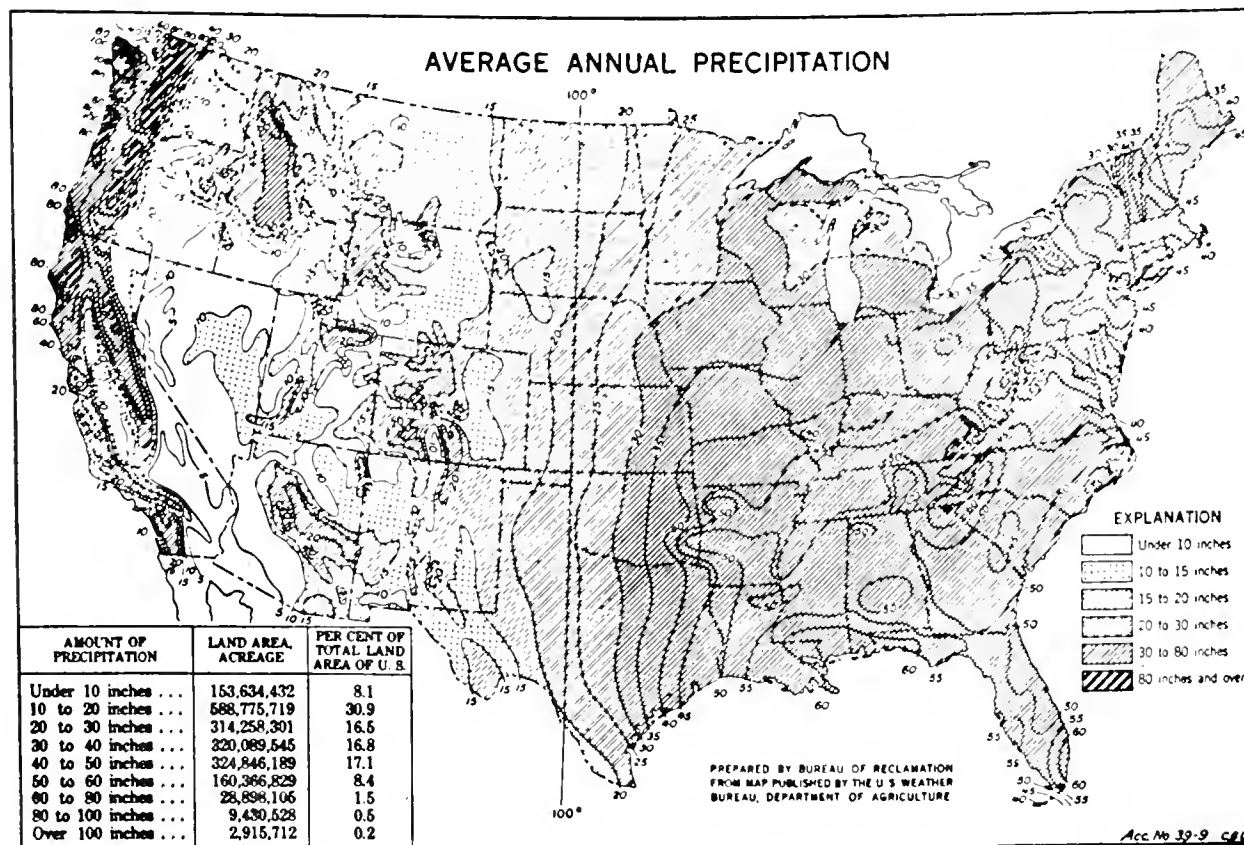


FIGURE 4.

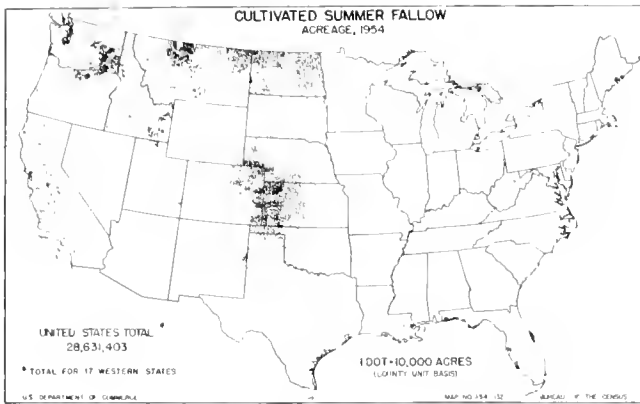


FIGURE 5.

The adaptation of wheat to a wide range of climatic conditions also contributes to the difficulty of limiting the supply. Acreage reductions in recognized commercial wheat areas may be offset by increases in wheat acreage in other areas where it can be grown fairly successfully.

The lack of production alternatives in the major wheat regions intensifies the difficulty of adjusting supply to demand. There are few good alternative uses for the land. It is difficult to get grasses established, and if a shift to livestock production is undertaken, the income is often reduced and any increase in the total farm income may be delayed for several years.

There is great variation in the acreage planted to wheat. It has varied from 50 million to 84 million acres during the last 45 years. The harvested acreage is somewhat less because of abandonment. Each year some seeded wheat acreage is abandoned because conditions are unfavorable for its growth. Winterkill because of drought conditions is the most frequent cause.

The production fluctuates as well as the acreage seeded. The average yield in the United States has varied from 12 to 19 bushels per acre harvested. On a seeded-acre basis, yields dropped as low as 8 bushels during several years of the drought of the 1930's. The acreage harvested, yield, production, and value of the wheat crop during nearly 50 years are shown in table 4. Production has varied from as low as 526 million to a high of 1,359 million bushels. Obviously, the fluctuation in acreage planted and in yield per acre results in considerable variation in annual production.

In recent years wheat supplies have been increasing. The supply of wheat in the United States by source is as follows, for the 5 years, 1950-54:

Item	1950	1951	1952	1953	1954
Production.....	<i>Mil. bu.</i> 1,019	<i>Mil. bu.</i> 981	<i>Mil. bu.</i> 1,299	<i>Mil. bu.</i> 1,170	<i>Mil. bu.</i> 970
Imports.....	12	32	21	6	4
Stocks, July 1.....	425	396	256	562	902
Total supply.....	1,456	1,409	1,576	1,738	1,876

Stocks of wheat have accumulated so that we now have practically 2 years' total requirements on hand at the beginning of each harvest. A part of the problem of oversupply rises out of the extent of the acreage seeded to wheat in response to wartime demand. During both World War I and World War II adequate

supplies of food were essential. Prices of wheat and other foods increased rapidly. Farmers responded by plowing up grassland and increasing the wheat acreage by thousands of acres. The readjustment of this acreage to normal demands for wheat is more difficult than the expansion. In the Great Plains area it is difficult and costly to establish grass on cropland. A few years of good grain crops and high prices raise the hopes of farmers for high profits from wheat, and make them reluctant to seed the land to grass.

In 1954 farmers voted in favor of marketing quotas. Carryover stocks of wheat had mounted from a quarter of a billion bushels in 1952 to nearly a billion bushels in July 1954. Continued production at existing levels was not consistent with market demand conditions and price supports of more than \$2 per bushel for wheat, largely, as a result of acreage controls and marketing quotas, wheat acreage harvested was reduced from 68 million in 1953 to less than 55 million in 1954. Farmers again voted in favor of marketing quotas in 1955 and 1956.

Table 2.—ACREAGE, PRODUCTION, AND VALUE OF WHEAT IN THE UNITED STATES: 1910 TO 1954¹

Year	Harvested acreage	Yield per acre	Production	Average price	Farm value
	<i>Thousands</i>	<i>Bushels</i>	<i>Million bushels</i>	<i>Per bushel</i>	<i>Million dollars</i>
1954.....	53,712	18.1	970	\$2.13	\$2,063
1953.....	67,661	17.3	1,169	2.04	2,385
1952.....	70,926	18.3	1,299	2.09	2,714
1951.....	61,192	16.0	981	2.11	2,074
1950.....	61,610	16.5	1,019	2.00	2,042
1949.....	75,910	14.5	1,098	1.88	2,062
1945.....	65,167	17.0	1,108	1.50	1,661
1940.....	53,273	15.3	815	.68	556
1930.....	62,637	14.2	887	.67	595
1920.....	62,358	13.5	843	1.83	1,541
1910.....	45,793	13.7	625	.91	565

¹ Agricultural Statistics, U. S. Department of Agriculture.

CLASSES OF WHEAT

Wheat is not the homogeneous product implied in some of the discussion of the problems of wheat farmers and farm programs. Several distinct classes of wheat are produced in this country. Each class is grown for a specific use, and is used in a limited number of products. The classes vary in their characteristics. Although there is a considerable overlapping in production areas, the classes of wheat are grown in fairly distinct areas. To a large extent the class produced in an area is greatly influenced by the climatic conditions.

Hard red winter and hard red spring wheats differ mainly in their habits of growth. In the areas where either kind can be grown, winter wheat usually produces a higher yield. These hard wheats are commonly used for the kind of bread flour that requires a high-protein grain. Flour from soft red wheat is especially suited for baking biscuits, pastry, and cakes, as these products require flour with a relatively low protein content.

White wheat, grown in the western and northeastern parts of the United States, is a soft wheat; it is used for pastries and cereals. Durum wheat is a very hard wheat that is grown in the spring wheat regions. It makes a very tough dough used in making macaroni, spaghetti, vermicelli, and noodles. Red durum wheat is grown mainly for livestock feed. The supply and distribution of wheat by classes is shown in table 3.

WHEAT PRODUCTION REGIONS

Wheat production in the United States can be separated into two general production situations. In the western half of the country there are extensive areas of specialized cash-grain farming where wheat is the dominant crop (see fig. 6). While some wheat is grown in all of the Western States, production is concentrated in three major regions. These three major regions, characterized by specialization and large acreages of wheat, account for about half of the total production of wheat. Nearly all of this production occurs on commercial farms. In addition, some wheat is grown in other scattered areas of the West.

In the eastern half of the United States wheat is generally a minor farm enterprise. Here wheat usually is grown in a diversified type of farming where wheat typically is a minor source of income.

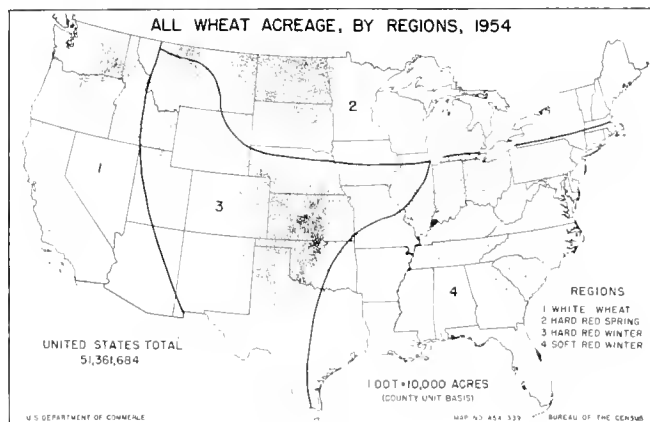


FIGURE 6.

Table 3.—ESTIMATED SUPPLY AND DOMESTIC USE OF WHEAT BY CLASSES: 1954-55¹

Class	Supply	Domestic use
	Million bushels	Million bushels
Hard red winter.....	1,018	225
Soft red winter.....	271	159
Hard red spring.....	338	140
Durum.....	10	8
White.....	254	55

¹ 12 months beginning July 1, 1954.

Source: Agricultural Marketing Service, U. S. Department of Agriculture.

In this report, soft winter wheat production in the eastern half of the United States is covered in less detail. Very few of the producers there would be classified as wheat farmers and data are not available to show how much of the capital and labor is used on these wheat-producing farms. But these areas taken together produce almost a fourth of the wheat in the United States.

Wheat production in the three major wheat areas in the western half of the United States can be described as an extensive, highly mechanized type of agriculture.

Areas of production for the major classes of wheat are shown in figure 6. Along the boundaries between two of the areas, there is considerable overlapping in the classes grown. Winter wheat has been pushing farther north as more winter-hardy varieties have been developed. The boundary between hard and soft winter wheat is not a distinct line but rather a belt in which both classes are found.

The hard winter wheat area lies in the southern Great Plains extending from Texas to southern Nebraska and from the Corn Belt to the Rocky Mountains. Subregions 93, 94, and 103 comprise nearly all the hard winter wheat area and the data for these three subregions are used to represent the total for this area. Practically all of the wheat produced in these three subregions is hard winter wheat.

The hard spring wheat area extends from northern Nebraska to the Canadian border and from the Red River Valley in Minnesota to western Montana. It includes subregions 89, 90, 91, and 105. The total for these 4 subregions is used to represent the total for this area. This area produces both winter and spring wheat, although the latter is far more extensive. This territory lies too far north for winter wheat except on the southern border and in protected areas in Montana.

The white wheat area is found in southwestern Washington and northern Oregon, extending slightly into Idaho. The data for this subregion are used as the total for this area. Here both spring and winter wheat are grown, but winter wheat predominates.

Table 4.—NUMBER OF COMMERCIAL FARMS, PERCENTAGE GROWING WHEAT, AND PERCENTAGE CLASSIFIED AS CASH-GRAIN, MAJOR PRODUCING REGIONS: 1954

Item	Number of commercial farms	Percent of commercial farms growing wheat for sale	Cash-grain farms			
			Number	Percent of commercial farms	Percent growing wheat for sale	Average wheat acreage per cash-grain farm
Major wheat regions:						
Hard winter wheat.....	127,971	79.9	75,544	59.0	93.7	168.7
Hard spring wheat.....	104,378	90.8	61,427	58.9	100.0	150.4
White wheat.....	14,551	83.8	9,109	62.6	100.0	244.0
Other regions:						
West of 98 th parallel.....	403,703	23.2	48,524	12.0	72.1	140.8
East of 98 th parallel.....	2,677,286	18.3	343,370	12.8	46.7	27.8

Table 5.—PERCENTAGE OF FARMS REPORTING WHEAT SOLD AND OF THE QUANTITY OF WHEAT SOLD FOR CASH-GRAIN AND OTHER FARMS FOR MAJOR WHEAT REGIONS: 1954

Region and type of farm	Percentage of farms producing wheat for sale	Percentage of total wheat sold in the United States
Major Wheat Regions		
Hard winter wheat:		
Cash-grain farms.....	93.7	21.0
Other commercial farms.....	60.0	4.6
Other farms.....	15.3	0.1
Hard spring wheat:		
Cash-grain farms.....	100.0	13.2
Other commercial farms.....	69.6	2.4
Other farms.....	19.0	(2)
White wheat:		
Cash-grain farms.....	100.0	10.1
Other commercial farms.....	30.9	0.3
Other farms.....	6.7	(2)
Other Regions		
West of the 98 th parallel:		
Cash-grain farms.....	72.1	9.9
Other commercial farms.....	16.6	5.3
Other farms.....	2.4	0.1
East of the 98 th parallel:		
Cash-grain farms.....	46.7	14.9
Other commercial farms.....	14.1	17.3
Other farms.....	2.5	0.6

² 0.05 percent or less.

IMPORTANCE OF MAJOR WHEAT REGIONS

The proportion of the agricultural resources of farmers on commercial farms used by cash-grain farmers in three western wheat-producing regions is shown in table 6. Cash-grain farmers are those who receive at least 50 percent of their income from the sale of grain. Other commercial farmers get more of their income from sources other than grain. Cash-grain farmers in the three major wheat regions have 54 percent of all land and 70 percent of all cropland. They use 62 percent of all capital employed in agriculture, 55 percent of all the farm labor force, and produce 59 percent of all farm products sold in the three major wheat regions.

The adaptation of the wheat plant to a wide range of soil and climatic conditions helps to explain why wheat is grown extensively in the three major wheat regions. In the more productive areas of the Corn Belt, farmers find corn more profitable as a major crop and give it first consideration, even though the yields of wheat in the Corn Belt are higher than the yields in the Great Plains. In the Corn Belt, wheat is grown only because it combines well with other farm enterprises. In earlier years, wheat was grown extensively in the Eastern States and in the Corn Belt, but in recent decades corn and other feed grains have pushed wheat production into areas less favorable for corn production.

Table 6.—PERCENTAGE OF RESOURCES USED AND VALUE OF GROSS SALES FOR ALL COMMERCIAL FARMS REPRESENTED BY CASH-GRAIN FARMS FOR MAJOR WHEAT REGIONS: 1954

Region	All land	Crop-land	Capital investment	Labor force (man-equivalent)	Gross sales
Total, 3 major regions.....	54	70	62	55	59
Hard winter wheat.....	50	67	60	55	53
Hard spring wheat.....	55	68	60	55	62
White wheat.....	72	92	82	62	78

When examined in terms of total units and value, the resources used by the wheat farmers in these specialized wheat-producing

regions loom large. The hard winter wheat region ranks high in number of wheat farms, acres of wheat, wheat production, and total investment. It leads all other regions in total production of wheat. The 146,000 cash-grain farmers in the three regions produced approximately 45 percent of all wheat raised in the United States in 1954. They used nearly \$9 billion in capital investment and the equivalent of 190,000 men. (See table 7.)

Table 7.—NUMBER OF FARMS AND RESOURCES USED ON CASH-GRAIN FARMS IN THE MAJOR WHEAT REGIONS: 1954

Item	Unit	Hard winter wheat	Hard spring wheat	White wheat	Total, 3 regions
Total farms.....	Number	75,544	61,427	9,109	146,080
Acres of cropland.....	Thousands	30,962	33,493	7,219	71,674
Acres of wheat.....	do.	12,029	10,132	2,586	24,747
Wheat production.....	Thousands of bushels	183,690	121,816	84,065	389,571
Value of wheat sales.....	Millions of dollars	371	231	175	777
Gross sales.....	do.	654	480	238	1,372
Investment in—					
Land and buildings.....	do.	3,768	1,900	1,033	6,701
Livestock.....	do.	208	182	27	417
Machinery.....	do.	696	717	166	1,579
Total.....	do.	4,672	2,799	1,226	8,697
Man-equivalent.....	Number	91,041	82,833	14,755	188,629

A comparison of wheat farmers among regions and with the average of all commercial farmers in the United States is shown on a per-farm basis in table 8.¹ Compared with the United States average, wheat farmers are large operators. They use 2 to 4 times as much land and 1½ to 5 times as much capital as the average farmer in the United States, but need only slightly more than the average of man-labor because of the high degree of mechanization.

Marked differences among regions are found in the acreage and amount of investment in commercial cash-grain farms. The producers of white wheat have the largest farms and the largest investment per farm. The producers of hard winter wheat exceed those in the hard spring wheat area in amount of resources other than land.

Table 8.—NUMBER OF COMMERCIAL FARMS AND SPECIFIED CHARACTERISTICS PER FARM, FOR MAJOR WHEAT REGIONS AND THE UNITED STATES: 1954

Region and type of farm	Number of farms	All land in farms (acres)	Total cropland (acres)	Labor force (man-equivalent)	Total investment (dollars)	Investment in—			Gross sales (dollars)
						Land and buildings (dollars)	Machinery (dollars)	Livestock (dollars)	
All commercial farms.....	3,327,889	310	136	1.5	32,874	25,429	4,291	3,154	7,302
Hard winter wheat region.....	127,971	656	359	1.3	53,904	48,593	8,818	4,046	9,600
Cash-grain farms.....	75,544	558	410	1.2	54,956	50,038	9,210	2,749	8,656
Other commercial farms.....	52,427	797	285	1.5	52,388	46,422	8,252	5,914	10,960
Hard spring wheat region.....	104,378	821	471	1.4	41,426	28,646	11,212	4,749	7,469
Cash-grain farms.....	61,427	771	545	1.3	42,281	30,979	11,619	2,964	7,815
Other commercial farms.....	42,951	892	365	1.6	40,203	25,262	10,632	7,302	6,974
White wheat region.....	14,551	1,034	540	1.6	92,428	85,481	14,307	3,853	20,982
Cash-grain farms.....	9,109	1,188	793	1.6	120,910	99,206	18,244	3,005	26,088
Other commercial farms.....	5,442	776	118	1.6	45,514	32,523	7,718	5,272	12,435

¹ Comparison based on cash-grain farms in major wheat regions. Wheat is the principal cash grain produced on most of these farms.

The wheat regions previously outlined are discussed separately on the following pages. When reference is made to other than the cash-grain farmers in the wheat regions the fact is indicated.

The number of cash-grain farmers and the percentage of total wheat production of each major region are as follows:

Area	Number of cash-grain farmers	Percentage of total U. S. wheat produced in area
Hard winter wheat.....	75, 544	20
Hard spring wheat.....	61, 427	13
White wheat.....	9, 109	9

THE HARD RED WINTER WHEAT REGION

Wheat production is most highly concentrated in subregions 93, 94, and 103 (see fig. 7). A similar area extends into southwestern Nebraska and northeastern Colorado where wheat production is specialized. The relative importance of wheat production in this region is indicated by the following data:

Item	Subregion			Total (3 subregions)
	93	94	103	
Total wheat produced on commercial farms (1,000 bu.).....	39, 260	78, 586	108, 129	225, 975
Percent of U. S. total wheat produced on commercial farms.....	4	9	12	25
Percent of region total wheat produced on cash-grain farms.....	74	84	82	81
Percent of region total wheat produced on other commercial farms.....	26	16	18	19

THE HARD WINTER WHEAT AREA, SUBREGIONS 93, 94, AND 103



FIGURE 7.

AS4-502

Wheat production in this region is largely the result of physical conditions. The soils and temperature are favorable for such production, and the precipitation very definitely limits the alternatives to wheat.

Most of the soils in this region belong to the Chernozem group; these are dark, deep, heavy prairie soils, which are excellent for wheat production. But obviously, there are variations in the soils and amount of rainfall in so large a territory. Not much of the occasional coarse-textured soil is used for wheat except on the fringes of the good wheat land where, stimulated by the high prices of the war periods, farmers have broken grassland not well suited to wheat production.

Some of the most serious problems here have come from extending wheat production to land unsuited for it. Severe wind erosion is not limited to the less favorable areas but occurs most often and is most severe in such areas. If winter wheat makes little growth in the fall the soil surface is exposed and wind erosion is likely to take place. Damage consists of the destruction of the wheat seedling and the loss of the topsoil.

The topography varies from level plains to undulating and rolling land. The slopes are seldom so steep as to make the use of large machinery difficult. The limiting factor is rainfall which varies from 15 to 25 inches annually. About three-fourths of this falls during the growing season.

Because of the limited rainfall and high rate of evaporation, much of the wheat is grown on summer-fallow land. In 1954, the wheat and summer-fallow acreages were:

	Subregion			
	93	94	103	Total
Wheat (1,000 acres).....	1, 418	3, 362	7, 249	12, 029
Summer fallow (1,000 acres).....	609	280	4, 608	5, 497

The extent of summer-fallowing varies considerably in the hard winter wheat region and depends on the annual precipitation. Nearly all of the fallow land is used for wheat. Most of it is found in areas of less than 20 inches of rainfall. In dry periods the practice of summer-fallowing shifts considerably to the east. In years of above-normal precipitation the summer-fallow acreage may be reduced throughout the entire region.

Transportation facilities and markets are generally adequate for these wheat growers. Local elevators are found in practically every town along the railroads. Considerable quantities of grain are transported by truck to the central markets. Farm-to-market roads have been improved but relatively few are hard-surfaced and many are not even graveled. This is not a serious drawback in marketing wheat since it need not be delivered at any set time.

When yields of wheat are high, a very large quantity is harvested within a short period, approximately 2 months. Local areas usually complete their harvest in 10 to 20 days. Railroads frequently are unable to provide sufficient boxcars to ship the grain to the terminal markets as rapidly as harvested. It is usual to store some of the wheat on the ground in the fields until transportation and storage are available. This may seem a wasteful practice but in the western part of the region, where July and August rainfall is very low, it provides a very cheap temporary method and the risk of spoilage is not high. Storage capacity on farms and in local elevators is far from adequate for the quantity of grain, but it has been increasing very rapidly during the last decade. Tall elevators dot the landscape. Semiterminal elevators with capacities in the millions of bushels have been built at some of the larger shipping centers such as Oklahoma City, Okla.; Wichita and Hutchinson, Kans.; and Lincoln, Nebr., in the hard winter wheat territory.

The hard winter wheat production is extending northward. More hardy varieties make this possible. Generally, farmers prefer to grow winter wheat if it is well adapted as it is likely to produce higher yields because of its longer growing season. Seeding wheat in the fall reduces the fieldwork in the spring. Then too, fall seeding provides some cover for the soil through the winter and helps to prevent the soil from blowing.

Hard winter wheat is also expanding into the soft winter wheat region. The Pawnee variety, developed in the early 1940's, is very well adapted to conditions in the western Corn Belt. In some years more than half of the wheat acreage in southern Iowa, northern Missouri, and west-central Illinois, is in Pawnee wheat. In this humid area Pawnee produces an intermediate-type wheat—it is lower in protein and has a weaker gluten than when grown in a drier area. This wheat can be used in blending flour for bread.

In the hard red winter wheat region there is considerable variation in size and organization of farms and production, and in efficiency levels. Analysis of the characteristics of commercial wheat farms by economic class in the three subregions will help to explain some of the more important differences. (In this discussion the term "wheat farms" in this region is used as synonymous with "cash-grain farms.")

SIZE OF BUSINESS

The size of business is important in wheat farming, as it is in all phases of agriculture and in business outside the field of agriculture. A first requirement of high returns in mechanized agriculture is a volume of business large enough for effective use of machinery and labor resources.

The size of business can be measured in several ways. In the 1954 Census, farms were sorted by size on the basis of gross sales, and divided into six economic classes. (See Introduction for description of economic classes.) The size of farm business can also be measured in other ways. For example, by the area of land operated, or the capital invested, or the man-equivalent per farm. These measures of size are given for the three subregions in tables 9, 10, and 11.

Classification of farms by the amount of gross sales was necessarily based on 1-year's data, 1954. In areas of specialized crop production gross sales in any one year are determined largely by the yields and prices of the major crop produced. Obviously, higher or lower wheat yields would have changed the classification of some individual farms. For example, an area may have a high percentage of farms in the low-income groups because yields were abnormally low in 1954, or if yields were much above average, the number of farms in the high-income brackets may be abnormally high. A comparison of yields in 1954 with average yields will give some indication of the effect of the 1954 growing conditions on the 1954 classification of the farms.

Subregion

	93	94	103
1954 wheat yields (bushels per acre).....	20.5	19.7	12.2
5-year average (1949-53) yields.....	17.0	13.8	12.1

Wheat farming in this area is characterized by large acreages per farm, a high capital investment, and a family type of farm. The average cash-grain farmer has a total investment of \$45,000 to \$70,000 in comparison with a national average of \$26,000. Only a little more than the equivalent of one man is employed on the typical wheat farm here.

Substantial variation in size of farms is found in the winter wheat region. Subregions 93 and 94 lie in the eastern part, in

southern Nebraska, and in central Kansas, where production per acre is relatively high. Here the land can be farmed more intensively, compared with the western part, because of the high annual rainfall. Consequently, the farms are smaller in acreage farmed. The larger farms in subregion 103 (western Texas, Oklahoma, Kansas, and eastern Colorado) require a larger investment in land and in machinery than the smaller farms in subregions 93 and 94. The livestock investment is rather uniform in all three subregions. Likewise, the labor required per farm is approximately the same.

Table 9.—SIZE OF CASH-GRAIN FARMS IN SUBREGION 93, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Number of farms.....	19,859	283	3,868	7,768	5,603	1,910	427
Total acres per farm.....	358	1,073	554	362	257	184	132
Crop acres per farm.....	258	801	403	264	180	125	75
Capital investment per farm:							
Land and buildings.....							
dollars.....	33,745	97,567	54,577	34,659	22,356	13,827	10,265
Livestock.....do.....	2,817	7,509	4,385	2,948	2,003	1,257	778
Machinery.....do.....	8,023	15,820	10,665	8,218	6,874	5,143	3,313
Total.....do.....	44,585	120,896	69,627	45,825	31,233	20,227	14,356
Man-equivalent per farm.....	1.2	2.1	1.4	1.2	1.1	0.9	0.8

Table 10.—SIZE OF CASH-GRAIN FARMS IN SUBREGION 94, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Number of farms.....	23,140	413	5,179	8,630	6,294	2,233	391
Total acres per farm.....	362	1,163	580	353	226	166	122
Crop acres per farm.....	264	861	435	260	157	106	67
Capital investment per farm:							
Land and buildings.....							
dollars.....	44,520	147,439	75,019	43,546	25,563	17,291	11,807
Livestock.....do.....	2,283	6,486	3,544	2,290	1,503	1,042	617
Machinery.....do.....	7,949	15,948	10,627	7,956	6,496	5,086	3,606
Total.....do.....	54,752	169,873	89,190	53,792	33,562	23,418	16,120
Man-equivalent per farm.....	1.1	2.1	1.4	1.1	1.0	0.8	0.8

Table 11.—SIZE OF CASH-GRAIN FARMS IN SUBREGION 103, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Number of farms.....	32,545	1,928	8,644	10,692	7,086	3,353	842
Total acres per farm.....	820	2,163	1,076	713	519	445	500
Crop acres per farm.....	607	1,534	810	526	384	331	395
Capital investment per farm:							
Land and buildings.....							
dollars.....	55,367	158,204	77,024	47,592	31,245	24,516	22,145
Livestock.....do.....	3,040	7,933	4,275	2,794	1,805	1,033	665
Machinery.....do.....	10,832	18,943	13,102	10,389	8,669	7,282	6,900
Total.....do.....	69,239	185,080	94,401	60,775	41,719	32,831	29,710
Man-equivalent per farm.....	1.3	2.5	1.5	1.2	1.0	1.0	1.0

Farms in Classes IV, V, and VI have a small amount of land and capital for economic family farm operation. The man-equivalent per farm indicates that many of the smaller farms either are operated by older persons or that the operator performs only part-time farmwork, for the man-equivalent of labor on Classes V and VI averaged less than one. The average Class I farms in subregion 103 required 2.5 man-equivalent as compared with 2 for subregions 93 and 94. In other respects, the labor requirements of the average farm in the various size groups are similar for the three subregions.

The size of farms as measured by gross sales is consistent with size determined by other measures. Size of business declines from Class I farms to Class VI farms regardless of the measure used.

One-half to two-thirds of the cash-grain farms in these subregions were in Economic Classes I, II, and III. Farms in these classes had a volume of sales of \$5,000 or more, each. Only a small percentage of the farms in subregions 93 and 94 were Class I farms. Less than 2 percent of the cash-grain farms in subregions 93 and 94, and about 6 percent of the cash-grain farms in subregion 103, had total sales of \$25,000 or more. Even in subregion 103, however, many of these Class I farms would not be considered as large-scale farms. Labor used on Class I farms in subregion 103 averaged only 2.5 man-equivalent per farm, in 1954.

The larger wheat farms, Class I to Class III, have investments of \$50,000 to \$185,000 each. Differences in size were greatest in terms of capital investment. The number of workers averaged from 1.1 to 2.5 man-equivalent while the acreage of farmland per farm ranged from 350 acres for Class III farms to more than 2,000 acres for the large Class I farms. Class I farms averaged more than 2,000 acres per farm in subregion 103. In the region as a whole, nearly three-fifths of the farms are in Classes II and III. The percentage distribution of farms by economic classes is shown in table 12.

Table 12.—PERCENTAGE DISTRIBUTION OF CASH-GRAIN FARMS AND OF WHEAT PRODUCTION IN THE HARD WINTER WHEAT REGION, BY ECONOMIC CLASS OF FARM: 1954

Item and subregion	Economic class of farm					
	I	II	III	IV	V	VI
	Percent of the total in the subregion					
Number of farms:						
Subregion 93.....	1.4	19.5	39.1	28.2	9.6	2.2
Subregion 94.....	1.8	22.4	37.3	27.2	9.6	1.7
Subregion 103.....	5.9	26.6	32.9	21.8	10.3	2.6
Wheat production:						
Subregion 93.....	6.8	36.0	38.3	15.9	2.7	.3
Subregion 94.....	7.5	41.2	35.3	13.3	2.5	.2
Subregion 103.....	17.3	41.8	28.4	9.7	2.5	.3

CROP AND LIVESTOCK ORGANIZATION

Land use and crops grown.—There are differences among the subregions in organization of the cash-grain farms. Farms in subregions 93 and 94 are more diversified than those in subregion 103. A higher percentage of the cropland is summer-fallowed in the western part than in the eastern part of the region. The northern part of subregion 93 produces more corn than wheat while the reverse is true in the southern part. Much of the corn throughout the area is sold as cash grain. The variations in yield from year to year are so large that farmers hesitate to keep enough

livestock to consume the average crop of feed produced. In the southern part of subregion 103 (Texas, Oklahoma, and Kansas) grain sorghum is the strongest competitor with wheat for the use of cropland. The acreage of grain sorghum has been increasing in the northern part of the subregion since earlier maturing varieties have become available.

The most highly specialized wheat area is found in subregion 94 where 59 percent of the cropland is in wheat. (See tables 13, 14, and 15.) The very low summer-fallow acreage partly accounts for this but this subregion also has a small acreage in other crops. Subregion 93 emphasizes corn as an alternative to wheat because of fairly favorable annual rainfall, although here the corn crop frequently fails. The acreages of grain sorghum are increasing in this subregion. In subregion 103 the acreage of grain sorghum is large as grain sorghum is the best alternative for many of these farmers. The proportion of the farms that is in pastureland is quite uniform.

Table 13.—LAND USE ON CASH-GRAIN FARMS IN SUBREGION 93, BY ECONOMIC CLASS OF FARM: 1954

Item	Percent of farms reporting	Economic class of farm						
		Total	I	II	III	IV	V	VI
Number of farms.....		19,859	283	3,868	7,768	5,603	1,910	427
Acres per farm:								
All land.....	100	358	1,073	554	362	257	184	132
Cropland.....	100	258	801	403	264	180	125	75
Wheat.....	93	71	286	122	71	46	26	13
Corn.....	92	73	201	109	77	53	38	27
Grain sorghum.....	54	21	76	31	21	15	11	6
Land pastured.....	92	92	249	138	91	69	53	52
Summer fallow.....	50	64	122	56	29	18	13	8

Table 14.—LAND USE ON CASH-GRAIN FARMS IN SUBREGION 94, BY ECONOMIC CLASS OF FARM: 1954

Item	Percent of farms reporting	Economic class of farm						
		Total	I	II	III	IV	V	VI
Number of farms.....		23,140	413	5,179	8,630	6,294	2,233	391
Acres per farm:								
All land.....	100	362	1,163	580	353	226	166	122
Cropland.....	100	264	861	435	260	157	106	67
Wheat.....	100	145	497	254	142	80	47	27
Oats.....	55	15	46	22	15	11	7	5
Grain sorghum.....	24	11	51	18	10	7	6	4
Land pastured.....	90	95	295	142	90	66	56	54
Summer fallow.....	28	12	36	21	12	6	5	2

Table 15.—LAND USE ON CASH-GRAIN FARMS IN SUBREGION 103, BY ECONOMIC CLASS OF FARM: 1954

Item	Percent of farms reporting	Economic class of farm						
		Total	I	II	III	IV	V	VI
Number of farms.....		32,545	1,928	8,644	10,692	7,086	3,353	842
Acres per farm:								
All land.....	100	820	2,163	1,076	713	519	445	500
Cropland.....	100	607	1,534	810	526	384	331	395
Wheat.....	(NA)	223	569	317	199	129	94	55
Grain sorghum.....	68	115	394	158	90	66	51	37
Land pastured.....	82	212	639	263	185	132	114	106
Summer fallow.....	71	142	327	186	119	93	96	143

NA Not available.

Within each of the subregions, the land-use pattern tends to be similar for all economic classes, with a few significant differences. The smaller farms (Class V and VI) have a higher proportion of land in permanent pasture. They also have a smaller proportion of the cropland in wheat. The relatively low acreage in wheat on Class VI farms in 1954 in subregion 103 was probably the result of a complete failure of the wheat crop in some localities. Failure of the major crop resulted in many farms being classified as Class VI (less than \$1,200 gross sales). Crop failure also accounts for the larger acreage for Class VI farms than for Class V farms, in subregion 103. Some oats were grown in all parts of the hard winter wheat region but the oat crop was less important in subregions 93 and 103 than in subregion 94.

Livestock.—Average livestock numbers per farm in the winter wheat region are more uniform among the subregions than is the land-use pattern. (See tables 17, 18, and 19.) Livestock is an additional source of income on many wheat farms. The typical livestock organization is to have enough cattle to utilize the native pasture and consume the available roughage. The cattle are mostly beef cattle but a few milk cows are kept to supply milk for the farm family. A small flock of chickens is usual. The average number of hogs and sheep per farm is very low. However, because a small percentage of farms have hogs or sheep, the number of animals per farm reporting is considerably larger than shown by the data in tables 16, 17, and 18.

The pattern of livestock numbers by economic class of farm is similar for all subregions. The large farms have more cattle but about the same number of milk cows per farm. In subregion 93, the large farms have more hogs than the smaller farms, reflecting the higher corn production compared with that in subregions 94 and 103. In general, sheep are found on the larger farms, usually on farms that can carry at least 100 ewes. Many flocks are much larger.

Table 16.—LIVESTOCK ON CASH-GRAIN FARMS IN SUBREGION 93, BY ECONOMIC CLASS OF FARM: 1954

Item	Percent of farms reporting	Economic class of farm						
		Total	I	II	III	IV	V	VI
Number of farms.....		19,859	283	3,868	7,768	5,603	1,910	427
Livestock, number per farm:								
All cattle.....	87	26	71	40	27	19	12	7
Milk cows.....	68	3	2	4	4	3	2	1
Hogs.....	43	10	22	17	10	6	3	2
Sheep.....	3	1	8	3	1	1	(Z)	(Z)
Chickens.....	79	113	102	123	123	111	77	47
Gross sales of livestock and livestock products per farm.....dollars..	x x x	1,725	6,867	3,272	1,736	946	420	156
Investment in livestock per farm.....dollars..	x x x	2,817	7,509	4,385	2,948	2,003	1,257	778

^Z Less than 0.5.

Table 17.—LIVESTOCK ON CASH-GRAIN FARMS IN SUBREGION 94, BY ECONOMIC CLASS OF FARM: 1954

Item	Percent of farms reporting	Economic class of farm						
		Total	I	II	III	IV	V	VI
Number of farms.....		23,140	413	5,179	8,630	6,294	2,233	391
Livestock, number per farm:								
All cattle.....	85	26	77	41	26	17	12	7
Milk cows.....	59	3	5	4	3	3	2	1
Hogs.....	24	3	6	5	3	2	2	1
Sheep.....	10	5	13	10	4	2	2	
Chickens.....	75	90	77	103	100	81	59	48
Gross sales of livestock and livestock products per farm.....dollars..	x x x	1,551	6,470	2,832	1,469	782	404	144
Investment in livestock per farm.....dollars..	x x x	2,282	6,486	3,544	2,290	1,503	1,042	617

Table 18.—LIVESTOCK ON CASH-GRAIN FARMS IN SUBREGION 103, BY ECONOMIC CLASS OF FARM: 1954

Item	Percent of farms reporting	Economic class of farm						
		Total	I	II	III	IV	V	VI
Number of farms.....		32,545	1,928	8,644	10,692	7,086	3,353	842
Livestock, number per farm:								
All cattle.....	75	36	94	59	33	21	12	8
Milk cows.....	52	2	2	3	3	2	1	1
Hogs.....	24	3	5	4	2	2	1	(Z)
Sheep.....	3	3	14	5	2	1	2	(Z)
Chickens.....	63	60	52	66	69	56	39	28
Gross sales of livestock and livestock products per farm.....dollars..	x x x	1,682	6,147	2,579	1,340	714	329	110
Investment in livestock per farm.....dollars..	x x x	3,040	7,933	4,275	2,794	1,805	1,033	665

^Z Less than 0.5.

Obviously, some of the operators of the smaller farms have not increased their volume of business by producing more livestock. Probably the lack of capital and the uncertainty of feed production are major reasons. Some of the farmers have intensive livestock enterprises. A few farmers are able to take advantage of the limited outlets for fluid milk and high-quality eggs in the area.

Pasturing wheat is a common practice in the hard red winter wheat region. The wheat, seeded early in the fall, frequently makes rapid growth especially on summer-fallow land. Moderate pasturing is not harmful and some growers feel it increases the yields in years of very rank growth. Grazing is done in both the fall and spring; in years of little snowfall it may continue through the winter. Some wheat growers buy feeders for grazing, others take in feeders for grazing on a rental or contract basis. The cattle and lambs make good gains on the lush growth of wheat when weather conditions are favorable and many are brought in for the purpose. Most of these feeder cattle and sheep were not included in the Census data because they usually are brought in after October 15, the approximate date of the 1954 Census.

LABOR USED

In spite of their relatively large size when measured in acres, gross sales, or capital investment, the wheat farms in the winter wheat regions are typically family farms. On many, the family provides nearly all of the labor; only the very largest hire a large amount of labor.

For the purpose of showing the amounts of labor used on cash-grain farms, all labor was converted to an average man-equivalent basis. This was done in order that more meaningful comparisons might be made between the different sizes of cash-grain farms and between cash-grain farms in different subregions. In the discussion and tables that follow, an adjustment is made for operators over 65 years old and for those who reported they worked at an off-farm job during the year. Operators under 65 years with no off-farm work were considered as one man-equivalent, even though wheat production is a seasonal job. The expenditure for hired labor was divided by an annual average wage for the locality in order to provide man-equivalents for the number of hired workers. The number of unpaid family workers was adjusted to take account of women and children and elderly persons included in the total. The procedure for estimating labor on man-equivalents is explained in detail in the Introduction.

Farm operators comprised slightly less than one man-equivalent per farm in each of the subregions, but made up the bulk of the labor force. (See table 19.) Hired labor was relatively unimportant when cash-grain farms were taken as a group. Sources of labor were quite similar for the three subregions as a whole.

When classified by gross sales, the Class I farmers depended on hired help equaling about as much as the operator's labor. Farmers in the other size groups hired very little help, depending largely on the members of the operator's family. The sources of farm labor and the age of operators for the three subregions, and by economic class for subregion 93, are shown in table 19. Because of the similarity of distribution by economic class of farm among the subregions this detail is not shown for subregions 94 and 103.

Table 19.—LABOR FORCE ON CASH-GRAIN FARMS IN THE HARD RED WINTER WHEAT REGION, AND FOR SUBREGION 93 BY ECONOMIC CLASS OF FARM: 1954

Item	Subregion			Economic class of farm for subregion 93					
	93	94	103	I	II	III	IV	V	VI
Total man-equivalent....	1.2	1.2	1.3	2.1	1.4	1.2	1.1	0.9	0.8
Operator.....	.9	.8	.8	.9	.9	.9	.8	.7	.7
Unpaid family help.....	.2	.2	.3	.3	.3	.2	.2	.2	.1
Hired.....	.1	.1	.2	.9	.2	.1	(Z)	(Z)	(Z)
Operators by age:									
All operators—percent....	100	100	100	100	100	100	100	100	100
Under 25 years do.....	3	2	3	2	1	3	4	4	5
25-34 years do.....	19	16	18	19	22	22	16	13	6
35-64 years do.....	69	70	69	73	74	69	68	63	61
65 years & over do.....	9	12	10	6	3	6	12	20	28

Z Less than 0.05.

Figures on the age of operators show that more of the beginning farmers and more of the farmers over 65 years were in Class VI than in any other income size group in 1954. If this is a typical situation, some of the young men in the lowest income group have been able to improve their situation, for in the 25-to-34-year group, the percentage in Class VI is the smallest.

FARM MECHANIZATION AND HOME CONVENIENCES

The degree of mechanization on the farm and the number of home conveniences reflect the financial situation of the farm family and the progressiveness of the farm operator. In a few localities it is impossible to obtain such modern conveniences as television or electricity, although electric lines are now available to most farmers in the wheat country.

The degree of mechanization and use of home conveniences are indicated in table 20. Class I and II farms are more highly mechanized than the smaller groups of lower income. As their operators have a large acreage, they can use modern machinery efficiently. They also have enough income to allow the purchase of modern equipment which most Class I and II farmers now have. Many of the operators of smaller farms have neither the capital to buy modern machinery nor the acreage to use it efficiently. It is characteristic that many of the operators of Class V and VI farms hire the use of highly specialized, expensive machinery. For example, the number of farms reporting combines varies considerably by size of farm in the three subregions:

Item	Economic class of farm					
	I	II	III	IV	V	VI
Percent of farmers reporting combines:						
Subregion 93.....	91	85	76	64	45	25
Subregion 94.....	89	86	80	65	48	33
Subregion 103.....	80	84	79	67	55	47
Number of combines per farm:						
Subregion 93.....	1.2	.9	.8	.7	.5	.2
Subregion 94.....	1.4	1.0	.8	.7	.5	.3
Subregion 103.....	1.4	1.1	.9	.8	.6	.6

Table 20.—FARM MECHANIZATION AND HOME CONVENIENCES ON CASH-GRAIN FARMS IN THE HARD RED WINTER WHEAT REGION, AND FOR SUBREGION 94 BY ECONOMIC CLASS OF FARM: 1954

Item	Subregion			Economic class of farm for subregion 94					
	93	94	103	I	II	III	IV	V	VI
Number of farms.....	19,859	23,140	32,545	413	5,179	8,630	6,294	2,233	391
Number per farm:									
Automobiles.....	1.2	1.1	1.2	1.6	1.2	1.1	1.0	1.0	0.8
Mototrucks.....	.8	1.2	1.5	2.3	1.6	1.2	.9	.7	.5
Tractors.....	1.6	1.7	1.9	3.3	2.3	1.7	1.4	1.2	.9
Combines.....	.7	.8	.9	1.4	1.0	.8	.7	.5	.3
Percent of farms reporting—									
Automobiles.....	93	92	91	97	97	93	88	85	73
Mototrucks.....	69	86	91	99	98	92	79	64	44
Tractors.....	95	96	95	100	99	98	95	91	76
Combines.....	71	74	75	89	86	80	65	48	33
Corn pickers.....	64	5	3	6	6	6	4	3	1
Field forage harvesters.....	7	10	10	28	19	9	4	2	1
Telephones.....	73	81	64	91	89	82	79	66	54
Electricity.....	93	95	89	99	98	96	91	90	74
Television sets.....	30	45	23	66	61	45	36	33	17
Piped water in home.....	57	71	74	90	87	75	61	53	37
Home freezer.....	30	33	42	62	49	33	25	20	12

In subregions 93 and 94 the number of combines decreases with the size of farm. In subregion 103 the same general relationship is found, although a higher percentage of operators for Class II farms owned combines than for Class I farms, and Class III farmers averaged more combines per farm than the Class I farmers. In this area a number of the large farm operators depend entirely on custom combining. Notwithstanding their large acreages some believe that they can hire the work done more economically than they can do it with their own equipment. This hiring helps to solve their labor problem at harvest time for usually the custom operator furnishes operators for the machines.

Most farmers own at least one automobile. The exceptions are usually farmers who use their trucks for family transportation. Not all farmers in any economic class own tractors as a few depend on having all of their work performed on a custom basis. Custom work is more common among those in the lowest income group than among those in the higher income groups. Cornpickers are more common in subregion 93 because much more corn is produced here than in the other subregions.

Differences in farm income are reflected more in the conveniences in the home than in the degree of farm mechanization. Farm families on the lowest income farms usually do not have enough capital to buy such items as home freezers, television sets, and a water system for the house.

GROSS FARM INCOME

Average gross income per farm was considerably higher in subregion 103, in 1954, where the farms are larger than in subregions 93 and 94.

The important sources of income vary among the three subregions. Subregion 94 specializes in wheat to a higher degree than the other areas as indicated in the following data:

Item	Economic class of farm					
	I	II	III	IV	V	VI
Percent of gross sales from wheat:						
Subregion 93.....	44	39	40	41	37	41
Subregion 94.....	74	75	75	74	73	74
Subregion 103.....	38	57	63	61	61	55

In subregion 93 farmers had considerable income from corn but the relative importance of wheat as a source of income varied little among the economic classes of farms. (Table 21 gives the sources of farm income in the winter wheat region.) In subregion 103 where grain sorghum is an important source of income, Class I farmers ranked lowest in percentage of gross sales from wheat and received more income from grain sorghum than from wheat. Farmers in the other five economic classes received more than half their income from wheat. Gross sales per crop acre are higher in the eastern part of subregion 103 because of the higher yields. Gross sales per crop acre (see table 21) indicate that the problem of the operators of the smaller farms involves not only the area of land farmed but also the level of production.

Table 21.—SOURCES OF FARM INCOME ON CASH-GRAIN FARMS IN THE HARD RED WINTER WHEAT REGION, AND FOR SUBREGION 94 BY ECONOMIC CLASS OF FARM: 1954

Item	Subregion			Economic class of farm for subregion 94					
	93	94	103	I	II	III	IV	V	VI
Number of farms.....	19,859	23,140	32,545	413	5,179	8,630	6,294	2,233	391
Sales per farm:									
Wheat.....dollars..	2,947	5,818	5,457	24,880	10,808	5,465	2,826	1,422	584
Corn.....do.....	1,913	19	51	69	30	20	8	9	22
Oats.....do.....	88	87	12	409	138	78	57	34	24
Grain sorghum.....do	505	73	2,421	538	131	54	39	36	3
Other crops.....do..	178	236	446	1,207	513	188	90	48	16
All crops.....do..	5,631	6,233	8,387	27,112	11,620	5,805	3,020	1,549	649
Livestock and livestock products dollars.....do.....	1,725	1,551	1,682	6,470	2,832	1,469	782	404	144
Gross sales.....do..	7,356	7,784	10,069	33,582	14,452	7,274	3,802	1,953	793
Percentage of gross sales from wheat.....do..	40	75	54	74	75	75	74	73	74
Gross sales per crop acre dollars.....do.....	28.57	29.51	16.60	39.01	33.23	27.93	24.28	18.43	11.83

FARM EXPENSES

Not all costs of operating farms were included on the 1951 Census Questionnaire, but the Census does provide data for some of the major cost items. These serve to indicate differences in cost of production by areas and by the size of business (see tables 22, 23, and 24).

Table 22.—SPECIFIED FARM EXPENDITURES ON CASH-GRAIN FARMS IN SUBREGION 93, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Average per farm:							
Cropland.....acres..	258	801	403	264	180	125	75
Machine hire.....dollars	223	593	335	227	163	131	63
Gas and oil.....do.....	575	1,664	965	585	412	279	171
Hired labor.....do.....	161	1,523	354	119	69	46	31
Commercial fertilizer.....do	228	1,267	527	206	80	36	25
Feed bought.....do.....	440	1,240	743	449	298	170	76
Total.....do.....	1,627	6,287	2,864	1,586	1,022	662	346
Average per crop acre:							
Machine hire.....dollars..	0.86	0.74	0.83	0.86	0.91	1.05	0.84
Gas and oil.....do.....	2.23	2.08	2.25	2.22	2.29	2.23	2.28
Hired labor.....do.....	.62	1.90	.88	.45	.38	.37	.15
Commercial fertilizer.....do	.88	1.58	1.31	.78	.44	.29	.33
Total.....do.....	4.59	6.30	5.27	4.31	4.02	3.94	3.60

Subregion 103 has the highest specified expenditures per farm because the acreage farmed per operator is larger than in other subregions. However, costs per acre are considerably lower because the land is farmed less intensively in this more arid of the subregions.

Table 23.—SPECIFIED FARM EXPENDITURES ON CASH-GRAIN FARMS IN SUBREGION 94, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Average per farm:							
Cropland.....acres..	264	861	435	260	157	106	67
Machine hire.....dollars	263	996	404	252	167	148	79
Gas and oil.....do.....	525	1,526	827	521	345	226	123
Hired labor.....do.....	241	1,682	489	151	103	55	26
Commercial fertilizer.....do	171	761	339	149	79	49	16
Feed bought.....do.....	580	1,690	948	570	359	256	132
Total.....do.....	1,780	6,655	3,007	1,673	1,053	734	376
Average per crop acre:							
Machine hire.....dollars..	1.00	1.16	0.93	0.97	1.07	1.39	1.17
Gas and oil.....do.....	1.99	1.77	1.90	2.00	2.21	2.13	1.83
Hired labor.....do.....	.91	1.95	1.13	.70	.66	.52	.39
Commercial fertilizer.....do	.65	.88	.78	.57	.51	.46	.24
Total.....do.....	4.55	5.76	4.74	4.24	4.45	4.50	3.63

Table 24.—SPECIFIED FARM EXPENDITURES ON CASH-GRAIN FARMS IN SUBREGION 103, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Average per farm:							
Cropland.....acres..	607	1,534	810	526	384	331	395
Machine hire.....dollars	473	1,867	643	341	246	225	121
Gas and oil.....do.....	913	2,795	1,204	775	542	434	406
Hired labor.....do.....	504	2,905	713	272	176	107	125
Commercial fertilizer.....do	61	427	88	27	13	5	(z)
Feed bought.....do.....	400	972	552	373	246	169	86
Total.....do.....	2,351	8,966	3,200	1,788	1,223	940	738
Average per crop acre:							
Machine hire.....dollars..	0.78	1.22	0.79	0.65	0.64	0.68	0.31
Gas and oil.....do.....	1.51	1.82	1.49	1.47	1.41	1.31	1.03
Hired labor.....do.....	.83	1.89	.88	.52	.46	.32	.32
Commercial fertilizer.....do	.10	.28	.11	.05	.03	.02	(z)
Total.....do.....	3.22	5.21	3.27	2.69	2.54	2.33	1.66

z Less than 50 cents or less than 0.5 cent.

In subregions 93 and 94, the cost per acre for machine hire was about the same for all economic classes of farms. In subregion 103 the smaller farms spent considerably less for this item; even for the smallest farms the average per acre of cropland is less than any other groups. In subregion 103 many of the Class VI farmers own a combine and spend little for machine hire.

The smaller expenditures for gas and oil per crop acre for the smaller farms in subregion 103 may reflect less intensive operation. It is possible that the operators of Class V and VI farms did not summer-till the soil as often as the operators of other classes of farms. Since the Class VI farms were also lowest in machine hire per crop acre, it is not likely that the saving in gas and oil was due to more custom work hired. It may be that the lower fuel consumption per acre reflects less tillage of the soil.

The amount of hired labor decreases with the decrease in acreage farmed. The smallest size groups hired only a little labor. The amount of feed bought is closely related to the number of livestock on the farm.

Use of commercial fertilizer in wheat production is a recent practice in the winter wheat region. Farmers in the eastern part have received a good response in higher yields. In the western part of the area the use of commercial fertilizer is not a common practice. In all three subregions commercial fertilizer is used more commonly on the large farms than on those with low gross sales. The figures for rate of application are not fully significant because the composition of the fertilizer was not known. The rate of application is rather uniform regardless of economic class of the farm. This may indicate that those farmers who use fertilizer are using the recommended quantities. (See table 25.)

Table 25.—USE OF COMMERCIAL FERTILIZER ON CASH-GRAIN FARMS IN THE HARD RED WINTER WHEAT REGION, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Subregion 93							
Percent of farms using fertilizer..	44.0	73.0	65.0	48.0	33.0	20.0	14.0
Tons used per farm.....	2.3	11.7	5.1	2.1	.8	.3	.3
Rate of application, pounds per acre.....	128	108	132	200	122	113	162
Subregion 94							
Percent of farms using fertilizer..	43.0	62.0	56.0	45.0	37.0	28.0	17.0
Tons used per farm.....	2.1	8.6	4.1	1.9	1.0	.7	.2
Rate of application, pounds per acre.....	81	78	79	82	84	99	78
Subregion 103							
Percent of farms using fertilizer..	11.0	31.0	17.0	9.0	6.0	3.0	1.0
Tons used per farm.....	.7	4.7	1.0	.3	.2	.1	(^z)
Rate of application, pounds per acre.....	103	125	94	87	106	68	22

^z Less than 0.05 ton.

EFFICIENCY LEVELS OF FARM OPERATION

Efficiency in the use of resources is an important consideration in any business. It is important to the individual farm operator because efficiency is reflected in farm earnings.

Census data do not provide all the information needed to make a complete analysis of the differences among economic classes or among subregions in efficiency of farm operation, but can be used to make comparisons which indicate general levels, even though the specific figures may not always reflect the precise relationships. The comparisons made in tables 26, 27, and 28 indicate wide differences among economic classes of farms in levels of efficiency in the hard red winter wheat region.

Gross sales minus the specified expenditures do not include any fixed costs nor all operating costs. Net income would be much less than indicated by gross sales minus specified expenditures. Obviously, Classes V and VI farms with less than \$2,500 gross sales each, cannot have a high net income.

Measures such as gross sales per man-equivalent and crop acres per man-equivalent, indicate accomplishment per worker. In all subregions gross sales and crop acres per man decline rapidly from Class I to Class VI farms. Less than 150 crop acres per man do not provide full-time employment for a wheat farmer and gross sales of \$1,000 per man cannot provide a high level of living for a farm family.

The total investment per dollar of sales and per-man indicates that the farmers on the smaller farms do not have sufficient capital resources. Sales per dollar of investment on Class II farms are double those on Class V farms. Capital investment per man on Class V farms is about half that on Class II farms. Most of the difference in investment arises from differences in investment in land and buildings. Estimated machinery investment per worker is about the same for the various classes of farms.

The Class VI farmers in subregion 103 have a much higher total investment per man-equivalent and more crop acres per man than the Class VI farmers in the other subregions. In this subregion, it is probable that some large farms had a complete crop failure and abnormally low yields in 1954, and for these reasons fell into a low gross-income group.

Table 26.—SELECTED MEASURES OF INCOME AND EFFICIENCY LEVELS ON CASH-GRAIN FARMS IN SUBREGION 93, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Gross sales per farm.....dollars..	7,356	32,815	14,000	7,261	3,931	2,017	857
Specified expenses per farm.....dollars..	1,642	6,374	2,891	1,601	1,027	667	346
Gross sales less specified expenses per farm.....dollars..	5,714	26,441	11,109	5,660	2,904	1,350	511
Gross sales per man-equivalent.....dollars..	6,229	15,740	9,876	6,051	3,707	2,179	1,054
Total investment per \$100 gross sales.....dollars..	610	369	497	636	801	1,011	1,794
Total investment per man-equivalent.....dollars..	37,083	57,570	49,734	38,187	28,394	22,474	17,945
Machinery investment per man-equivalent.....dollars..	6,799	7,606	7,511	6,848	6,485	5,530	4,090
Machinery investment per crop acre.....dollars..	31	20	26	31	38	41	44
Winter wheat yield per acre.....bushels..	21	24	22	20	18	16	16
Crop acres per man-equivalent.....	218	384	284	220	170	135	92

Table 27.—SELECTED MEASURES OF INCOME AND EFFICIENCY LEVELS ON CASH-GRAIN FARMS IN SUBREGION 94, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Gross sales per farm.....dollars..	7,784	33,583	14,454	7,275	3,802	1,953	793
Specified expenses per farm.....dollars..	1,787	6,665	3,024	1,680	1,056	738	376
Gross sales less specified expenses per farm.....dollars..	5,997	26,918	11,429	5,595	2,747	1,215	417
Gross sales per man-equivalent.....dollars..	7,058	15,997	10,574	6,502	4,084	2,506	985
Total investment per \$100 gross sales.....dollars..	701	506	619	747	883	1,232	2,303
Total investment per man-equivalent.....dollars..	49,775	80,892	63,707	48,902	33,562	29,272	20,150
Machinery investment per man-equivalent.....dollars..	7,208	7,597	7,774	7,111	6,977	6,527	4,476
Machinery investment per crop acre.....dollars..	30	19	24	31	41	48	54
Winter wheat yield per acre.....bushels..	19.7	24.2	20.8	19.1	17.6	15.4	12.6
Crop acres per man-equivalent.....	239	410	318	233	168	140	83

Table 28.—SELECTED MEASURES OF INCOME AND EFFICIENCY LEVELS ON CASH-GRAIN FARMS IN SUBREGION 103, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Gross sales per farm.....dollars..	10,068	42,614	15,219	7,404	3,846	2,044	825
Specified expenses per farm.....dollars..	2,351	8,966	3,201	1,788	1,224	941	739
Gross sales less specified expenses per farm.....dollars..	7,717	33,648	12,018	5,616	2,622	1,103	86
Gross sales per man-equivalent.....dollars..	7,789	16,846	10,130	6,013	3,704	2,384	857
Total investment per \$100 gross sales.....dollars..	692	434	621	821	1,098	1,642	3,714
Total investment per man-equivalent.....dollars..	53,261	74,032	62,933	50,646	41,719	32,831	29,710
Machinery investment per man-equivalent.....dollars..	8,379	7,489	8,721	8,436	8,348	8,495	7,163
Machinery investment per crop acre.....dollars..	18	12	16	20	23	22	17
Winter wheat yield per acre.....bushels..	12	14	13	12	9	7	5
Crop acres per man-equivalent.....	469	606	539	427	370	386	410

OTHER TYPES OF FARMING IN THE HARD RED WINTER WHEAT REGION

Rarely do all the farmers of an area follow the same line of production. Differences in production conditions, available resources, and personal preferences lead to diversity of production within an area. Throughout the wheat regions are farms that have been classified as other types because cash grain did not provide the major source of income in 1954. Only the most common types of farming other than cash-grain will be described. A little more than one-fifth of the wheat produced in the hard red winter wheat region is grown on these other types of farms.

General farms are those which diversify their production to the extent that no one enterprise provides one-half of the gross income. General farms usually produce the same commodities as the more specialized farms in the same area but they are less dependent on a single farm product. The difference in farm organization is more in emphasis on particular enterprises than in types of enterprises. Although cash grain is an important source of income for these general farms, it did not furnish one-half of gross sales in 1954.

In the northern part of the hard winter wheat region general farming is common. Here, general farms are organized much like the cash-grain farms in subregion 93 but more emphasis is given to feed grain and livestock production.

Also, in this subregion are more than 25,000 livestock farms that emphasize production of livestock other than dairy or poultry. Here again, the land-use pattern is much like that of the cash-grain farms with less emphasis on wheat and usually a larger acreage of pasture. In subregions 93 and 94 the livestock farms are similar to those of the Corn Belt. Here, the emphasis is on roughage-consuming livestock, especially beef cattle. A few farmers fatten cattle, some feed out only the cattle they raise, and many market their cattle as feeders. Farmers in subregion 93 raise many more hogs than sheep but the opposite is true in subregion 94.

The livestock farms in subregion 103 are much like the smaller livestock ranches described in Chapter VI. These farms have a much larger acreage in pasture than cash-grain farms, and a much larger number of cattle per farm. The cropland is used largely for a rotation of wheat and fallow and forage crops for winter feed.

Grain sorghum represents the other important cash-grain enterprise in the hard red winter wheat region. Its production in the United States is limited largely to this region. Grain-sorghum production is closely associated with winter wheat production, as many farmers grow both crops. Some farmers use the sorghum as another cash crop whereas others feed the grain to livestock.

The acreage of grain sorghum in the United States has fluctuated between 6 and 11 million acres per year. Grain sorghum is a drought-resistant crop and can be harvested with a grain combine which is common equipment in the wheat country. In earlier years, grain sorghum was mainly restricted to feeding on farms where grown, and as a basic ingredient in mixed poultry feeds but gradually it has become more widely accepted as a feed for fattening livestock. Grain sorghum is generally considered to have 90 to 95 percent of the feed value of corn by weight.

The leading States in grain-sorghum production are Texas, Oklahoma, Kansas, Nebraska, Colorado, and New Mexico. (See table 29.) In 1954, in these 6 States, more than 135,000 farmers raised grain sorghum on 10.9 million acres and produced 168 million bushels for sale. Additional quantities were fed on the farms where raised. Few farms would be classed as grain-sorghum farms for usually the crop is grown on farms where wheat is a more important crop. Grain sorghum is well adapted to the conditions in the Great Plains and offers one of the more promising alternatives to individual wheat producers.

Table 29.—ACREAGE AND PRODUCTION OF GRAIN SORGHUM, BY STATES, IN THE MAJOR PRODUCING STATES: 1954

[Data are estimates based on reports for only a sample of farms]

Item	Texas	Oklahoma	Kansas	Nebraska	Colorado	New Mexico
Number of farms in the State	293,152	119,270	120,291	100,733	40,672	20,977
Number of farms producing grain sorghum	55,950	11,867	46,817	16,829	3,411	1,953
Acreage in grain sorghum	5,610,766	606,407	3,551,408	514,706	387,153	274,949
Number reporting by acres harvested:						
Under 25 acres	18,495	6,196	17,962	9,353	872	429
25-49 acres	8,781	2,669	10,777	4,497	601	307
50-99 acres	11,118	1,584	8,689	2,369	799	341
100-299 acres	13,603	1,062	7,043	577	816	610
300-499 acres	2,606	230	1,315	19	194	170
500 acres and over	1,344	126	1,631	14	129	96
Quantity produced						
bushels	132,342,834	6,068,530	49,912,097	13,998,621	3,941,131	4,491,088
Quantity sold	117,546,674	3,667,790	32,375,634	8,947,772	2,724,378	3,539,871

THE HARD RED SPRING WHEAT REGION

This region lies in the northern Great Plains. Its major wheat-producing areas are subregions 89, 90, 91, and 105 (see fig. 8). Although less wheat is produced in this region than in the hard winter wheat region, it is the major source of income to 61,000 farmers and many other farmers here grow some wheat. The importance of wheat production in this region and the percentage of wheat produced on cash-grain farms are indicated in the following data:

Item	Subregion				Total (4 subregions)
	89	90	91	105	
Total wheat produced on commercial farms (1,000 bu.)	21,142	36,325	16,002	73,936	147,405
Percent of U. S. total wheat produced on commercial farms	2	4	2	8	16
Percent of total wheat for subregion produced on cash-grain farms	73	86	60	89	83
Percent of total wheat for subregion produced on farms other than cash-grain farms	27	14	40	11	17

THE HARD SPRING WHEAT AREA SUBREGIONS 89, 90, 91, AND 105

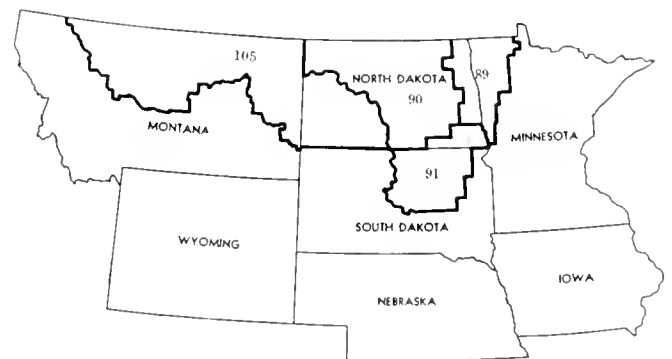


FIGURE 8.

More than four-fifths of the wheat grown in this area is produced on cash-grain farms.

This is largely a spring wheat area because, in most parts, the winters are generally too severe for winter wheat to survive. The severity of the winters is the main distinguishing feature between the hard spring and hard winter wheat area. (In central Montana the Triangle Area in subregion 105, is mainly a winter wheat area. This includes the following counties: Teton, Chouteau, Cascade, Judith Basin, and Fergus. The counties directly north of this group also produce some winter wheat, but the spring wheat acreage predominates. The mountainous topography gives the Triangle Area enough protection to permit winter wheat to succeed.)

The spring wheat area produces both the hard red spring wheat and durum wheat although the former predominates. For the 10-year period, 1941-50, an average of 16 million acres of hard red spring wheat and 2.6 million acres of durum wheat were produced in the United States.² More than 80 percent of all durum wheat was produced in North Dakota, with South Dakota and Minnesota contributing significant quantities.

The soils of the hard spring wheat area are fertile and deep. The Red River Valley soils (subregion 89), are deep, fine-textured, alluvial soils. Most of the soils in subregions 90 and 91 belong to the Northern Chernozem group. These are dark, deep, fine-textured soils, well adapted for wheat. The soils in subregion 105 belong in the Chestnut soil group which are not quite so heavy or so deep as the Chernozem soils but are, nevertheless, good for wheat production. As in the hard winter wheat region, wheat is produced mainly on the silt and silty clay loams that are fairly deep. In the World War periods, under the influences of high prices for wheat, the farmers extended wheat production into areas of coarser textured soils and shallower soils where yields fluctuate greatly. In periods of relatively low prices or in years of unfavorable moisture, farmers in these marginal areas often find their costs exceeding their income.

The topography in the spring wheat region is typical of the Great Plains—fairly level to undulating. The rainfall in the hard spring wheat area is slightly less but evaporation rates are lower than in the hard winter wheat area. Rainfall averages from 10 to 25 inches annually. In subregions 89 and 91 the annual rainfall varies between 20 and 25 inches. Subregion 90 is slightly drier, the average precipitation varying from 15 to 20 inches. The driest part of this region is subregion 105 where the annual precipitation averages from 10 to 20 inches. In all of the hard wheat region, the rainfall and humidity are sufficiently low, especially in the maturing period, to produce a hard kernel. About three-fourths of the rainfall occurs during the growing season; the rainfall is much heavier in the spring and early summer than during the harvest period in late summer.

The low annual rainfall usually necessitates summer-fallowing. Considering evaporation and run-off, 10 to 15 inches of rainfall is not enough to produce satisfactory yields. In many instances, farmers can double the yields by summer-fallowing. But it is not necessary to double the yield to make fallowing profitable. Under this practice wheat harvesting is required only once in 2 years. The fallowing practices serve as seedbed preparation. Operating costs for the 2 years, 1 year of fallow and 1 year of wheat, will exceed the operating costs for 1 year of continuous cropping, but will usually be considerably less than the operating costs for 2 years of continuous wheat. This is important to the wheat farmer in the low-rainfall area. He increases the chance of producing a crop and at the same time reduces the cost of operation.

² Source: Agricultural Statistics - 1953, U. S. D. A.

The wheat and summer-fallow acreages on cash-grain farms by subregions for 1954 were as follows:

	Subregion				Total
	89	90	91	105	
Wheat (1,000 acres)-----	1,063	3,875	964	4,229	10,131
Summer fallow (1,000 acres)-----	645	2,459	206	4,462	7,772

Not all the summer-fallow land is used to grow wheat; some is used for other small grains.

Marketing and transportation facilities are adequate here. As in the hard winter wheat area, mainline railroads and hard-surfaced highways transect the country and farm-to-market roads are adequate for hauling the grain to market. Storage and handling facilities are short of the needs during the peak harvest seasons, but storage space has increased sharply in the period following World War II.

Many characteristics of the wheat farms in the hard spring wheat region are similar to those of the hard winter wheat regions. The farms in this region can be described as large family-type units with a high average investment per farm.

But there are significant differences. A comparison of the hard winter wheat farms with the hard spring wheat farms shows that the spring wheat farms have a slightly lower average total investment due largely to higher land values per acre. A considerably larger proportion of the farms had gross sales of less than \$5,000 in most of the spring wheat subregions.

Farms in the spring wheat region have higher machinery investment, more land, more available labor (see table 31), more tractors, trucks, and combines. The cash-grain farmers in the winter wheat area specialized in wheat, in 1954, to a higher degree than spring wheat farmers with the exception of those in subregion 105. Flax, barley, and corn are among the other important cash and feed grains produced in this region.

Table 30.—A COMPARISON OF THE CASH-GRAIN FARMS IN THE HARD WINTER AND HARD SPRING WHEAT SUBREGIONS: 1954

Item	Hard winter wheat subregions			Hard spring wheat subregions			
	93	94	103	89	90	91	105
Total acres per farm.....	358	362	820	435	696	569	1,304
Crop acres per farm.....	258	264	607	378	535	442	769
Capital investment per farm (dollars):							
Land and buildings.....	33,745	44,520	55,367	31,144	23,926	25,503	45,177
Livestock.....	2,817	2,283	3,040	1,710	2,856	3,513	3,925
Machinery.....	8,023	7,949	10,832	11,748	11,663	10,624	12,220
Total.....	44,585	54,752	69,239	44,602	38,445	39,640	61,324
Man-equivalent per farm	1.2	1.1	1.3	1.4	1.4	1.3	1.3
Percent of gross sales from wheat.....	40	75	54	29	38	31	74

In comparing the subregions within the spring wheat region, and the farmers in subregion by economic class, it is again necessary to consider the influence of yields. The 5-year average yields of wheat were as follows:

5-year average yield (1949-1953) (bushels per acre)-----	Subregion			
	89	90	91	105
1954 yield (bushels per acre)-----	16.5	11.2	9.8	18.0
	14.6	8.0	9.9	15.5

The lower than average yields in 1954 for all but one subregion had some effect on the distribution of farmers by economic class of farm.

SIZE OF BUSINESS

There is a wide range in the size of cash-grain farms among parts of the spring wheat region. (See tables 31, 32, 33, and 34.) In the Red River Valley of North Dakota and Minnesota, the farms average one-third the acreage in the wheat farms in subregion 105 in Montana and are considerably smaller than those in the Dakotas (subregions 90 and 91). When measured by total investment, the Red River Valley farms rank lower than those in subregion 105, but higher than those in subregions 90 and 91. In terms of man-equivalent, the farms in subregion 89 rank highest, because of more intensive farming and greater diversification.

The relationship of the size of farm business in subregion 89 to the economic class is fairly typical of the pattern in other subregions. The smaller farmers as a group are seriously handicapped by lack of resources. It is doubtful that the farm operator can use his time efficiently on the small-size units.

Table 31.—SIZE OF CASH-GRAIN FARMS IN SUBREGION 89, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Number of farms	13,280	363	2,552	4,679	3,540	1,678	468
Total acres per farm	135	1,433	678	431	300	224	167
Crop acres per farm	378	1,324	611	376	247	171	105
Capital investment per farm:							
Land and buildings							
dollars	31,144	111,695	52,429	30,592	19,731	12,965	6,876
Livestock	1,710	3,052	2,563	1,893	1,288	873	383
dollars	11,748	30,101	16,724	11,785	9,377	7,002	4,954
Machinery							
dollars	44,602	144,851	71,716	44,240	30,396	20,840	12,213
Total							
dollars	1.4	3.6	1.7	1.4	1.2	1.0	0.9
Man-equivalent per farm							

Table 32.—SIZE OF CASH-GRAIN FARMS IN SUBREGION 90, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Number of farms	24,389	191	3,151	8,154	8,617	3,358	918
Total acres per farm	696	2,416	1,180	785	560	382	313
Crop acres per farm	535	1,976	944	604	419	284	220
Capital investment per farm:							
Land and buildings							
dollars	23,926	88,320	43,480	26,619	18,384	12,396	10,292
Livestock	2,856	8,404	4,912	3,520	2,251	1,165	618
dollars	11,663	29,115	17,957	12,957	10,430	7,819	6,394
Machinery							
dollars	38,445	126,139	66,349	43,096	31,065	21,350	17,274
Total							
dollars	1.4	3.0	1.8	1.5	1.2	1.0	1.0
Man-equivalent per farm							

Table 33.—SIZE OF CASH-GRAIN FARMS IN SUBREGION 91, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Number of farms	8,687	130	1,372	2,922	2,906	1,086	271
Total acres per farm	569	2,097	930	607	426	293	234
Crop acres per farm	442	1,646	737	469	321	218	185
Capital investment per farm:							
Land and buildings							
dollars	25,503	87,190	44,989	26,995	17,930	11,340	8,915
Livestock	3,513	10,253	6,023	4,067	2,545	1,338	688
dollars	10,624	24,323	15,457	11,197	9,326	6,343	4,474
Machinery							
dollars	39,640	121,766	66,469	42,259	29,801	19,021	14,077
Total							
dollars	1.3	2.6	1.6	1.4	1.2	1.0	1.0
Man-equivalent per farm							

Table 34.—SIZE OF CASH-GRAIN FARMS IN SUBREGION 105, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Number of farms	15,071	1,317	3,609	4,173	3,775	1,709	488
Total acres per farm	1,304	3,281	1,786	1,179	761	524	408
Crop acres per farm	769	2,077	1,051	668	440	291	202
Capital investment per farm:							
Land and buildings							
dollars	45,177	137,276	65,182	35,546	22,253	14,096	11,335
Livestock	3,327	7,281	5,172	4,314	2,675	1,410	871
dollars	12,230	23,472	15,125	11,515	9,476	7,079	5,636
Machinery							
dollars	61,324	168,029	85,479	51,375	34,404	22,585	17,842
Total							
dollars	1.3	2.2	1.5	1.3	1.1	0.9	0.8
Man-equivalent per farm							

The distribution of cash-grain farmers by economic class is shown by subregions in table 35. Also, the percentage of total wheat produced by cash-grain farms in each economic class is shown. The percentage of farmers in Classes IV, V, and VI is considerably higher than in the hard winter wheat region (see table 12). More than half of the farms are in Classes III and IV while more than half the farms are in Classes II and III in the hard winter wheat region. In subregion 105, the percentage of farms in Classes I and II is materially higher than in the other subregions in the hard spring wheat region. The Classes V and VI farms produce a small percentage of the wheat in the subregions because of relatively small wheat acreages and low yields.

Table 35.—PERCENT DISTRIBUTION OF CASH-GRAIN FARMS AND WHEAT PRODUCED, BY ECONOMIC CLASS FOR THE HARD SPRING WHEAT REGION: 1954

Item and subregion	Economic class of farm					
	I	II	III	IV	V	VI
	Percent of total in the subregion					
Number of farms:						
Subregion:						
89	2.7	19.2	35.3	26.7	12.6	3.5
90	.8	12.9	33.4	35.3	13.8	3.8
91	1.5	15.8	33.6	33.5	12.5	3.1
105	8.7	23.9	27.9	25.0	11.3	3.2
Wheat production:						
Subregion:						
89	12.2	36.8	33.4	13.9	3.4	.3
90	4.5	28.3	38.3	22.8	5.3	.8
91	9.2	33.8	33.6	18.8	4.0	.6
105	35.6	35.5	18.0	8.5	2.1	.3

CROP AND LIVESTOCK ORGANIZATION

Land use and crops grown.—Although the Red River Valley and the States of North Dakota, South Dakota, and Montana are generally recognized as comprising the spring wheat region, other crops are grown here. Cash-grain farms in subregions 89, 90, and 91 are diversified. The fact that acreage allotments for wheat were in effect in 1954 may have had a greater effect on land use in this than in the hard winter wheat region. Notwithstanding an increase during the last 5 years in acreage of cropland per farm in each subregion, the acreage of wheat in 1954 in each was less than in 1949.

Crop acres per farm:	Subregion			
	89	90	91	105
1954	378	535	442	769
1949	358	504	425	721
Aeres in wheat per farm:				
1954	80	159	111	281
1949	110	212	150	329

This region is also the leading flax-producing area in the United States. Considerable acreages of barley and oats are produced also. At one time the Red River Valley was well known for its potatoes but the relative importance of this crop has declined. Land use by subregions and economic class of farm is shown in tables 36, 37, 38, and 39.

In subregion 89, wheat was not the major crop in 1954; the acreage in wheat was exceeded by the acreage in barley. Wheat was relatively more important in 1954 in subregions 90, 91, and 105, as these areas have fewer alternative opportunities for land use. Flax and oats or barley were dominant crops in subregions 90 and 91. Some corn was produced, especially in subregion 91. Barley was the main competitor of wheat in subregion 105 but was less important than wheat in the other subregions.

The relative importance of summer-fallowing declines from west to east in the hard spring wheat region. The acreage of pasture per farm and the percentage of the total farm area that is in pasture vary significantly among subregions within the region. The Red River Valley cropland comprises almost the entire farm acreage. In subregions 90 and 91 approximately one-sixth of the land is in pasture and in subregion 105 about two-fifths of the land in cash-grain farms is in permanent pasture.

Farmers in the various economic classes have approximately the same type-of-cropping system. In each subregion there are differences which may have affected gross sales. In subregion 89 the Class VI farms were lower than the Class I farms in proportion of cropland in wheat and barley but much higher in the proportion of cropland in oats. In subregion 90 the Class VI farms were lower than farms in other classes in proportion of cropland in flax and higher in the proportion in oats. Class VI farms in subregion 91 were relatively lower in the percentage of the crop acreage in wheat and much higher in the percentage in oats than Class I farms. In subregion 105 the Class VI farms were relatively lower than other farms in the proportion of cropland in barley. These differences in the relative importance of various small grain crops may explain some differences in gross income.

Table 36.—LAND USE ON CASH-GRAIN FARMS IN SUBREGION 89, BY ECONOMIC CLASS OF FARM: 1954

Item	Percent of farms reporting	Economic class of farm						
		Total	I	II	III	IV	V	VI
Number of farms.....		13,280	363	2,552	4,679	3,540	1,678	468
Acres per farm:								
All land.....	100	435	1,433	678	431	300	224	167
Cropland.....	100	378	1,324	614	376	247	171	105
Wheat.....	(NA)	80	307	136	80	48	32	13
Flax.....	70	46	165	81	43	28	20	10
Barley.....	88	83	328	143	82	51	31	17
Oats.....	71	40	74	52	42	33	26	21
Summer fallow.....	42	32	101	52	32	21	13	6
Land pastured.....	67	33	58	40	33	29	23	24

NA Not available.

Table 37.—LAND USE ON CASH-GRAIN FARMS IN SUBREGION 90, BY ECONOMIC CLASS OF FARM: 1954

Item	Percent of farms reporting	Economic class of farm						
		Total	I	II	III	IV	V	VI
Number of farms.....		24,389	191	3,151	8,154	8,617	3,358	918
Acres per farm:								
All land.....	100	696	2,446	1,180	784	560	382	314
Cropland.....	100	535	1,976	944	604	419	284	220
Wheat.....	(NA)	159	570	275	180	127	83	67
Flax.....	78	70	330	142	81	47	33	16
Barley.....	74	64	276	121	71	49	30	23
Oats.....	71	34	75	49	38	31	20	16
Corn.....	82	11	58	22	14	7	3	1
Summer fallow.....	81	101	433	186	111	76	54	46
Land pastured.....	82	125	359	185	143	108	73	67

NA Not available.

Table 38.—LAND USE ON CASH-GRAIN FARMS IN SUBREGION 91 BY ECONOMIC CLASS OF FARM: 1954

Item	Percent of farms reporting	Economic class of farm						
		Total	I	II	III	IV	V	VI
Number of farms.....		8,687	130	1,372	2,922	2,906	1,086	271
Acres per farm:								
All land.....	100	569	2,097	930	607	426	293	234
Cropland.....	100	442	1,646	757	469	321	218	185
Wheat.....	(NA)	111	572	208	111	74	48	44
Oats.....	91	71	168	100	77	61	44	34
Corn.....	77	55	224	110	60	35	20	14
Flax.....	64	49	160	75	53	37	27	23
Summer fallow.....	40	24	114	44	24	15	11	13
Land pastured.....	82	105	341	150	116	85	60	36

NA Not available.

Table 39.—LAND USE ON CASH-GRAIN FARMS IN SUBREGION 105, BY ECONOMIC CLASS OF FARM: 1954

Item	Total	Economic class of farm					
		I	II	III	IV	V	VI
Number of farms.....	15,071	1,317	3,609	4,173	3,775	1,709	488
Acres per farm:							
All land.....	1,304	3,281	1,785	1,179	761	524	408
Cropland.....	769	2,077	1,054	668	440	291	202
Wheat:							
Winter.....	65	381	101	21	7	3	1
Spring.....	215	366	282	228	155	103	69
Barley.....	65	225	97	45	28	17	13
Summer fallow.....	296	939	443	228	132	86	61
Land pastured.....	512	1,169	696	487	307	221	195

Livestock.—The kinds of livestock kept on farms is fairly uniform throughout the spring wheat region. (See tables 40, 41, 42, and 43.) The number of cattle on individual farms varies with the amount of pasture available. The typical poultry flock is small, kept mainly for production for home use. Average hog and sheep numbers per farm are small because many farmers do not keep them. However, the average number on farms reporting sheep and hogs is much larger than that shown as the average for all farms. This is especially true for sheep. Even milk-cow numbers are larger on many farms that have cows for the production of marketable quantities of dairy products. Many wheat farmers in the more arid parts do not keep cows for family use. The percentage of farmers reporting each class of livestock and the number per farm reporting are shown in tables 40 to 43.

Table 40.—LIVESTOCK ON CASH-GRAIN FARMS IN SUBREGION 89, BY ECONOMIC CLASS OF FARM: 1954

Item	Percent of farms reporting	Economic class of farm						
		Total	I	II	III	IV	V	VI
Number of farms.....		13,280	363	2,552	4,679	3,540	1,678	468
Livestock, number per farm:								
All cattle.....	67	13	24	20	15	11	7	3
Milk cows.....	56	4	3	4	4	3	2	1
Hogs.....	37	6	12	10	7	3	2	1
Sheep.....	9	6	11	11	6	3	4	1
Chickens.....	54	79	68	93	91	77	44	20
Gross sales of livestock and livestock products per farm..... dollars								
Investment in livestock per farm..... dollars	x x x	1,156	2,852	1,964	1,304	718	367	105
	x x x	1,710	3,052	2,563	1,893	1,288	873	383

Table 41.—LIVESTOCK ON CASH-GRAIN FARMS IN SUBREGION 90, BY ECONOMIC CLASS OF FARM: 1954

Item	Percent of farms reporting	Economic class of farm						
		Total	I	II	III	IV	V	VI
Number of farms.....		24,389	191	3,151	8,154	8,617	3,358	918
Livestock, number per farm:								
All cattle.....	74	25	74	43	31	20	10	5
Milk cows.....	64	5	3	6	6	5	3	1
Hogs.....	41	5	15	9	6	4	1	1
Sheep.....	9	7	32	15	8	4	1	1
Chickens.....	62	54	47	66	64	53	35	18
Gross sales of livestock and livestock products per farm.....dollars	x x x	1,215	4,434	2,381	1,526	869	363	155
Investment in livestock per farm.....dollars	x x x	2,856	8,404	4,912	3,520	2,251	1,165	618

Table 42.—LIVESTOCK ON CASH-GRAIN FARMS IN SUBREGION 91, BY ECONOMIC CLASS OF FARM: 1954

Item	Percent of farms reporting	Economic class of farm						
		Total	I	II	III	IV	V	VI
Number of farms.....		8,687	130	1,372	2,922	2,906	1,086	271
Livestock, number per farm:								
All cattle.....	76	30	78	50	35	22	12	6
Milk cows.....	56	4	2	3	4	4	3	1
Hogs.....	45	14	50	27	16	9	4	1
Sheep.....	16	9	71	18	10	5	1	4
Chickens.....	67	101	94	127	121	94	54	37
Gross sales of livestock and livestock products per farm.....dollars	x x x	1,698	8,591	3,326	1,935	1,001	439	126
Investment in livestock per farm.....dollars	x x x	3,513	10,253	6,023	4,067	2,545	1,338	688

Table 43.—LIVESTOCK ON CASH-GRAIN FARMS IN SUBREGION 105, BY ECONOMIC CLASS OF FARM: 1954

Item	Percent of farms reporting	Economic class of farm						
		Total	I	II	III	IV	V	VI
Number of farms.....		15,071	1,317	3,609	4,173	3,775	1,709	488
Livestock, number per farm:								
All cattle.....	68	36	68	48	40	24	13	8
Milk cows.....	51	2	1	2	3	3	2	1
Hogs.....	32	4	5	4	5	4	2	1
Sheep.....	5	5	15	8	4	2	(z)	(z)
Chickens.....	65	46	48	47	55	47	23	21
Gross sales of livestock and livestock products per farm.....dollars	x x x	1,329	2,749	1,840	1,458	805	341	131
Investment in livestock per farm.....dollars	x x x	3,196	7,260	5,171	4,316	2,665	1,407	697

z Less than 0.5.

It is significant that in each subregion the number of milk cows and chickens per farm is highest in the middle economic groups, Classes II to IV. It is probable that some of the operators of these farms keep milk cows and chickens to provide some food for the family and to help reduce cash expenses for family living. Products not needed by the family are sold. Class I farmers probably feel less need for limiting cash expenditures for family living; but Class V and VI farmers who may have the greatest need for additional income and for limiting living costs, also have

fewer milk cows and chickens. The large percentage of farmers in the youngest and oldest age groups may explain partly the small number of cows and chickens on the small farms. The beginning operators may be handicapped by a shortage of capital while the operators over 65 years may not wish to be burdened with livestock chores.

LABOR USED

Most of the labor used on cash-grain farms in this region is supplied by the farm families (see table 44). With the exception of the relatively small number of Class I farms, the organization of most farms is planned around the farm family. (Many of the Class I farms would be classified as family farms.) Hired labor constitutes only a small part of the labor force on all except the Class I farms.

Table 44.—LABOR FORCE ON CASH-GRAIN FARMS IN THE HARD SPRING WHEAT REGION, AND FOR SUBREGION 90 BY ECONOMIC CLASS OF FARM: 1954

Item	Subregion				Economic class of farm for subregion 90					
	89	90	91	105	I	II	III	IV	V	VI
Total man-equivalent...	1.4	1.4	1.3	1.3	3.0	1.8	1.5	1.2	1.0	1.0
Operator.....	.9	.9	.8	.8	.9	.9	.9	.8	.8	.8
Unpaid family help.....	.3	.3	.3	.2	.4	.5	.4	.3	.2	.2
Hired.....	.2	.2	.2	.3	1.7	.4	.2	.1	(z)	(z)
Operators by age:										
All operators, percent...	100	100	100	100	100	100	100	100	100	100
Under 25 years, do.....	2	3	4	4	2	2	3	3	5	4
25-34 years, do.....	17	20	24	20	20	19	23	20	15	10
35-64 years, do.....	69	68	62	64	73	74	69	68	61	59
65 years and over, do...	12	9	10	12	5	5	5	9	19	27

z Less than 0.05.

On most farms all the operators' labor is allocated to the farm business as opportunities for off-farm work are very limited. There was considerable difference in the amount of labor hired on Class I farms in the four subregions. The man-equivalent of hired labor for Class I farms was by subregion as follows: subregion 89, 2.3; subregion 90, 1.7; subregion 91, 1.5; and subregion 105, 1.1. Labor requirements per acre are higher in the Red River Valley than in Montana, for Montana farmers use larger machinery than is generally used on more diversified farms. Subregion 89, with the smallest farms when measured in acres of land, had the largest number of workers per farm. The amount of family help used was about the same for subregions 89, 90, and 91, but was smaller for all economic classes in subregion 105. Less diversification and greater seasonality of the work may be the reasons for less unpaid family help per farm in subregion 105.

The percentage of farm operators that are under 35 years of age is low relative to the percentage in other age groups in all subregions and is lower in subregion 89 than in the other subregions. This is true for all economic classes of farms. It indicates that in the coming years either the rate of decrease in number of farms will be abnormally high or that an unusually high percentage of the farms will be operated by older men. The percentage of operators of Class VI farms who are 65 is high especially in subregion 105 where 37 percent of Class VI operators are more than 65 years of age.

FARM MECHANIZATION AND HOME CONVENIENCES

The cash-grain farms in the spring wheat region are highly mechanized. This has been true for several decades. Wheat farmers were one of the first groups to shift to motive power, for the large fields of fairly level land are excellent for the use of large-size modern machinery. The degree of mechanization and use of modern home conveniences is shown by data in table 45.

Table 45.—FARM MECHANIZATION AND HOME CONVENIENCES ON CASH-GRAIN FARMS IN THE HARD SPRING WHEAT REGION, AND FOR SUBREGION 91 BY ECONOMIC CLASS OF FARM: 1954

Item	Subregion				Economic class of farm for subregion 91					
	89	90	91	105	I	II	III	IV	V	VI
Number of farms	13,280	24,389	8,687	15,071	130	1,372	2,922	2,906	1,086	271
Number per farm:										
Automobiles	1.2	1.2	1.2	1.2	2.1	1.4	1.2	1.1	1.0	.7
Motortrucks	1.2	1.1	1.6	1.7	2.4	1.5	1.0	0.8	0.5	.4
Tractors	2.1	1.9	1.9	1.9	3.9	2.7	2.0	1.7	1.2	1.0
Combines	.9	.9	.8	1.0	1.6	1.0	.9	.7	.5	.3
Percent of farms reporting:										
Automobiles	92	91	90	90	97	96	92	91	85	63
Motortrucks	82	85	75	92	94	92	83	73	48	35
Tractors	96	96	95	96	98	98	97	96	84	82
Combines	80	82	72	80	95	88	81	69	46	26
Corn pickers	10	4	36	4	70	60	41	29	15	7
Field forage harvesters	8	9	8	7	28	19	10	4	1	
Telephones	61	43	52	30	68	67	55	50	36	23
Electricity	91	90	89	85	95	96	94	89	76	56
Television sets	28	17	16	10	19	25	18	15	8	7
Piped water in home	49	38	57	51	88	82	65	46	36	32
Home freezer	39	39	35	52	61	55	40	28	16	8

In subregion 105 a relatively high percentage of farmers own trucks and there is a higher than average number of trucks per farm than in the other subregions. Tractor numbers also varied by subregion and by economic class of farm. The percentage of farms in each class reporting tractors was fairly uniform but the number of tractors per farm varied by economic class of farm as shown by the following data:

Subregion	Number of tractors per farm by economic class					
	I	II	III	IV	V	VI
89	4.4	2.8	2.1	1.6	1.4	1.1
90	4.0	2.7	2.0	1.6	1.3	1.1
91	3.9	2.7	2.0	1.7	1.2	1.0
105	3.1	2.3	1.9	1.6	1.2	1.1

The more diversified areas (subregions 89 and 91) had the largest number of tractors per farm. On diversified farms more than one operation requiring power must frequently be performed on the same day, thus the operators of these farms need more power units. Typically the power units on diversified farms are smaller than on farms in subregion 105.

The use of home conveniences is much more related to the economic class of farm than the particular part of the wheat region in which the farm is located. Almost without exception the lower a group of farmers ranks in gross sales, the lower is the percentage of the farmers having modern home conveniences. The small percentage of the lower income groups reporting telephones, electricity, home freezers, and piped water in the home, is a good indicator of the differences in levels of living among farmers in the economic classes. However, it may be expected that telephones and electricity would be less common in the sparsely settled parts of Montana and the western part of the Dakotas than in the Red River Valley. Home conveniences

were more common in the hard winter wheat region than in the hard spring wheat region.

GROSS FARM INCOME

The sources and amount of farm income indicate the farm organization and the relative importance of different enterprises (see table 46). In the Red River Valley where wheat was not the dominant crop, farmers had several important sources of income. In the central part of the Dakotas, wheat was the major source of income but livestock and livestock products were important. In subregion 105, in western North Dakota and Montana, wheat provided three-fourths of the gross sales.

Table 46.—SOURCES OF FARM INCOME ON CASH-GRAIN FARMS IN THE HARD SPRING WHEAT REGION, AND FOR SUBREGION 105 BY ECONOMIC CLASS OF FARM: 1954

Item	Subregion				Economic class of farm for subregion 105					
	89	90	91	105	I	II	III	IV	V	VI
Number of farms	13,280	24,389	8,687	15,071	1,317	3,609	4,173	3,775	1,709	488
Sales per farm:										
Wheat..... dollars	2,262	2,341	2,111	8,251	34,172	12,393	5,261	2,650	1,388	590
Flax.....do.....	1,080	1,165	739	166	108	159	240	162	91	46
Other crops.....do.....	3,260	1,417	2,289	1,395	6,553	2,157	699	342	203	122
All crops.....do.....	6,602	4,923	5,139	9,812	40,833	14,709	6,200	3,154	1,682	758
Livestock and livestock products										
dollars.....	1,156	1,215	1,698	1,329	2,749	1,840	1,458	805	341	131
Gross sales										
dollars.....	7,759	6,138	6,838	11,142	43,587	16,549	7,658	3,958	2,023	889
Percentage of gross sales from wheat.....	29	38	31	74	78	75	69	67	69	66
Gross sales per crop acre										
dollars.....	20.54	11.48	15.46	14.49	20.98	20.70	11.46	8.99	6.96	4.39

Gross sales per crop acre were highest in the more diversified area (subregion 89); here the yields are the highest in the area. The differences in sales per crop acre in the other subregions are the result of differences in crop yields, in 1954. In subregion 105, the Class I farmers (about 10 percent of all cash-grain farmers in the subregion) had gross sales exceeding \$40,000. These were the large wheat farmers.

The percentage of gross sales on cash-grain farms that came from wheat varied by subregions and by economic class as follows:

Subregion	Wheat sales as a percentage of gross sales by economic class					
	I	II	III	IV	V	VI
89	29	30	29	29	26	15
90	12	39	37	37	39	42
91	40	34	30	31	30	33
105	78	75	69	67	69	66

The importance of wheat as a source of income differs little by the economic class in subregion 90, but declines from Class I to Class VI in the other subregions. This was especially true in subregion 91 where Class VI farmers obtain a relatively small income from wheat.

Livestock sales are relatively important for farms in Economic Classes II, III, and IV but are less important for farms in Classes V and VI. The pattern of the source of income by economic class of farm was similar for all subregions in the hard spring wheat region and in the winter wheat region.

FARM EXPENSES

As in other wheat regions machine hire was the highest in the subregions having the largest acreages per farm. (See tables 47, 48, 49, and 50.) Frequently operators of the larger farms own one or two combines but hire additional machines to speed up harvest. In the localities of high hail risk, the harvesting of wheat is completed as rapidly as possible. Some of the larger operators have found that they can hire the combining for less cost than if they operated their own machines.

Expenditures per crop acre for gas and oil may be expected to decline with a decrease in intensity of operation. However, only in subregion 105 is there a correlation between size of farm and the cost of fuel and oil per acre. Here the larger farms had considerably lower costs per crop acre than the smaller farms.

The amount spent per crop acre for hired labor was approximately twice as large in subregion 89 as in the other subregions. The amount spent per acre for hired labor was highest on the largest farms. This is to be expected for the operators of small farms do not have enough work to employ hired help.

Table 47.—SPECIFIED FARM EXPENDITURES ON CASH-GRAIN FARMS IN SUBREGION 89, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Average per farm:							
Cropland..... acres	378	1,324	614	376	247	171	105
Machine hire..... dollars	198	622	287	193	144	128	86
Gas and oil..... do	833	2,781	1,302	844	575	380	236
Hired labor..... do	490	4,608	1,021	347	144	82	14
Commercial fertilizer..... do	273	1,656	537	235	122	62	34
Feed bought..... do	286	698	542	281	186	104	37
Total..... do	2,080	10,365	3,689	1,890	1,171	756	407
Average per crop acre:							
Machine hire..... dollars	0.52	0.47	0.47	0.51	0.58	0.75	0.82
Gas and oil..... do	2.21	2.10	2.12	2.24	2.33	2.22	2.25
Hired labor..... do	1.30	3.48	1.66	.90	.58	.48	.13
Commercial fertilizer..... do	.72	1.25	.87	.62	.50	.36	.32
Total..... do	4.75	7.30	5.12	4.27	3.99	3.81	3.52

Table 48.—SPECIFIED FARM EXPENDITURES ON CASH-GRAIN FARMS IN SUBREGION 90, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Average per farm:							
Machine hire..... dollars	168	578	259	167	150	120	126
Gas and oil..... do	857	2,702	1,425	963	711	473	342
Hired labor..... do	322	3,248	872	322	174	86	81
Commercial fertilizer..... do	48	593	147	47	22	6	5
Feed bought..... do	172	772	314	197	135	79	35
Total..... do	1,567	7,893	3,017	1,696	1,192	764	589
Average per crop acre:							
Machine hire..... dollars	0.31	0.29	0.27	0.28	0.36	0.42	0.57
Gas and oil..... do	1.60	1.37	1.51	1.60	1.70	1.67	1.55
Hired labor..... do	.60	1.64	.92	.53	.42	.30	.37
Commercial fertilizer..... do	.09	.30	.16	.08	.05	.02	.02
Total..... do	2.60	3.60	2.86	2.49	2.53	2.41	2.51

Table 49.—SPECIFIED FARM EXPENDITURES ON CASH-GRAIN FARMS IN SUBREGION 91, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Average per farm:							
Cropland..... acres	442	1,646	757	469	321	218	185
Machine hire..... dollars	244	971	388	250	184	158	97
Gas and oil..... do	812	2,558	1,337	862	640	388	306
Hired labor..... do	293	2,600	735	260	113	80	66
Commercial fertilizer..... do	35	289	86	33	15	4	4
Feed bought..... do	299	1,019	497	353	198	152	50
Total..... do	1,683	7,497	3,043	1,758	1,150	782	523
Average per crop acre:							
Machine hire..... dollars	0.55	0.59	0.51	0.53	0.57	0.72	0.52
Gas and oil..... do	1.83	1.55	1.76	1.83	1.99	1.78	1.65
Hired labor..... do	.66	1.61	.97	.55	.35	.36	.35
Commercial fertilizer..... do	.07	.17	.11	.07	.04	.01	.02
Total..... do	3.11	3.92	3.35	2.98	2.95	2.87	2.54

Table 50.—SPECIFIED FARM EXPENDITURES ON CASH-GRAIN FARMS IN SUBREGION 105, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Average per farm:							
Machine hire..... dollars	386	1,156	472	333	213	194	144
Gas and oil..... do	1,004	2,129	1,298	974	698	459	330
Hired labor..... do	579	2,566	862	373	156	84	48
Commercial fertilizer..... do	43	181	67	27	12	4	1
Feed bought..... do	142	313	195	141	86	54	28
Total..... do	2,154	6,255	2,894	1,848	1,165	795	551
Average per crop acre:							
Machine hire..... do	0.50	0.56	0.45	0.50	0.48	0.67	0.71
Gas and oil..... do	1.31	1.02	1.23	1.46	1.59	1.58	1.63
Hired labor..... do	.75	1.21	.82	.56	.35	.29	.24
Commercial fertilizer..... do	.06	.09	.06	.04	.03	.01	(2)
Total..... do	2.62	2.88	2.56	2.56	2.45	2.55	2.58

² Less than 0.05 cent.

Because of the decline in the importance of expenditures for hired labor, the total cost per crop acre for specified expenses decreases as the size of farm decreases in subregions 89, 90, and 91. However, the total cost per crop acre does not decline with the change in size of farm in subregion 105 where the lower hired labor per acre on the smaller farms is offset by higher costs for gas and oil.

The use of commercial fertilizer is not common except in the Red River Valley where about half the farmers reported its use (see table 51). In the other areas, less than 15 percent of farmers reported the use of fertilizer. The percentage of farmers in the lower-income groups who use fertilizer is very low. Probably many do not have the capital to buy fertilizer and others probably lack information on which to make a decision to adopt a relatively new practice. The higher percentage of older farmers in these groups may be related to the small percentage of farmers reporting the use of fertilizer. The rate of application reported is rather uniform among the economic classes in subregions 89 and 90. The use of commercial fertilizer in the other two subregions is not a common practice.

Table 51.—USE OF COMMERCIAL FERTILIZER ON CASH-GRAIN FARMS IN THE HARD SPRING WHEAT REGION, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Subregion 89							
Percent of farms using fertilizer.....	52	85	70	56	45	33	21
Tons used per farm.....	3.3	19.2	6.4	2.8	1.5	0.8	.4
Rate of application, pounds per acre.....	71	74	70	69	74	79	88
Subregion 90							
Percent of farms using fertilizer.....	14	54	31	16	9	4	3
Tons used per farm.....	0.5	6.7	1.6	0.5	0.2	0.1	0.1
Rate of application, pounds per acre.....	45	44	45	46	44	44	39
Subregion 91							
Percent of farms using fertilizer.....	11	29	22	13	8	(Z)	6
Tons used per farm.....	.4	3.4	1.0	.4	.2	(Z)	0.1
Rate of application, pounds per acre.....	80	112	81	77	72	53	60
Subregion 105							
Percent of farms using fertilizer.....	11	27	18	11	5	3	(Z)
Tons used per farm.....	0.5	2.0	0.8	0.3	0.1	0.1	(Z)
Rate of application, pounds per acre.....	40	36	37	50	54	66	22

Z Less than 0.5 percent or less than 0.05 ton.

EFFICIENCY LEVELS OF FARM OPERATION

Gross sales minus the specified expenses per farm varied greatly from an average of \$4,570 to \$8,989 among four subregions. (See tables 52 to 55.) This measure does not represent net income because only some of the operating expenses have been considered. Other large items of cost to be considered in arriving at a net income include taxes, repairs and depreciation on buildings and machinery, supplies, and livestock purchases. Additional costs of production would include also the value of the operator's and unpaid family labor and interest on the investment. Also these data indicate returns for only 1 year and therefore may reflect abnormal differences in weather conditions in 1954. Although the importance of specific expense items varies somewhat from one part of this area to another, these data do provide useful measures for comparing economic classes of farms and subregions.

Table 52.—SELECTED MEASURES OF INCOME AND EFFICIENCY LEVELS ON CASH-GRAIN FARMS IN SUBREGION 89, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Gross sales per farm..... dollars..	7,759	36,897	14,616	7,400	3,929	2,037	852
Specified expenses per farm..... do..	2,080	10,365	3,689	1,889	1,171	756	407
Gross sales less specified expenses per farm..... do..	5,679	26,532	10,927	5,511	2,758	1,281	445
Gross sales per man-equivalent do.....	5,581	10,370	8,508	5,430	3,245	2,017	932
Total investment per \$100 gross sales..... do.....	579	394	491	598	779	1,042	1,527
Total investment per man-equivalent..... do.....	31,859	40,236	42,186	31,600	25,330	20,840	13,570
Machinery investment per man-equivalent..... do.....	8,450	8,445	9,735	8,647	7,745	7,297	6,018
Machinery investment per crop acre..... do.....	31	23	27	31	38	41	47
Wheat yield per acre..... bushels..	15	17	16	14	13	10	8
Crop acres per man-equivalent.....	272	371	357	276	204	170	115

Table 53.—SELECTED MEASURES OF INCOME AND EFFICIENCY LEVELS ON CASH-GRAIN FARMS IN SUBREGION 90, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Gross sales per farm..... dollars..	6,138	34,976	13,813	7,104	3,908	2,081	989
Specified expenses per farm..... dollars..	1,568	7,893	3,017	1,697	1,193	764	589
Gross sales less specified expenses per farm..... dollars..	4,570	27,083	10,796	5,407	2,715	1,317	400
Gross sales per man-equivalent..... dollars..	4,493	11,478	7,561	4,898	3,129	2,066	1,001
Total investment per \$100 gross sales..... dollars..	630	360	401	607	797	1,017	1,727
Total investment per man-equivalent..... dollars..	27,461	42,046	36,861	28,731	25,888	21,350	17,274
Machinery investment per man-equivalent..... dollars..	8,538	9,653	8,894	8,933	8,351	7,539	6,441
Machinery investment per crop acre..... dollars..	22	15	17	21	25	28	29
Wheat yield per acre..... bushels..	8	13	10	8	7	6	4
Crop acres per man-equivalent.....	392	648	517	416	336	274	223

Table 54.—SELECTED MEASURES OF INCOME AND EFFICIENCY LEVELS ON CASH-GRAIN FARMS IN SUBREGION 91, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Gross sales per farm..... dollars..	6,838	34,966	14,251	7,297	3,953	2,058	964
Specified expenses per farm..... dollars..	1,683	7,498	3,044	1,758	1,151	783	523
Gross sales less specified expenses per farm..... dollars..	5,155	27,468	11,207	5,539	2,802	1,275	441
Gross sales per man-equivalent..... dollars..	5,225	13,609	8,823	5,364	3,261	2,015	989
Total investment per \$100 gross sales..... dollars..	583	349	468	587	764	951	1,564
Total investment per man-equivalent..... dollars..	30,492	46,833	41,543	30,185	24,834	19,021	14,077
Machinery investment per man-equivalent..... dollars..	8,110	9,464	9,541	8,233	6,707	6,219	4,612
Machinery investment per crop acre..... dollars..	24	15	20	24	29	29	24
Wheat yield per acre..... bushels..	10	12	11	10	8	7	5
Crop acres per man-equivalent.....	338	640	469	345	265	213	190

Table 55.—SELECTED MEASURES OF INCOME AND EFFICIENCY LEVELS ON CASH-GRAIN FARMS IN SUBREGION 105, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Gross sales per farm..... dollars..	11,142	43,587	16,549	7,658	3,958	2,023	889
Specified expenses per farm..... dollars..	2,153	6,285	2,895	1,848	1,164	795	549
Gross sales less specified expenses per farm..... dollars..	8,989	37,302	13,654	5,810	2,794	1,228	340
Gross sales per man-equivalent..... dollars..	8,530	19,632	11,212	6,025	3,608	2,192	1,053
Total investment per \$100 gross sales..... dollars..	552	385	518	667	860	1,129	1,982
Total investment per man-equivalent..... dollars..	47,172	76,377	56,986	39,519	31,276	25,094	22,302
Machinery investment per man-equivalent..... dollars..	9,356	10,572	10,247	9,060	8,639	7,671	6,676
Machinery investment per crop acre..... dollars..	16	11	14	17	22	24	28
Wheat yield per acre:							
Winter..... bushels..	27	29	25	22	20	12	5
Spring..... bushels..	12	18	14	10	9	7	6
Crop acres per man-equivalent.....	589	936	714	526	401	315	240

Some of the more meaningful measures of levels of efficiency are not affected significantly by growing conditions in a single year. These include total investment per man, machinery investment per man, machinery investment per crop acre, and crop acres per man.

Farms in subregion 105 had the highest total investment per man, the highest investment in machinery per man, the largest number of crop acres per man, but the lowest investment in machinery per crop acre. These measures of level of efficiency do not vary greatly among the other three subregions, although for farms in subregion 89 the investment per man and crop acres per man are somewhat lower than for farms in the other two subregions.

Comparisons of measures of level of efficiency by economic class indicate a decrease in total investment and crop acres per man from Class I to Class VI farms, whereas, machinery investment per acre increased from the large to small farms. There was some decline in investment in machinery per man from Class I to Class VI farms but the decline was not nearly as sharp as that for total investment per farm or crop acres per man. This explains perhaps one of the more significant reasons for low net income (gross sales less specified expenditures) on these farms as a minimum amount of machinery is required even for a small acreage. A second significant reason for low incomes on the Class VI farms is the low yields per acre in 1954. In all four subregions, the farms with larger gross income had significantly higher yields per acre.

OTHER TYPES OF FARMING IN THE HARD RED SPRING WHEAT REGION

Other types of farming in the hard spring wheat region are of interest. In the Red River Valley (subregion 89), there were 3,601 dairy farms and 3,213 general farms. On these farms, feed crops were emphasized more than wheat and more livestock were kept than on cash-grain farms.

In subregions 90 and 91, there were 8,942 general farms. These were similar to the cash-grain farms in the same area. Wheat was the major crop on tilled land but the general farms had more pastureland and livestock than the cash-grain farms. No doubt some of these general farms would have been classified as cash-grain farms if wheat yields had been normal.

In subregion 105 in southwestern North Dakota and Montana there is much land not suitable for cultivation. Farmers who have a large acreage of grassland keep more cattle or sheep than wheat farmers. In this subregion there were 6,336 livestock farms. Among these are many that are very similar to wheat farms but with enough income from livestock in 1954 to be classified as livestock farms. Among the farm units classified as livestock are many ranches that have the same characteristics as those in the nearby range livestock areas. These units usually are characterized by large acreages in grass and little cropland.

Although flax was once grown more widely, it is now produced mainly in three States—North Dakota, South Dakota, and Minnesota. In 1954, nearly 80,000 farmers reported a total of 5 million acres with a production of 34 million bushels of flax in these three States (see table 56). North Dakota is by far the leading flax-producing State. Acreage allotments for wheat undoubtedly influenced the acreage of flax. As grain sorghum provides a cash-grain alternative to winter wheat in the southern part of the Great Plains, so flax offers alternative opportunities in the northern Great Plains and Minnesota.

Flax production is closely associated with wheat production, for many farmers grow both crops. Most flax is grown by farmers who raise only small quantities. In 1954, 92 percent of the producers harvested less than 1,000 bushels each; 20 percent harvested less than 100 bushels each.

Table 56.—ACREAGE AND PRODUCTION OF FLAX IN THE THREE LEADING PRODUCING STATES: 1954

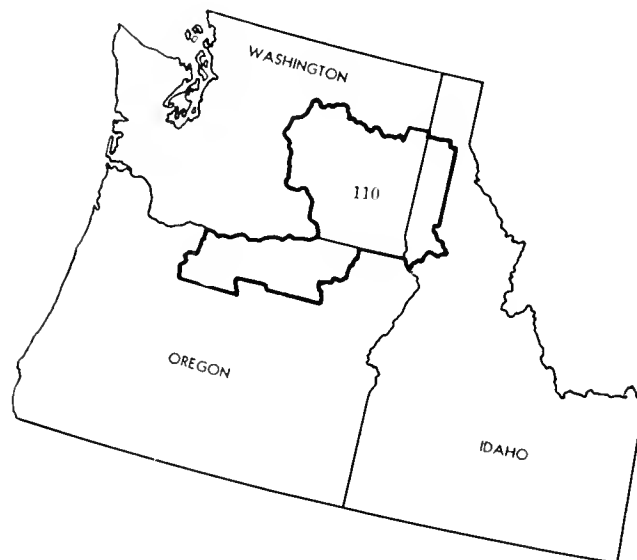
(Data are estimates based on reports for only a sample of farms)

Item	North Dakota	South Dakota	Minnesota
Number of farms in the State	61,808	62,350	165,324
Number of farms producing flax	42,171	16,238	29,491
Acreage in flax	3,126,185	944,306	978,315
Number of farms reporting by acres harvested			
Under 25 acres	8,117	4,444	15,368
25-49 acres	11,166	4,828	8,410
50-99 acres	12,437	4,501	4,362
100 acres and over	10,451	2,465	1,351
Production bushels	20,032,677	5,467,435	8,228,230
Farms reporting by number of bushels harvested			
Under 100 bushels	7,239	3,163	7,317
100-499 bushels	21,155	9,795	17,922
500-999 bushels	8,724	2,443	3,362
1,000 bushels and over	5,053	857	890

THE WHITE WHEAT REGION (SUBREGION 110)

This area, located in northwestern United States (see fig. 9), has long been known for its specialized, large-scale farming. Even before modern tractor power was available, it was known for its large farms and big machines pulled by large teams of horses. It has continued to have large farms and a labor-extensive type of farming. Although some hard winter wheat and some hard spring wheat are grown in the western, more arid part of subregion 110, the soft white wheat predominates. Small quantities of white wheat are also grown in Michigan and New York.

THE WHITE WHEAT AREA SUBREGION 110



A54 525

FIGURE 9.

The soils here include several types—the Northern Chernozem, Northern Dark Brown, and Northern Gray Desert. These are deep silt loams developed from loessal material; they have good moisture-retaining properties and are fertile and well suited to wheat. The topography varies from nearly level valley to hilly land. In much of subregion 110, rolling to hilly land predominates. Many of the slopes are so steep that special machines have been designed to harvest the wheat. One is the self-leveling grain combine. Crawler-type tractors are commonly used for field work.

The variation in precipitation influences the intensity of farming. The rainfall varies from 25 inches annually to less than 10 inches. In the eastern part where the rainfall varies from 18 to 25 inches, the land is cropped each year and wheat is commonly grown in rotation with peas or with other small grains. The line of 18-inch rainfall is the approximate boundary of annual cropping. To the west, in the Big Bend part of Washington and the wheat areas of northern Oregon, where the annual rainfall is 10 to 18 inches, wheat alternates with summer fallow. Summer-fallowing is necessary to accumulate the moisture necessary for a wheat crop. Some fallowing is done in the area of higher rainfall (18 to 25 inches) but here the reason for fallowing is to control weeds or to turn under heavy stubble and give it time to decompose. The driest season occurs during the summer, and provides for ideal harvesting. Transportation and marketing facilities are adequate; both railroads and highways offer ample opportunity for transporting the wheat to market.

The white wheat region ranks below the hard winter and hard spring wheat regions in total wheat production as it is the smallest of the three. In 1954, it produced 87 million bushels of wheat, or 10 percent of all wheat in the United States. Nearly all of the wheat is grown on commercial cash-grain farms. Only 3 percent of the wheat was grown on other than commercial cash-grain farms in 1954.

SIZE OF BUSINESS

This region is characterized by a highly mechanized system of farming. Subregion 110 exceeds any other wheat area in crop acres per farm, gross income per farm, total investment, and investment in machinery. Yields in 1954 were approximately 20 percent above the 5-year average. This affected the gross income and the classification of farms by economic class in 1954, but should not affect appreciably the relationships between economic classes in the acreage per farm or the investment in machinery and land and buildings.

In 1954, more than 70 percent of all cash-grain farms fell into Economic Classes I and II while less than 2 percent were in Class VI. The range in size of farms is exceptionally large; Class I farms are 20 times as large in total acres as Class VI farms. Only the Class I and Class II groups average more than one man-equivalent per farm. Measures of size of farm by economic class are shown in table 57.

Table 57.—SIZE OF CASH GRAIN FARMS IN SUBREGION 110, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Number of farms.....	9,109	3,346	3,303	1,233	775	325	127
Total acres per farm.....	1,188	2,103	874	454	325	213	110
Crop acres per farm.....	793	1,462	566	243	154	100	41
Capital investment per farm:							
Land and buildings, dollars.....	113,412	201,798	83,613	49,576	27,436	18,593	11,747
Livestock, do.....	3,005	4,767	2,476	1,626	1,173	793	569
Machinery, do.....	18,244	25,949	16,213	11,994	9,763	8,176	6,306
Total.....	134,661	232,514	102,304	54,196	38,372	27,562	18,622
Man-equivalent per farm.....	1.6	2.4	1.4	1.1	1.0	0.7	0.7

CROP AND LIVESTOCK ORGANIZATION

Wheat and summer fallow together use nearly three-fourths of the cropland in this area (see table 58). As indicated earlier there are important differences in the use of cropland within the area associated with the amount of precipitation. The farms in the eastern part of Washington and western Idaho receive more rainfall and are more diversified. The production of dry field peas is an important enterprise on many of these farms. Other farmers rotate wheat with feed grains and green manure crops. In the remainder of the subregion, the cropping system is mainly wheat and summer fallow with varying acreages of oats or barley. In the more arid parts a straight wheat-summer fallow rotation is followed.

Table 58.—LAND USE ON CASH GRAIN FARMS IN SUBREGION 110, BY ECONOMIC CLASS OF FARM: 1954

Item	Percent of farms reporting	Economic class of farm						
		Total	I	II	III	IV	V	VI
Number of farms.....		9,109	3,346	3,303	1,233	775	325	127
Acres per farm:								
All land.....	100	1,188	2,103	874	454	325	213	110
Cropland.....	100	793	1,462	566	243	154	100	41
Wheat:								
Winter.....	87	253	496	166	57	30	12	9
Spring.....	30	31	43	31	18	12	10	3
Barley.....	77	87	163	61	27	16	9	3
Peas.....	16	18	34	12	8	3	2	1
Summer fallow.....	84	328	616	235	84	47	17	9
Land pastured.....	71	368	615	286	175	136	71	53

For subregion 110 as a whole, other crops occupy a little over one-fourth of the land. Barley is more important than oats. The acreage of pastureland varies from farm to farm, and consists largely of land not suited for cultivation. The smaller farms have relatively less wheat and fallow and they are located mostly in the diversified area.

The livestock system here is typical of the western wheat areas. Many of the large wheat-fallow farms with little pasture have no livestock. Some farmers keep a small flock of chickens, and enough cattle to utilize the pasture and roughage. Hogs are found on approximately 26 percent of the farms. Sheep are kept on a relatively few farms and the average size of flock for farms keeping sheep is much larger than indicated by data in table 59. The low-income farmers, as a group, have very few livestock, but this group is relatively much smaller in number in the white wheat region than in the other wheat regions. Many of the operators of the low income farms have other occupations or other sources of income.

Table 59.—LIVESTOCK ON CASH GRAIN FARMS IN SUBREGION 110, BY ECONOMIC CLASS OF FARM: 1954

Item	Percent of farms reporting	Economic class of farm						
		Total	I	II	III	IV	V	VI
Number of farms.....		9,109	3,346	3,303	1,233	775	325	127
Livestock, number per farm:								
All cattle.....	72	28	46	23	15	10	7	5
Milk cows.....	52	1	1	1	1	2	1	1
Hogs.....	26	4	5	5	3	3	1	2
Sheep.....	6	4	7	2	3	2		
Chickens.....	64	39	37	42	48	33	27	19
Gross sales of livestock and livestock products per farm..... dollars	x x x	1,449	2,344	1,196	794	447	209	98
Investment in livestock per farm..... dollars	x x x	3,005	4,767	2,476	1,626	1,173	793	569

LABOR USED

For subregion 110 as a whole, the farm operators and their families comprise approximately 60 percent, and hired workers, 40 percent of the total labor force. Unpaid family labor is less important in this subregion than in the other major wheat regions. (See table 60.)

Table 60.—LABOR FORCE ON CASH GRAIN FARMS IN SUBREGION 110, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Total man-equivalent	1.7	2.4	1.3	1.1	0.9	0.7	0.6
Operator	.9	.9	.9	.8	.7	.5	.6
Unpaid family help	.2	.2	.1	.2	.2	.2	(*)
Hired	.6	1.3	.3	.1	(*)	(*)	(*)
Operators by age:							
All operators percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Under 25 years, do	1.0	1.0	1.0	1.0	1.0	3.0	
25-34 years, do	17.0	19.0	18.0	15.0	9.0	12.0	4.0
35-64 years, do	71.0	74.0	73.0	69.0	70.0	61.0	37.0
65 years and over, do	11.0	6.0	8.0	15.0	20.0	24.0	50.0

* Less than 0.05.

The Class I farms average 1,462 crop acres per farm, and have a man-equivalent of 2.1 per farm. Actually several hired men are used during the period when field operations are performed. Many operators of farms in other economic classes have part-time work off the farms; one-third of the operators work more than 100 days off the farm and another 15 percent work 1 to 99 days off the farm. Approximately half of the farmers on the smaller farms perform off-farm work.

A very small percentage of the farm operators are under 25 years of age. Compared with the other wheat regions, the percentage of operators under 25 years old is small and the percentage in the 25-to-34-year group is relatively large. The percentage of operators 65 years of age for Class VI farms is the largest for any region. Many of the operators of these small farms may be semi-retired.

FARM MECHANIZATION AND HOME CONVENIENCES

Farms here are highly mechanized. Nearly all have automobiles, motortrucks, and tractors. Most farmers have only one combine, yet relatively little is spent for machine hire. Many operators of small farms hire their combining performed. (See table 61.)

Table 61.—FARM MECHANIZATION AND HOME CONVENIENCES ON CASH GRAIN FARMS IN SUBREGION 110, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Number of farms	9,109	3,346	3,303	1,233	775	325	127
Number per farm:							
Automobiles	1.4	1.8	1.2	1.0	1.0	1.0	0.7
Motortrucks	2.2	3.3	1.9	1.3	1.1	1.0	.7
Tractors	2.0	2.7	1.9	1.6	1.2	1.2	1.0
Combines	1.1	1.5	1.0	.7	.6	.4	.4
Percent of farms reporting:							
Automobiles	93	98	95	88	81	86	72
Motortrucks	94	99	96	91	88	72	57
Tractors	96	99	97	95	89	89	69
Combines	82	96	84	67	62	42	41
Field forage harvesters	4	5	4	1	2		4
Telephones	82	91	85	74	64	59	56
Electricity	96	98	96	95	93	86	76
Television sets	45	54	46	36	22	24	32
Piped water in home	92	97	94	86	83	75	75
Home freezer	64	80	66	46	38	26	20

Modern home facilities are more prevalent in the white wheat subregion than in the other wheat subregion. This may be related to the small percentage of farmers in the low-income groups; however, this area had power lines in rural areas at an earlier date than most other wheat regions and this fact has probably influenced the proportion of farms with electricity. The Class VI farms rank much higher in percentage of farmers reporting modern home facilities than Class VI farms in other wheat regions.

GROSS FARM INCOME

The average gross income for all cash-grain farms in the white wheat region was the highest for any wheat subregion, in 1954. This would probably be true for most years, for the farms are large and the yields are relatively high. Livestock is a very minor source of income. More than half of the income is derived from wheat even on farms having the lowest gross income (see table 62).

Table 62.—SOURCES OF FARM INCOME ON CASH GRAIN FARMS IN SUBREGION 110, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Number of farms	9,199	3,346	3,303	1,233	775	325	127
Sales per farm:							
Wheat, dollars	19,161	37,986	12,176	4,264	2,028	1,038	411
Other crops, do	5,433	10,174	3,575	1,979	1,250	604	274
All crops, do	24,594	48,160	15,751	6,243	3,278	1,642	685
Livestock and livestock products, do	1,449	2,344	1,196	795	447	209	98
Gross sales, do	26,043	50,504	16,947	7,038	3,725	1,851	783
Percentage of gross sales from wheat	74	75	72	61	54	56	52
Gross sales per crop acre, dollars	32.92	34.58	30.02	29.10	24.33	18.54	20.97

FARM EXPENSES

Specified farm expenditures merely indicate the level of some cost items; total cost of operation would be much higher. The total cost of operation for these large farms is high, but the cost per acre compares favorably with that of most other areas. Machine hire, and gas and oil costs per acre, go up as the size of farm decreases, but hired labor costs per acre decline with the decrease in acreage. Total costs per acre for the specified expenses are approximately the same for all economic classes of farms except Class VI (see table 63).

Table 63.—SPECIFIED FARM EXPENDITURES ON CASH GRAIN FARMS IN SUBREGION 110, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Average per farm:							
Machine hire, dollars	369	451	393	280	171	188	132
Gas and oil, do	1,199	2,039	906	549	398	285	169
Hired labor, do	1,638	3,480	862	206	190	62	66
Commercial fertilizer, do	953	1,878	545	311	221	87	72
Feed bought, do	455	687	393	275	170	181	143
Total, do	4,614	8,535	3,099	1,621	1,150	803	582
Average per crop acre:							
Machine hire, dollars	0.47	0.31	0.69	1.15	1.11	1.87	3.22
Gas and oil, do	1.51	1.39	1.60	2.26	2.59	2.83	4.12
Hired labor, do	2.07	2.38	1.52	.85	1.24	.62	1.61
Commercial fertilizer, do	1.20	1.28	.96	1.28	1.43	.87	1.77
Total, do	5.25	5.36	4.77	5.54	6.37	6.19	10.72

Gas and oil expenditures per acre increase with the decrease in size of farm. In other areas, gas and oil costs per acre do not vary with size of farm. Many of the operators of large farms have undoubtedly invested in tractors that burn low-cost fuel, thus reducing the fuel cost per acre. Machine hire costs per acre also are lower on the large farms than small farms. This is the opposite of this relationship for large and small farms in other areas. For example, in subregions 103 and 105, for Class I farms, expenditures per acre for hired labor were higher on large than on the small farms.

Commercial fertilizer is used more extensively here than in most other wheat subregions (see table 64). Its use was reported on more than 74 percent of the Class I farms in 1954. Of the important wheat-producing regions, only the Red River Valley approaches the white wheat region in percentage of farmers reporting the use of fertilizer.

Table 64.—USE OF COMMERCIAL FERTILIZER ON CASH-GRAIN FARMS IN SUBREGION 110, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Percent of farms using fertilizer.....	64.0	74.0	61.0	59.0	54.0	45.0	28.0
Tons used per farm.....	8.3	15.9	4.9	3.5	2.3	1.3	1.1
Rate of application, pounds per acre.....	96	89	104	152	146	204	326

EFFICIENCY LEVELS OF FARM OPERATION

For the year 1954, the cash-grain farmers of the white wheat region ranked high among cash-grain farmers in all wheat subregions in levels of efficiency. Gross sales per worker of \$16,000 were very high and the investment per \$100 gross sales was low (see table 65). The number of crop acres per man and the investment in machinery per man-equivalent was very high. One man can operate many acres with the large machinery used in the subregion. In 1954, wheat yields were 20 percent above average. A high level of production accompanied by high prices accounts in part for the high gross returns per farm and per worker. For each measure of level of efficiency, there was a decline from Class I through Class VI farms.

Table 65.—SELECTED MEASURES OF INCOME AND EFFICIENCY LEVELS ON CASH-GRAIN FARMS IN SUBREGION 110, BY ECONOMIC CLASS OF FARM: 1954

Item	Economic class of farm						
	Total	I	II	III	IV	V	VI
Gross sales per farm, dollars.....	26,088	50,558	16,994	7,071	3,742	1,862	858
Specified expenses per farm, dollars.....	4,613	8,537	3,098	1,620	1,150	863	581
Gross sales less specified expenses per farm, dollars.....	21,475	42,021	13,896	5,451	2,592	1,059	276
Gross sales per man-equivalent, dollars.....	16,105	21,408	12,518	6,702	3,941	2,512	1,210
Total investment per \$100 gross sales, dollars.....	517	460	605	774	1,037	1,531	2,327
Total investment per man-equivalent, dollars.....	84,163	96,881	73,074	49,269	38,372	39,374	26,603
Machinery investment per man-equivalent, dollars.....	11,263	10,988	11,943	11,367	10,280	11,026	8,899
Machinery investment per crop acre, dollars.....	23	18	29	49	63	82	154
Winter wheat yield per acre..... bushels.....	33	34	31	29	25	28	17
Crop acres per man-equivalent.....	489	619	417	230	162	135	57

RECENT CHANGES BY MAJOR WHEAT REGIONS

Some comparisons between 1954 and 1949 for hard winter, hard spring, and white wheat regions are given in tables 66 to 68. These are not comparisons of an identical group of farms in the two periods as the data for each year are for those farms classified as cash-grain farms in that particular year. The same farms may not have been classified as cash-grain in both years.

From 1949 to 1954, the size of farm increased, the acres in pasture increased, but the acreage in wheat decreased. The magnitude of these changes varied between subregions and between major wheat regions. The most drastic reduction in wheat acreage occurred in subregion 89, where the 1954 acreage was only one-third that of 1949. In several subregions the decrease in wheat acreage was as much as 25 percent.

Table 66.—A COMPARISON OF SOME ITEMS FOR ORGANIZATION, EXPENSES, AND HOME FACILITIES FOR CASH-GRAIN FARMS IN THE HARD WINTER WHEAT REGION: 1954 AND 1949

Item	Subregion 93		Subregion 94		Subregion 103	
	1949	1954	1949	1954	1949	1954
Total farms.....	16,605	19,859	18,002	23,140	34,453	32,454
Acres per farm:						
All land.....	337	358	349	362	812	820
Cropland.....	250	258	263	264	593	607
Wheat.....	84	71	205	145	340	223
Land pastured.....	78	92	78	95	216	212
Livestock—number per farm:						
All cattle.....	15	26	18	26	27	36
Milk cows.....	3	3	3	3	3	2
Hogs.....	9	10	4	3	4	3
Chickens.....	90	113	77	90	61	60
Expenditures per farm (dollars):						
Machine hire.....	197	223	343	263	655	473
Hired labor.....	181	161	298	241	716	504
Gas and oil.....	454	575	493	525	813	913
Total.....	832	959	1,134	1,029	2,184	1,890
Facilities—percent of farms reporting:						
Telephone.....	65	73	71	81	50	64
Electricity.....	74	93	86	95	71	89
Home freezer.....	7	30	11	33	14	42

Table 67.—A COMPARISON OF SOME ITEMS FOR ORGANIZATION, EXPENSES, AND HOME FACILITIES FOR CASH-GRAIN FARMS IN THE HARD SPRING WHEAT REGION: 1954 AND 1949

Item	Subregion 89		Subregion 90		Subregion 91		Subregion 105	
	1949	1954	1949	1954	1949	1954	1949	1954
Total farms.....	13,033	13,280	25,214	24,389	7,054	8,687	12,626	15,071
Acres per farm:								
All land.....	414	435	652	696	526	569	1,147	1,304
Cropland.....	358	378	504	535	425	442	721	769
Wheat.....	110	80	212	159	150	111	329	281
Land pastured.....	34	33	117	125	81	105	406	512
Livestock—number per farm:								
All cattle.....	11	13	18	25	17	30	22	36
Milk cows.....	4	4	5	5	4	4	3	2
Hogs.....	4	6	3	5	9	14	2	4
Chickens.....	58	79	38	54	74	101	35	46
Expenditures per farm (dollars):								
Machine hire.....	190	198	192	168	251	244	219	386
Hired labor.....	580	490	423	322	416	293	574	379
Gas and oil.....	744	833	764	857	606	812	900	1,004
Total.....	1,514	1,521	1,379	1,347	1,333	1,349	1,693	1,969
Facilities—percent of farms reporting:								
Telephone.....	53	61	42	43	45	52	26	30
Electricity.....	81	91	68	90	68	89	67	85
Home freezer.....	17	39	12	39	10	35	19	52

Table 68.—A COMPARISON OF SOME ITEMS FOR ORGANIZATION, EXPENSES, AND HOME FACILITIES FOR CASH-GRAIN FARMS IN THE WHITE WHEAT REGION: 1954 AND 1949

Item	Subregion 110	
	1949	1954
Total farms.....	8,165	9,109
Acreage per farm:		
All land.....	1,147	1,188
Cropland.....	835	793
Wheat.....	384	284
Land pastured.....	340	368
Livestock—number per farm:		
All cattle.....	22	28
Milk cows.....	2	1
Hogs.....	4	4
Chickens.....	39	39
Expenditures per farm (dollars):		
Machine hire.....	312	369
Hired labor.....	1,577	1,638
Gas and oil.....	991	1,199
Total.....	2,880	3,206
Home facilities—percent of farms reporting:		
Telephone.....	76	82
Electricity.....	92	96
Home freezer.....	37	64

The number of cattle increased in all subregions. This was related to the increase in acres pastured, but particularly it was the result of increased cattle production during the period of high cattle prices prior to 1952.

Comparable items of expense for the two Census years are machine hire, hired labor, and gasoline and oil. The total of these expenses per farm is nearly the same for the 2 Census years in several subregions, but there were changes in expenditures for individual items. Machine hire and hired labor decreased in those areas where the wheat acreage declined significantly. However, in subregion 110 both machine hire and hired labor expenses increased from 1949 to 1954.

The proportion of farms with telephones, electricity, and home freezers increased in all eight subregions. Many rural communities in the Great Plains did not have electricity until after World War II, and some electric lines were constructed after 1949. This explains much of the increase in homes having electricity and home freezers. The use of telephones increased slightly during the 5-year period. Undoubtedly the use of these modern conveniences increased as the conveniences became available to farmers and farm families. Moreover, a part of the increase resulted from the relatively good incomes received by farmers in some years.

SOFT RED WINTER WHEAT

In the soft winter wheat area, other enterprises are more important than wheat on most farms. Here, few farms are classified as wheat farms, but the total wheat production is second only to that of the hard winter wheat region. The total soft red winter wheat production in 1954 was approximately 200 million bushels, or one-fifth of the United States total.

The soft red winter wheat belt extends from Missouri to Pennsylvania. It includes most of the wheat-growing area in the eastern half of the United States. The heaviest wheat production in this wide reach of country occurs in the southern part of the Corn Belt, although wheat is grown in nearly all of the States.

The soft winter wheat region receives 35 to 50 inches of rainfall and most of this falls during the growing season. The prevailing high precipitation and humidity produce a soft kernel, relatively low in protein. The winters are seldom so severe as to kill the crop. High summer temperatures usually do not occur until the wheat has matured.

The soils vary greatly, but most of the wheat is grown on deep, fertile soils. The topography varies from level to rolling, with rather steep slopes. Wheat is grown in rather small acreages per farm, in rotation with other crops. The wheat machinery is usually smaller than that used on the Great Plains. The smaller sizes of machines are due more to the smaller acreages of wheat per farm than to limitations imposed by the rolling topography.

Approximately 80 percent of the total soft red winter wheat is produced in the Corn Belt States and Pennsylvania. Though a relatively minor crop, the production of wheat has persisted here for many decades. Farmers have found it profitable to include wheat in their diversified type of farming. The relationships of wheat to other enterprises and to the efficient use of resources are the chief reasons for its continued production in this area.

Cropping conditions vary. Wheat is commonly grown on farms that also produce corn, hay, pasture crops, and frequently some oats, barley, or soybeans. Wheat fits into a rotation with such crops.

Sometimes the wheat is seeded after soybeans have been harvested on the same land or after corn has been cut for ensilage. Wheat may follow oats or barley as these crops mature in ample time for the sowing of winter wheat afterwards. In some cases, wheat is seeded as a companion or nurse crop for grass and legume seedlings as wheat brings in some income while the hay or pasture crop is becoming established. Where wheat follows row crops, only one or two light tillage operations are necessary in making the seedbed as the land has been tilled during the early summer.

Here, wheat contributes to a more efficient use of the farmer's resources. Power units, field machinery, and man-labor can be used for wheat at a time when the other demands for machinery and labor are relatively low. Preparing the seedbed and seeding of winter wheat come between the last corn cultivation and corn harvest. Wheat harvesting may conflict with hay harvesting and with the cultivation of corn and soybeans; but with modern machinery, a small acreage of wheat can be harvested in a very short time. Many farmers have combines for harvesting other small grains and soybeans or they custom-hire their combining so no additional machinery is required for wheat.

Wheat is a desirable crop to many farmers because it brings in some cash at a time when they have few other products to sell and at a time when operating expenses are high. The winter wheat may contribute to the livestock enterprise by furnishing some pasture in the fall and early spring. Some of the wheat is fed, especially to poultry. Wheat straw provides a common source of bedding for livestock.

It is doubtful that wheat is more profitable on an acre basis than other crops, especially corn. It is grown because of its complementary relationship to other enterprises and because of the relatively small increase in cash costs required for its production. The more extensive use of labor and equipment reduces the cost per unit of work. Through its contribution to other enterprises and the increased efficiency in the use of resources, wheat increases the net returns for the entire farm operation. Wheat will undoubtedly continue to be grown in this area more widely known for its corn, soybeans, and livestock feeding.

More than 300,000 farmers grow some wheat in the five major soft red winter wheat States (see table 69). The acreage per farm is small. More than one-fourth of the producers had less than 10 acres in wheat in 1954; and less than 1 percent had 100 acres or more. The fact that wheat is typically a small enterprise is even more clearly illustrated by the number of farmers reporting the quantity of wheat sold. Seventy-six percent of the producers sold less than 1,000 bushels while less than 1 percent sold 3,000 bushels or more.

Table 69.—WHEAT PRODUCTION IN SELECTED STATES IN THE SOFT RED WINTER WHEAT AREA: 1954

[Data are estimates based on reports for only a sample of farms]

Item	Total for selected States	Missouri	Illinois	Indiana	Ohio	Pennsylvania
Number of farms reporting	336,594	50,309	60,137	64,790	99,354	62,004
Acreage (1,000 acres).....	6,342	1,156	1,532	1,289	1,704	661
Average acreage per farm:						
Production (1,000 bushels).....	181,309	32,455	46,241	38,779	45,417	18,417
Yield per acre (bushels).....	29	28	30	30	27	28
Value of crop (1,000 dollars).....	370,519	66,532	96,182	78,334	93,558	35,913
Number of farms reporting by acres harvested:						
Under 10 acres.....	95,928	9,074	7,131	12,923	31,177	35,623
10-24 acres.....	163,241	26,917	30,337	35,278	48,501	22,208
25-49 acres.....	59,112	9,801	16,516	13,243	16,046	3,506
50-99 acres.....	15,803	3,695	5,324	2,974	3,217	593
100-199 acres.....	2,212	698	750	329	380	55
200 acres and over.....	298	124	79	43	33	19
Number of farms reporting bushels sold:						
Under 100 bushels.....	17,506	2,101	1,626	2,066	6,155	5,558
100-499 bushels.....	169,819	25,499	25,042	34,127	54,911	29,340
500-999 bushels.....	68,849	11,045	17,389	16,395	18,637	5,383
1,000-1,499 bushels.....	22,186	3,990	6,940	5,404	4,832	1,020
1,500-1,999 bushels.....	8,001	1,773	2,759	1,864	1,350	255
2,000-2,999 bushels.....	5,179	1,256	2,068	956	746	133
3,000-4,999 bushels.....	1,967	538	784	355	250	40
5,000-9,999 bushels.....	533	167	212	81	53	20
10,000 bushels and over.....	54	22	17	6	7	2

WHEAT PRODUCTION IN OTHER WESTERN REGIONS

The heaviest concentration of wheat production is found in those regions that have been described as the major wheat regions. Much of the remainder of the Great Plains and the Rocky Mountains area has been classed as the range livestock region where livestock provides the major source of income. However, scattered through this vast region are localities in which considerable wheat is grown. In these subregions there were 27,000 cash-grain farmers, in 1954, that produced more than 67 million bushels of wheat. Data regarding these subregions are given below for 1954.

Subregion	Number of cash-grain farms	Acres of wheat	Bushels produced
101.....	7,257	1,117	15,628
104.....	3,332	673	9,056
106.....	6,902	1,217	21,012
109.....	3,969	385	8,816
112.....	5,757	637	13,291
Total.....	27,217	4,029	67,803

In addition to that produced by these wheat farmers, a large quantity of wheat is grown by ranchers who combine stock-raunching with wheat farming. Most of these have been classified as livestock farms because livestock is their most important source of sales.

Wheat is grown in these areas under a variety of production conditions. Much of it is grown in dry-land areas where summer-fallowing is necessary. Some is grown in high mountain valleys and some on irrigated farms, particularly in Idaho and California, in rotation with other crops. The average yield in 1954 was 17 bushels which compares favorably with the yields in the major wheat regions.

SOME PRODUCTION PROBLEMS OF WHEAT FARMERS

Some of the production problems which specialized wheat farmers are facing merit more specific consideration in a review of the wheat industry.

Wheat farms in the major regions are large in comparison with other types of farms. But many wheat growers still face the problem of acquiring control of sufficient resources to make a satisfactory living. Continuous improvement in labor-saving equipment enables each worker to take care of more acres of wheat-land from year to year; therefore, more and more acres of cropland per worker are required if modern machinery is to be used efficiently. There has been a gradual increase in size of wheat farms. This increase is indicated for typical counties in the wheat areas in table 70.

Table 70.—CHANGES IN SIZE OF FARMS IN COUNTIES WHICH ARE TYPICAL OF THE VARIOUS WHEAT REGIONS: 1910-1954

County, State, and subregion	Average size of farm (acres)						
	1910	1920	1930	1940	1945	1950	1954
Polk, Minn.—(subregion 89).....	252	255	247	261	276	302	325
Ward, N. Dak.—(subregion 90).....	326	387	434	454	547	604	650
Brown, S. Dak.—(subregion 91).....	460	442	441	458	503	525	580
Clay, Nebr.—(subregion 93).....	182	196	202	231	256	279	311
Saline, Kans.—(subregion 94).....	229	234	249	248	251	305	374
Kit Carson, Colo.—(subregion 103).....	321	500	594	866	1,148	1,175	1,267
Sheridan, Mont.—(subregion 105).....	(1)	480	600	705	905	1,048	1,092
Lincoln, Wash.—(subregion 110).....	566	715	906	1,038	1,225	1,335	1,447

¹ Not organized until 1913.

The wheat-pea farms of Washington and Idaho serve as an example of the growing problem of acquiring sufficient capital.³ Changes in size of farm, value of real estate, and working capital from 1935 to 1953 were as follows:

Item	1935	1940	1945	1950	1953
Acres per farm.....number.....	389	426	444	482	512
Value of real estate.....dollars.....	22,173	29,057	51,162	89,759	111,616
Working capital.....dollars.....	3,934	6,912	13,379	17,847	23,729
Total investment.....dollars.....	26,107	35,969	64,541	107,606	135,345

A part of the change in dollar investment was due to change in price level. Changes have been somewhat more rapid in this wheat-pea area than in some other wheat areas during the last 20 years, but somewhat similar increases can be noted in other regions.

High capital requirements represent a serious problem to many farmers. This is especially true of a beginning farmer. Even though he starts as a tenant, the large amount of working capital required to operate an efficient unit is difficult to acquire. If the young farmer starts with little capital on a relatively small farm his net income may not be enough to accumulate the capital needed for the essential operation of a more efficient unit. All of his income is likely to be needed to pay family living and operating expenses.

³ Hurd, Edgar B., "Wheat-Pea Farming in Washington and Idaho, 1935-53." Circular No. 954, U. S. D. A., Washington, D. C.

A related problem facing wheat and other farmers is in making the adjustments to the rapid changes in modern technology. Obtaining proper adjustment in mechanization and size of farms is often difficult. As farmers attempt to increase the size of their farm, land becomes difficult to acquire. Thus, many farmers continue to find themselves either operating their land with inefficient equipment or having the modern machinery but being unable to operate efficiently for a lack of sufficient land.

The continual increase in the average size of farms in the wheat areas does not appear to indicate an end to family farms or that the land is rapidly falling into corporate hands. It is an indication that, with modern equipment, the farm family finds it can operate a much larger acreage than was formerly possible. But the decrease in number of families on the land does have economic and social implications for individuals and the community and it means much larger investments in the farm business and fewer families to support local government, local schools, churches, roads, recreational facilities, and community activities. But more prosperous families, though fewer, may mean eventually a more satisfactory community situation than is formed among a larger number of families having very low incomes.

The seasonality of labor requirements is another problem of specialized wheat producers in that most of the work on wheat farms comes during a four to six months period. In many parts of the wheat regions where annual rainfall is 20 inches or less, the opportunities for diversification are limited. Wheat has a decided advantage over other crops and farm operators find their highest returns in specialized wheat production. This does not permit full use of family labor and equipment on a yearly basis. Seasonal labor requirements for a typical wheat farm are as follows:

Monthly Percentage Distribution of Labor Required for Wheat Production¹

Region	January	February	March	April	May	June	July	August	September	October	November	December
Hard winter wheat—Oklahoma					4	15	21	24	24	12		
Spring wheat—North Dakota			15	9	2	2	33	26	10	3		
Soft winter wheat—Illinois	2		2	11	6	6	31	20	26	7	2	1
White wheat—Washington			2	11	6	6	28	15	14	13	5	

¹ Hecht, Reuben W.—Farm Labor Requirements in the United States. 1947—Special report by the Bureau of Agricultural Economics U. S. D. A.

TABLE 71.—ANNUAL PRECIPITATION (INCHES OF RAINFALL) AT REPRESENTATIVE WEATHER STATIONS IN THE GREAT PLAINS WHEAT AREA: 1931-52

Year	Woodward, Okla.	Colby, Kans.	Dalton, Nebr.	Aberdeen, S. Dak.	Dickinson, N. Dak.	Bank, Mont.	Moro, Oreg.
1931	30	16	13	19	16	9	12
1932	29	15	13	20	17	14	11
1933	17	18	18	13	12	9	11
1934	24	9	12	15	8	12	10
1935	21	13	20	24	15	5	7
1936	18	12	11	14	7	12	10
1937	20	15	13	25	16	11	15
1938	30	18	22	17	17	14	11
1939	20	15	10	22	16	8	8
1940	23	16	10	16	17	13	15
1941	46	31	22	21	31	11	13
1942	26	21	25	28	20	13	16
1943	21	14	14	22	15	10	13
1944	33	29	19	28	20	8	8
1945	22	20	23	19	12	12	13
1946	27	28	15	22	14	14	8
1947	24	17	20	21	17	13	14
1948	26	20	13	15	16	16	16
1949	28	27	19	20	11	10	7
1950	31	16	15	18	15	9	16
1951	24	23	22	19	17	17	14
1952	15	14	17	14	12	8	10
Average	25	18	17	20	16	11	12

Source: Climatic Summary of United States—United States Weather Bureau.

Wheat production in the Great Plains area is often regarded as a high risk enterprise. The variability in climatic conditions together with insects and diseases results in considerable variation from year to year in wheat production and farm income.

The climatic hazards facing the farmer in this region are illustrated by the variation in annual rainfall (see table 71). The year-to-year variations may exceed 100 percent. Much of the Great Plains is also a high hail risk area. The hazards of crop failure are particularly serious to the farmer who is in debt and has no financial reserves. Added to this crop uncertainty is the high cash cost of operation.

In contrast to conditions of a few decades ago, farmers now have much higher costs for machinery upkeep; he buys all the fuel he needs for power; he spends much more for insect, disease, and weed control; he faces much higher cash living costs and in some areas, spends more for commercial fertilizer. The following data from the Agricultural Research Service studies⁴ indicates the increase in total cash farm expenditures per farm:

Type of farm	1937-41	1947-49	1954
Wheat, corn, livestock farms, Northern Great Plains	\$1,431	\$1,336	\$4,457
Wheat, small grain, livestock farms, Northern Great Plains	1,614	5,104	5,129
Wheat, roughage, livestock farms, Northern Great Plains	1,306	4,363	1,829
Winter wheat farms, Oklahoma and Kansas	1,839	4,493	4,905
Wheat-pea farms, Washington and Idaho	3,484	7,117	9,159

The lack of alternatives is a major problem to many wheat farmers. In many areas they cannot easily shift to other crops or increase livestock whenever conditions seem unfavorable for wheat. Many wheat producers in the Great Plains, however, do combine wheat and livestock production. Through much of this wheat region there is land that is not suitable for cultivation. It can be utilized only by grazing. Consequently, the farmers may keep sufficient livestock to make use of the feed available. This type of farm organization helps to improve the efficiency in use of labor and equipment.

Many have suggested putting much of the Great Plains wheatland back into grass and using it for livestock production. But farmers who are willing to seed the land back to grass and go into livestock production have important questions to consider. The high investment required for putting land into grass is a deterrent. Establishing grass in the low rainfall areas is difficult, especially since farmers are likely to consider shifts to grass only when conditions are dry and wheat yields are low. Such conditions are not favorable for establishing grass and obtaining a living from livestock. Often the grass seedings fail entirely; or, when the establishment of grass is partially successful, several years are required to produce sufficient feed for livestock production. Under such conditions, the waiting for income from livestock production and the risks involved give rise to important problems to many farmers.

These are some of the production problems wheat farmers face. The fact that in its original state land in the Great Plains was better suited to grazing than to farming does not necessarily provide the answer to the farmer who has such land which has been broken out in a period when wheat was very profitable. And the fact that a man could operate a farm and get ahead financially in the past even though he had little capital to work with, offers little promise to the farmer who is producing wheat in this age of highly mechanized farming.

⁴ Farm Costs and Returns on Commercially Operated Farms—Agriculture Information Bulletin 158. ARS—U. S. D. A.—1956.

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