FAMILY FARMS in a CHANGING ECONOMY

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PREFACE

Changes in numbers and sizes of farms are subject to varied interpretations. This is largely because of differences in concepts and definitions. It stems also from failure of many persons to recognize and understand the changing role of agriculture in a dynamic environment.

The study reported here is an analysis of changes in number and size of farms as related to technological advances in agriculture and growth of the economy generally. An attempt is made to clarify the definitions and concepts that have tended to obscure these relationships and to develop a more meaningful classification of farm size through time. The changing size structure of farming is examined from the standpoint of classifying family farms as they have existed during the quarter-century ending in 1954 in respect to levels of farm output, relative size of farm operations, and levels of real farm income. This report of the study is expected to be useful to those who formulate agricultural policies and programs. For those with a more general interest in American agriculture, it will contribute toward a clear understanding of the process of adjustment by farm people to a constantly changing economic environment.

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FAMILY FARMS IN A CHANGING ECONOMY

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SUMMARY

During the 25-year period, 1930-54, farms have become larger and fewer in number. The total number of census farms has declined by 1.5 million, and there has been an even greater decrease in the number of commercial farms. At the same time, numbers of part-time and residential units have increased rapidly. These part-time and residential farms, which comprised 15 percent of all farms in 1930, accounted for nearly a third of all farms in 1954.

Commercial farms - those from which the farm families derive their major source of income from farming - decreased from 4.7 million in 1930 to 3.1 million in 1954. More than half of this decline took place between 1944 and 1954. Commercial farms comprised 75 percent of all census farms in 1930 and about 65 percent in 1950 and 1954.

The decrease of almost a million in the number of commercial farms in the South was a much more rapid decline than was recorded in other broad regions of the country. This decrease in the South is reflected largely in reductions in the number of cropper units. On the basis of management units rather than census farms, the decrease of a half million for the South is roughly comparable to the decrease shown for other regions of the country.

Noncommercial farms, as defined in this analysis of trends, are comprised of part-time and residential farms and subsistence farms. Part-time and residential farms are those farms with total farm sales of less than $2,500 where the major source of money income or employment is from off-farm sources. Subsistence farms are those on which farm sales of less than $250 are the major source of cash income of the farm family. Part-time and residential farms have increased by nearly 600,000. Subsistence farms, which numbered more than a half million in 1930 and 1940, declined steadily for the next 15 years. In 1954, they numbered less than 200,000.

The increase in part-time farming is associated with growth of the nonfarm sector of the economy and the greater availability of jobs in

local industries, trades, and services. The number of part-time and residential farms as classified in this report reached a numerical peak in 1950. The absolute numbers of these farms declined between 1950 and 1954, but the proportion they comprise of all farms increased slightly because of the reduction in the total number of farms.

Most of the increase in part-time farming has been in the South, where part-time and residential farms nearly doubled between 1930 and 1950. In 1954, these farms comprised two-fifths of all farms. In the rest of the United States, about a fourth of the farms were classified as part-time and residential.

Commercial farms were fewer in number but larger in size in 1954 than they were 25 years earlier. Mechanization of farming operations and other technological improvements in farm production practices have resulted in substantial increases in the size of farms. This is true when farms are measured by either volume of farm sales or acreage handled. The average value of farm sales per commercial farm (valued at 1954 prices) increased from $3,400 in 1930 to $7,500 in 1954. The average acreage per commercial farm rose from 220 to 336 acres during this period.

At the upper end of the size scale, there has been a threefold increase in the number of farms with sales of $25,000 or more (valued at 1954 prices). These larger units in commercial agriculture are not numerous. In 1954, they comprised only 4 percent of the commercial farms but accounted for about 30 percent of the farm marketings.

The number of smaller units in commercial agriculture (those with farm sales of $250 to $2,499, valued at 1954 prices) decreased from nearly 3 million in 1930 to 1 million in 1954. Many of the farms included in this category in earlier years increased their market sales and were grouped in higher sales categories in later years. Others took up part-time farming or left farming entirely.

Commercial farms between these two extremes in size of business (those with farm sales of $2,500 to $25,000, valued at 1954 prices) comprised a higher proportion of commercial farms in 1954 than at any time in the previous 25 years.

Of particular interest in the current setting are changes in the number of commercial family farms. The trend toward larger commercial farms has been viewed with apprehension by many who fear its effect on the family-farm structure. Increases in farm size are taken by some persons to forebode an increase in the use of hired labor in farming and

an associated increase in a farm population without equity in farm ownership or management decisions. This would conflict with long-held social values of the American people, who regard the family farm as one of the bulwarks of a stable and prosperous rural economy.

The study reported here also views growth in farm size in relation to changes in the productive work capacity of the farm family labor force. A major premise is that comparable growth in farm size was to be expected during a period in which improved farming methods nearly doubled the work capacity of farm labor. The question of growth in farm size as it relates to the family farm in this approach is whether this growth in volume of business has been more or less consistent with the extent to which new farming techniques have meant greater control by the farm family over other production resources.

When viewed in this way, family farms appear to be holding their own. The number of operations that are larger than family size has decreased. Although their number decreased, along with the overall decline in commercial farm numbers, family farms and large-scale farms made up about the same proportion of commercial farms in 1954 as they had a quarter of a century earlier. Moreover, there has been no tendency toward increasing concentration of farmland or market sales on the larger units. Farmland and market sales were divided in approximately similar proportions between large-scale and family farms in each of the years for which data were available for making these estimates. Since 1940, there is evidence that operators of family farms have made a slight gain over those of large-scale farms in controlling land resources and market sales. However, this evidence is not conclusive.

Recent trends indicate that the number and importance of family farms have been affected largely by the many adjustment problems that are found on the smaller units in commercial agriculture rather than by the encroachment of large-scale farming. Technological improvements in farm production practices have been associated with increasing disparity between the largest and smallest sizes of farms. The substantial shift of farm families from commercial to part-time farming, and migration of others from agriculture to nonfarm occupations have resulted in no appreciable improvement in the farm organization and income of many small units that remain in commercial agriculture. The proportion that small-scale farms are of all commercial farms has increased over the years. From the standpoint of real incomes from farming, the problem of low-income farms is a chronic one.

Realizing the difficulty of defining the family farm in concrete terms, the author of the study reported here has attempted to separate, so far

as can be determined on the basis of gross farm sales, those farm units that would generally be considered larger than family size. Also separated are those farms on which incomes are very low. It is believed that in each year the remaining numbers of farms may represent the trend in what is frequently referred to as "the adequate family farm" or "the family farm ideal."

It is apparent that the number and proportion of the commercial farms that meet these specifications have varied considerably through time. Scale of operation imposes an upper limit that has held fairly constant over the years. But determination of the number of family farms with medium to high incomes introduces variations concerning the extent to which their numbers depend on external economic factors over which the farm families have little control. Prices for farm products, the relative cost to farmers of items used in farm production and for family living, and the availability of profitable job alternatives outside agriculture have an essential part in determining the number and importance of family farms with medium to high incomes.

THE BACKGROUND

Changes in numbers and sizes of farms in the United States have always been of general interest. This is natural for a Nation whose economic history is tied closely to an agricultural origin. This interest may have been kindled in the earliest settlement on the Atlantic seaboard. It was nurtured in the basic philosophy of an infant government, which visualized widespread private ownership and control of land. This philosophy shaped the settlement of each succeeding land frontier and largely determined the present structure of American agriculture. The pattern of farming that evolved - the predominance of family operations - remains a dominant characteristic of agriculture in this country. What and how much to produce, when to market, and the entire range of production decisions, for the most part, are vested in several million highly competitive farm units. In the modern economic environment, farming remains the stronghold of small enterprises, which function in an almost classically competitive agricultural market.

Much of the current interest in numbers and sizes of farms stems from concern over the ability of this basic structure to withstand the stresses and strains of a changing world. The apparent growth in farm size in recent years and the reduction in farm numbers have caused many persons to wonder whether family farms are giving way to large-scale employer units. "Factories in the field," with their attendant separation of management and labor, and accumulations of land into relatively few large holdings are feared by some persons to be a probable result of the technological revolution that is taking place in agriculture. The increasing investment needed and the larger cash costs that are associated with modern, highly specialized, commercially oriented agriculture have raised questions as to the ability of operators of family farms to compete in the adoption of new techniques intended to raise efficiency and output. The continuing problem of low farm incomes in a substantial segment of agriculture points to the fact that many farm families have not shared in the technological gains that have characterized recent decades. It is in this setting of apprehension over the future of the family farm that attention is focused on changes in the size structure of American agriculture.

Changes in numbers and sizes of farms are subject to varied interpretations. This is largely because of the differences in concepts and definitions. It stems also from the failure of many persons to recognize and understand the changing role of agriculture in a dynamic environment. Certain terms used in descriptions and discussions of farming have different meanings to different people. The definition of a

large or small farm, for example, depends on the perspective in which it is viewed. Similarly, the phrase "family farm" has connotations that may imply one thing to some people and something quite different to others. In addition, these terms are subject to the modifications of time. They have taken on new meanings under the impact of social and technological changes.

Farm size is a relative term. What may be a large farm to a person in the Eastern United States, especially if measured in acres, might well be thought of as an operation of only modest size to someone reared in the Great Plains or the Far West. What this same easterner thinks of as a small farm, his parents may have thought a larger operation a generation ago. The diversity of agriculture, as well as its constant change, reduces the terminology of size to relativity in both place and time.

The term "family farm" has also meant different things to different people in different places and different times. To one person, it may mean the farm on which he was reared; to another, it may mean the farm he aspires to own. On the one hand, the term "family farm" is used to describe the several million farms on which farm families work and live. This may be thought of as the family farm in reality. On the other hand, the term is used to express a number of implied values and goals to which farm people aspire. In the interest of definition, this concept is referred to as the "family farm ideal." This dual use of the term has resulted in confusion. In reality, the family farm frequently differs considerably from the family farm ideal.

As a Nation, we are convinced that the family farm is a desirable objective of public policy. It is cited frequently as symbolic of the American way of life. Even so, the family farm has never been defined precisely. If we as a Nation have decided that the family farm is to be preserved as the basic unit in our farm structure, it is essential that the types of operations we wish to encourage be defined and classified (8). [1/] It is necessary that we know the impact of recent changes on the numbers of operations and their relative stability.

There are no compelling reasons why the family farm should elude definition, as it is a structural characteristic of our farm economy. Farms of this kind furnish homes and occupations for several million farm families. The ideals and the goals for which these families strive probably do not differ from the ideals and goals of those who earn their

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1/ Figures in parentheses refer to Literature Cited, page 73.

living in other occupations. The structure has changed, however, and no doubt the common goals are subject to modification as each unfolding horizon holds new promise.

Economic progress in the United States is associated with a continuing need for adjustments by farmers to meet changing conditions. The course of economic progress has had a double impact on farm families. They are constantly confronted by new techniques intended to increase yields and decrease their needs for labor. At the same time, largely as a result of their own increases in agricultural production, farm families are faced with the fact that fewer people are needed on farms to produce the foods and fibers for an expanding nonfarm population. Farm products constitute largely the necessities of life. As real incomes of the population increase and the basic needs for foods and fibers are met, consumers do not increase their purchases of agricultural products in proportion to their purchases of other commodities. In an expanding economy, it is thus that economic activity is directed toward the other goods and serviees that comprise overall levels of living. This is the essence of economic progress, which depends on the capacity of a successively smaller proportion of the work force to produce the necessities of life, thus releasing workers to fabricate the luxuries.

During the rapid economic growth and development experienced by the United States in recent decades, pressures for adjustments on the part of farm people have been acute. An understanding of the magnitude and direction of changes and their effect on the overall farming structure is essential to the setting up of policies and programs to assist farmers in making orderly adjustments in the interest of a sounder and more profitable agriculture. If there is a family farm ideal that is shared by rural and city people alike, it is the desire for an agriculture in which farm people can share fully in the increasing levels of living provided by an expanding economy.

Early Trends in Numbers of Farms

When the first count of farms was made in the census of 1850, farms were located within the boundaries of all except 11 of the present 48 States. Settlement of the Nation's land frontier was well underway. Explorers, hunters, then farmers and settlers had already ventured to a tier of States west of the Mississippi River. They were in the process of settling the west coast, having bypassed the less humid plains regions. In the decade that followed, more than a half million new farms were added and the acreage of farmland increased by a third (table 1). The westward movement was slowed somewhat in the 1860's. The War Between the States pulled into military service many young men who would

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Table 1. - Farms, land in farms, and population, United States, specified years, 1850-1954

Year	Number of farms	Land in farms	Average size of farm	Population	
				Total	Farm 1/
	Thousands	Million acres	Acres	Millions	Millions
1850	1,449	294	203	23	2/
1860	2,044	407	199	32	2/
1870	2,660	408	153	40	2/
1880	4,009	536	134	50	2/
1890	4,565	623	137	63	2/
1900	5,737	839	146	76	2/
1910	6,362	879	138	92	32
1920	6,448	956	148	107	32
1925	6,372	924	145	115	31
1930	6,289	987	157	123	31
1935	6,812	1,055	155	127	32
1940	6,097	1,061	174	132	31
1945	5,859	1,142	195	140	25
1950 3/	5,382	1,159	216	152	25
1954 3/	4,782	1,158	242	162	22

1/ Agricultural Marketing Service (13, 18).

2/ Not available.

3/ Not entirely comparable with earlier censuses because of a change in the census definition of a farm. See appendix for discussion of changes in the census procedure.

Bureau of the Census (17), except as otherwise stated.

have gone west, but increasing conflict with the Indian nations in the plains regions was also important. The acreage of land in farms was about the same in 1870 as a decade earlier, but the number of farms increased, as an aftermath of the war, partly because of the breakdown of the southern plantation system.

With the successful prosecution of the Indian wars, and aided by congressional enactment that encouraged the homesteading of farms, the last 3 decades of the 19th century saw both farm numbers and land in farms more than double. In 30 years, 3 million farms and 450 million acres of farmland were added. By 1910, the settlement of the western land frontier was virtually complete, climaxing what is a historical marvel in mass migration. The number of farms continued to increase until 1920, which may be considered the turning point in respect to numbers. Increases in total farmland after that date were due mainly to the transfer of public grazing lands in the mountain region to private ownership. Land frontiers were giving way to even greater technological frontiers.

By 1930, the trends in farming that have characterized recent decades were well underway. The census of 1930 showed that the number of farms had declined for the second consecutive 5-year period from the peak reached in 1920. For the most part, the economy of the 1920's was one of general prosperity and high levels of employment. The automobile, and other technological and social innovations, hastened, perhaps, by World War I, lessened the isolation of rural areas. Gasoline tractors and related equipment were becoming available in sizes and types adapted for use on family-size operations. As a result, fewer workers were needed. The rural farm population decreased by more than a million during the decade of the 1920's.

Between 1930 and 1935, farm numbers increased as a result of many factors associated with the depression years. 2/ Unemployment in nonfarm sectors and subsequent lack of nonfarm job opportunities slowed migration from agriculture. Many who had migrated from agriculture during the preceding decade lost their jobs and returned to the farm. The pressure of population on the land created a tendency toward subdivision of farms into smaller units. Many rural residents who had not done so in the previous decade raised farm products for home use to supplement reduced incomes. Low farm prices and meager expectations for profit halted temporarily and in some respects reversed adjustments toward a more efficient agriculture.

2/ The exact extent of the increase in farm numbers between 1930 and 1935 is difficult to determine. The enumeration of farms in the census of 1935 was probably more complete in respect to coverage of small operations than either the 1930 or 1940 censuses.

By 1940, the economy was working its way out of the depression that lingered throughout most of the 1930's. Unemployment was well above the 8 million mark, but this was substantial improvement over the nearly 13 million unemployed in 1933 (appendix table 26). Many of those unemployed earlier had returned to their jobs. The farm population, although it numbered about the same as in 1930, was down 1.5 million from the 32 million reached in 1932-35. The number of farms decreased by 700,000 between 1935 and 1940 but, because of the temporary reversals of the midthirties, there were only 300,000 fewer farms in 1940 than a decade earlier.

Economic conditions improved in the early forties, then boomed in an economy geared to the World War II effort. The drain from agriculture of young men into the Armed Forces and of persons to work in defense plants and installations resulted in an unprecedented movement of people from farms. Between 1940 and 1945, the farm population decreased by 6 million and the number of farms by nearly 250,000.

The decade since World War II has seen a further reduction of nearly 1 million farms. The exact extent of this decrease is difficult to ascertain because of a change in the census definition of a farm, which excluded many small units with nominal production that would have been counted in earlier censuses. Of greater significance in respect to numbers of farms are the internal changes in structure that have tended to be obscured by overall numbers. Commercial farms have become larger and fewer in number. At the same time, an increasing proportion of farm families do not depend primarily on farming for a livelihood.

Growth in the agricultural sector has been accompanied by change in the nature and purpose of individual farm units. In general, this change has taken two directions. Many farmers have increased the scope and efficiency of their farming operations by applying improved techniques. At the same time, the pull of job opportunities in the nonfarm sector induced others to reduce the size of their farm operations and to take up work in nearby towns and factories. Now that electrification and farm-to-market roads have brought city conveniences to most rural areas, many city workers have moved to the country. Some of these rural residents raise farm products for home use and may have a little left over to sell. Merging of farm and nonfarm sectors created a zone in farming that is in contrast to commercial agriculture. In this zone, farming provides only supplementary income and plans for farm production are likely to be influenced by the considerations that affect nonfarm employment.

The Economic Classification of Farms

The economic classification of farms developed by the Bureau of the Census and the Department of Agriculture grew out of the need for a better means of viewing the diversity and change that characterizes farming in the United States. It has proved to be useful in clarifying the concept of a farm. The present economic classification was used for the first time in the census of 1950, and its use was continued in the census of 1954. Its primary objective is the separation of commercial farms from those operated mainly as part-time or residential units.

Commercial farms may be defined broadly as those operated as business units for the purpose of providing the major source of income for the operator family. The basis used for separation was the value of farm sales, the extent of the operator's off-farm work, and other nonfarm income of the farm family. All farms with sales of $1,200 or more were considered commercial farms (table 2). Apparently most of these farms are operated to provide a major source of income for the farm family. In addition, farms with sales of $250 to $1,199 were classified as commercial, provided the farm operator was not employed at an off-farm job as much as 100 days during the year and provided the gross income from farm sales exceeded other income of the family.

The category, other farms, is comprised of farms that are not operated primarily on a commercial basis. "Other farms" include residential, part-time, and abnormal farms. Residential farms are those having farm sales of less than $250. The small size of business on these farms precludes the likelihood of their being operated to provide the major source of income and employment for the operator. Part-time farms are those with farm sales of $250 to $1,199 but whose operators work 100 or more days of the year at an off-farm job or report that income received by the family from other sources is greater than sales from the farm. Abnormal farms include mainly public and private institutional farms, such as college, prison, community, and experiment station farms, and grazing associations.

The other or noncommercial farms are numerous. In 1954, they accounted for approximately a third of all farms. That activity on these farms is not oriented to commercial agriculture may be seen in the relatively small volume of farm sales, which in 1954 amounted to only 2 percent of all farm products sold.

The economic classification of farms is a stride forward. Defining farms as to major purpose or activity has removed many of the cobwebs that in the past have obscured trends in farming. It has given new form

Table 2. - Number and percentage of farms and proportion of market sales, by economic class, United States, 1954

Economic class	Value of sales	Number of farms	Percentage of all farms	Percentage of market sales
	Dollars	Thousands	Percent	Percent
Commercial farms:				
Class I	25,000 and over	134	2.8	31.3
Class II	10,000-24,999	449	9.4	26.9
Class III	5,000-9,999	707	14.8	20.5
Class IV	2,500-4,999	812	17.0	12.1
Class V	1,200-2,499	763	16.0	5.7
Class VI	1/ 250-1,999	462	9.7	1.4
Total	---	3,327	69.6	98.0
Other farms:				
Part-time	1/ 250-1,199	575	12.0	1.5
Residential	Under 250	878	18.3	.3
Abnormal 2/	---	3	.1	.3
Total	---	1,455	30.4	2.0
All census farms -	---	4,782	100.0	100.0

1/ Farms with sales of $250 to $1,199 were classified as part-time if the operator worked off the farm as much as 100 days, or if other income of the operator family exceeded farm sales.

2/ Public and private institutional farms, experiment stations, and so on.

Bureau of the Census (17).

and meaning to comparisons of income and of efficiency both within agriculture and between the farm and nonfarm sectors of the economy. Commercial farms are the going concerns in agriculture. They produce most of the products for sale and account for about two-thirds of the total number of places enumerated as farms. The separation of commercial farms from part-time and residential units defines two distinct sectors within agriculture with marked differences in economic interests and environment.

Economic Classes of Commercial Farms

Dividing commercial farms into economic classes provides a useful measure of the relative importance of different sizes of farm operations. Six size classes of farms are designated on the basis of value of farm sales. Class I farms are the relatively few units that had sales amounting to $25,000 or more. In 1954, there were only 134,000 of these farms.. Nationally, they comprised only 3 percent of the farms in 1954, but they produced nearly a third of the market output. As a group, they are characterized by high investments per farm and per worker and by relatively large expenditures for hired labor.

Farms in economic classes II, III, and IV comprise the bulk of commercial agriculture, in terms of both number of farms and volume of sales. By and large, these represent the family-size farms long considered to be the backbone of American agriculture. Half of the commercial farms are included in these classes, and they produced about two-thirds of the farm products sold in 1954. Class II farms reported sales of $10,000 to $24,999; class III farms had farm sales of $5,000 to $9,999; and class IV farms sold farm products valued at $2,500 to $4,999.

Approximately 1.2 million of the commercial farms had sales of less than $2,500 and are in classes V and VI. These small commercial farms produced only around 7 percent of the farm products in 1954. At the same time, they accounted for 40 percent of the number of commercial farms. Most farm families with chronically low incomes are found on these farms. The small size of the farm business ordinarily does not provide adequate employment for the family labor force. Class V farms reported sales of $1,200 to $2,499 and class VI farms had sales ranging from $250 to $1,199. By definition, the operators of class VI farms did not work at an off-farm job as much as 100 days in the year, and farm sales were greater than the income received by the family from other sources.

As mentioned previously, the census economic classification of farms has proved useful in analyses of the structural characteristics of farming. As this classification of farms is available only in the censuses of 1950 and 1954, however, its use in analysis of changes in farming has been limited. In the study reported here an economic classification of farms was developed for the period 1930 to 1954. This was done with the objective of examining the structural changes in farming that took place during this period. These changes are interpreted in respect to their interrelations with technological developments in agriculture and growth of the economy generally.

Value of Farm Sales as a Measure of Size

Classification by value of sales admittedly has shortcomings as a measure of size. Most important perhaps is that classification on the basis of gross rather than net sales fails to take account of the differences in purchased inputs. This is particularly important when comparisons are made between different types of farms. Poultry farmers, for example, ordinarily have expenses for feed that amount to a considerable proportion of their sales, whereas cotton farmers characteristically have low purchased inputs relative to sales. Classification by gross sales does not take account of the relative difference in productiveness of the two enterprises.

In addition, the classification of farms by value of sales in any given year gives a distorted picture because of farms that, according to factors of chance, have higher or lower than normal production or sales from inventories. The market output of individual farms may vary considerably from year to year, even though in respect to capital, labor and enterprises, the farm organization may remain relatively stable over a period of years. This may be because of fluctuations in yield that arise because of weather or other conditions of production, or because of larger or smaller than normal sales from livestock inventories. Thus, if classification is made in any one year, farms with similar levels of production over a period of years may not fall into the same size class.

It is difficult to measure the exact effect of these transitory factors. Production conditions in a particular year frequently affect certain size groups more than others. Farms affected by abnormal conditions in production of wheat, for example, differ in size from those affected by abnormal conditions in production of cotton. Similarly, cycles in production and sales of beef cattle may affect a different size of farm than cycles in production of hogs.

Classification of farms by normal product added would perhaps approach an ideal measure of size for grouping farms of differing types under diverse conditions of production. Normal product added would correct both for differences in input-output relationships and for annual abnormalities in conditions of production. In the absence of data available for such a classification, however, it is believed that classification by gross value of sales is the best alternative for measuring farm size. It is probable that for large groups of farms, distribution by value of production and value of product added would not differ substantially. The effect of classification by product added would be to decrease the total dispersion. Likewise, classification by normal production rather than by production in any one year would result in some decrease in dispersion.

To sum up, the major limitations in use of farm sales as a measure of size are that (1) it exaggerates the number of extremely large and extremely small farms, and (2) it does not permit minute comparisons of size differentials between regions of markedly different types of farming, unless the different input-output relationships are recognized.

Use of farm output as a measure of size has the advantage of both convenience and availability of data. A farm's contribution to the total production process may readily be reduced to terms of constant volumes of physical production by taking account of price changes. Also, dollar values are adaptable to deflation for changes in overall levels of farm output, an essential element in making relative size comparisons in different time periods. Use of the economic classification of farms as a base point has as an advantage the widespread acceptance of this classification by professional agricultural workers as well as the general public.

Classification of Farms Used in This Report

Developing an economic classification of farms for earlier years was essentially that of (1) adjusting the value intervals for changes that have taken place in price levels for farm commodities, (2) interpolating to determine numbers in similar physical output size groups, and (3) separating commercial farms from part-time and residential units on the basis of off-farm work of the operator and other income of family members (table 3).

In the process of developing an economic classification over time, some modifications were made in the census classification of 1950 and 1954. This was done to obtain a better measure of changes in the number of commercial farms as compared with part-time and residential farms. The census economic classification included as commercial all farms with sales of $1,200 and over. In the classification developed in the study reported here, farms with sales of $1,200 to $2,499 were classed as commercial only if the farm operator did not work off the farm as much as 100 days and if farm sales exceeded family income from other sources. As a result, more than 200,000 farms included as commercial in the census classifications of 1950 and 1954 were classified as part-time in the classification developed here.

To obtain a better measure of changes in part-time and residential farms, the census category of residential farms (sales of less than $250) was examined to provide a category of subsistence farms. Subsistence farms are those on which farm sales of less than $250 apparently represent the major source of income for the operator family.

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Table 3. - Value of sales intervals used in the 1950 and 1954 census economic classification and their equivalent in current dollars for specified earlier census years, United States 1/

Economic class of commercial farms	Value of sales			
	1950 and 1954	1930	1940	1945
	Dollars	Dollars	Dollars	Dollars
Class I----	25,000 and over	14,850 and over	9,550 and over	19,775 and over
Class II ---	10,000-24,999	5,940-14,849	3,820-9,449	7,910-19,774
Class III --	5,000- 9,999	2,970- 5,939	1,910-3,819	3,955- 7,909
Class IV --	2,500- 4,999	1,485- 2,969	955-1,909	1,975- 3,954
Class V ---	1,200- 2,499	715- 1,484	460-954	950- 1,974
Class VI --	250- 1,199	150- 714	95-459	195- 949

1/ Computed by dividing the 1950 and 1954 class intervals by an index of prices received by farmers for farm commodities. See appendix for explanation of procedure used in determining numbers of farms, 1929-44.

In addition, an estimate was made of the number of farms that would have been excluded in earlier censuses had the more restrictive 1950 and 1954 census definition of a farm been used.

Commercial farms were examined for changes in relative size and in real net income from farming. An attempt was made to separate large-scale farms from those that might be considered family size. Also, family farms were examined to separate those that in the current setting ordinarily would be thought of as inadequate in terms of productive employment and income. These modifications and estimates are discussed later in this report and explained in detail in the appendix.

TRENDS IN FARMING BY ECONOMIC CLASS, 1930-54 3/

The years 1930 to 1940

Between 1930 and 1940, the total number of farms decreased by 300,000. More spectacular than the decrease in number of farms during this period was the even greater decrease in number of commercial farms and the growing importance of part-time and residential farms (fig. 1). The number of commercial farms - those on which the farm families derived their major source of income from farming - decreased by nearly half a million. The number of part-time and residential units increased by 250,000 (table 4).

The decrease in number of commercial farms consisted mainly of a reduction in the number of smaller farms and occurred chiefly in the South (table 5, appendix table 26). The number of class V and class VI farms (those with sales of less than $2,500 in terms of 1954 prices) decreased by half a million. The number of class IV farms (sales of $2,500 to $5,000) also decreased slightly, but this was compensated for by increases in the larger output groups. With implementation of acreage and production controls and with the increasing mechanization of farming operations, fewer workers were needed. Sharp cutbacks in acreages of cotton and tobacco displaced many cropper operators throughout the South and changed the work status of others. The number of cropper units decreased by more than 200,000 (table 6). This accounted for much of the decrease in the number of small farms as well as the slight increase in the number of larger farms in the South during this period.

The adjustment process in agriculture operates in response to many factors. It creates what is often described as the push of people from the farm and the pull of people from farming to other occupations. The push is composed of factors that decrease labor needs and, for a given organization, decrease returns to the human agent. The pull depends on the availability and attractiveness of nonfarm employment. Both forces are conditioned by the standards of value and the psychological attitudes toward change held by the persons involved. By necessity,

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3/ The censuses of 1930, 1940, 1945, and 1950 were taken in the winter or early spring of those years. The total number of farms was taken as of the date of enumeration, but production and, hence, classification by value are based on the preceding calendar year. As the census of 1954 was taken in the fall, both farm numbers and value of production relate to the calendar-year 1954.

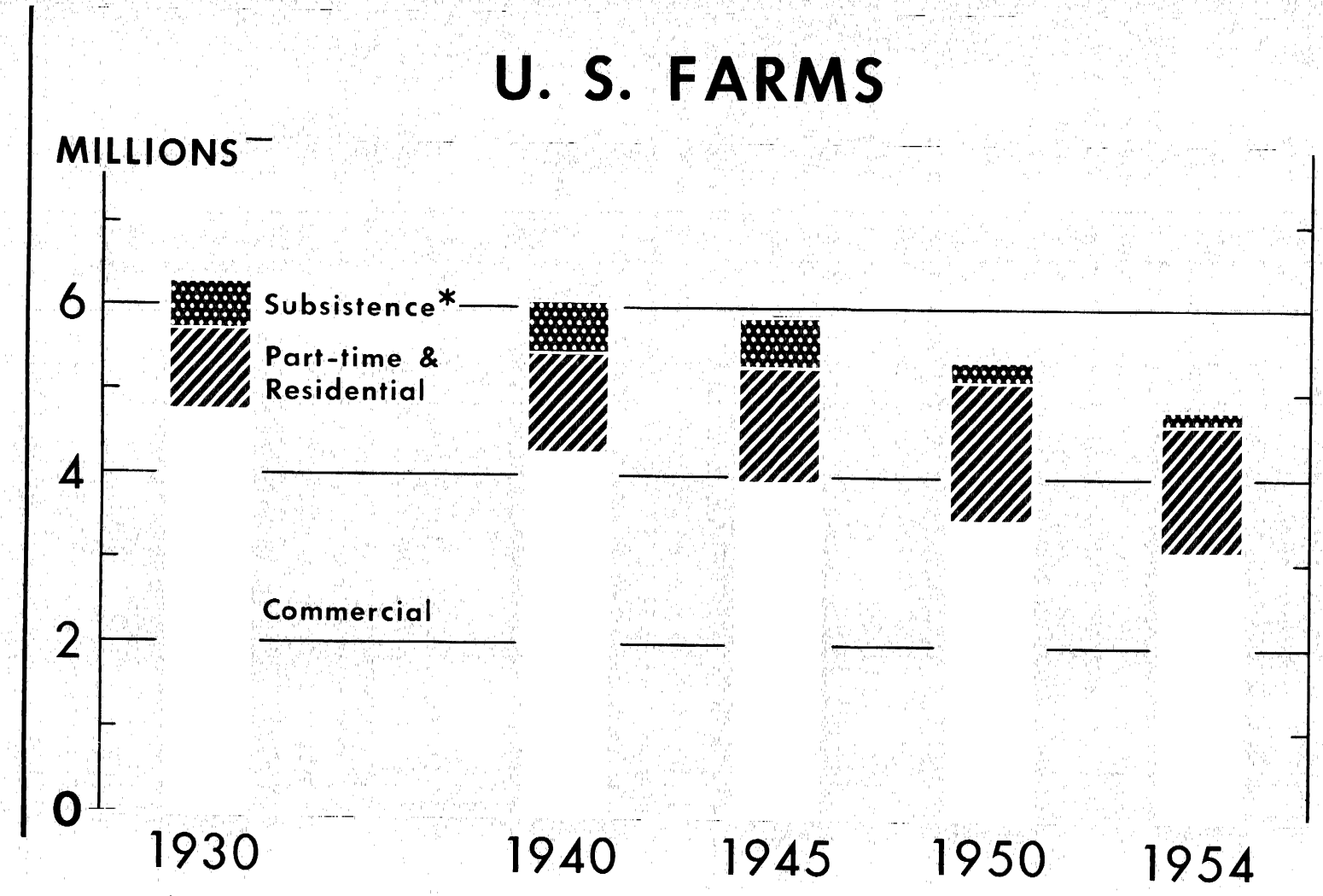
U. S. FARMS
MILLIONS
6
4
2
0
Subsistence*
Part-time &
Residential
Commercial
1930
1940
1945
1950
1954
*EARLIER YEARS INCLUDE SOME PLACES NOT REGARDED AS FARMS IN 1950 AND 1954 CENSUSES
DEVELOPED IN ARS FROM CENSUS DATA
U. S. DEPARTMENT OF AGRICULTURE
NEG. 56 (11) - 2238 AGRICULTURAL RESEARCH SERVICE

Figure 1

Table 4. - Number of farms by economic class, United States, specified years, 1929-54

Economic class	Value of sales (1954 prices) 1/	Number of farms				
		1929	1939	1944	1949	1954
	Dollars	Thou.	Thou.	Thou.	Thou.	Thou.
Commercial farms:						
Class I	25,000 and over	47	60	91	103	134
Class II	10,000-24,999	205	252	347	381	449
Class III	5,000- 9,999	560	585	723	721	707
Class IV	2,500- 4,999	1,078	1,015	976	882	811
Class V	2/ 1,200- 2,499	1,274	1,070	867	661	536
Class VI	2/ 250- 1,199	1,559	1,283	937	717	463
Total 3/	---	4,723	4,265	3,941	3,465	3,100
Noncommercial farms:						
Part-time and residential	4/Under 2,500	924	1,181	1,345	1,670	1,507
Subsistence	2/Under 250	556	504	393	247	175
Total	---	1,480	1,685	1,738	1,917	1,682
Excluded by revised definition 5/	---	86	147	180	---	---
All census farms	---	6,289	6,097	5,859	5,382	4,782

1/ Value intervals in early years deflated to 1954 level of prices received by farmers for farm products. See appendix for details of method used.

2/ With operator not working off the farm as much as 100 days and farm sales greater than income of family members from off-farm sources.

3/ In this and subsequent tables, 4,000 farms classified as abnormal in 1949 and 2,000 so classified in 1954 are included. These farms, public and private, institutional, experiment station, and so on, were not separated in earlier censuses. They are therefore included in census data for earlier years also.

4/ With operator working off the farm 100 or more days, or other income of family members exceeding sales from the farm.

5/ Farms listed in earlier censuses that would not have met the minimum criteria used in the censuses of 1950 and 1954. See appendix for details of procedure for estimating.

Table 5.- Number and percentage of specified economic classes of commercial farms, United States and major geographic divisions, specified years, 1929-54

NUMBER OF FARMS

Geographic division and economic class of farm 1/	Value of sales (1954 prices) 2/	1929	1939	1944	1949	1954
	Dollars	Thou.	Thou.	Thou.	Thou.	Thou.
United States:						
Class I	25,000 and over	47	60	91	103	134
Classes II, III, and IV	2,500-24,999	1,843	1,852	2,046	1,984	1,967
Classes V and VI	3/ 250-2,499	2,833	2,353	1,804	1,377	999
All commercial farms	---	4,723	4,265	3,941	3,465	3,100
North and West:						
Class I	25,000 and over	37	44	71	75	98
Classes II, III, and IV	2,500-24,999	1,386	1,340	1,461	1,429	1,364
Classes V and VI	3/ 250-2,499	1,050	907	595	468	354
All commercial farms	---	2,473	2,291	2,127	1,972	1,816
South:						
Class I	25,000 and over	10	16	20	28	36
Classes II, III, and IV	2,500-24,999	457	512	585	556	603
Classes V and VI	3/ 250-2,499	1,783	1,446	1,209	909	645
All commercial farms	---	2,250	1,974	1,814	1,493	1,284

PERCENTAGE OF FARMS

	Dollars	Percent	Percent	Percent	Percent	Percent
United States:						
Class I	25,000 and over	1.0	1.4	2.3	3.0	4.3
Classes II, III, and IV	2,500-24,999	39.0	43.4	51.9	57.6	63.5
Classes V and VI	3/ 250-2,499	60.0	55.2	45.8	39.4	32.2
All commercial farms	---	100.0	100.0	100.0	100.0	100.0
North and West:						
Class I	25,000 and over	1.5	1.9	3.3	3.9	5.4
Classes II, III, and IV	2,500-24,999	56.0	58.5	68.7	72.7	75.1
Classes V and VI	3/ 250-2,499	42.5	39.6	28.0	23.4	19.5
All commercial farms	---	100.0	100.0	100.0	100.0	100.0
South:						
Class I	25,000 and over	.4	.8	1.1	1.9	2.8
Classes II, III, and IV	2,500-24,999	20.3	25.9	32.2	37.3	47.0
Classes V and VI	3/ 250-2,499	79.3	73.3	66.7	60.8	50.2
All commercial farms	---	100.0	100.0	100.0	100.0	100.0

1/ The geographic divisions include the following regions and States: North: New England - Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut; Middle Atlantic - New York, New Jersey, Pennsylvania; East North Central - Ohio, Indiana, Illinois, Michigan, Wisconsin; West North Central - Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas; West: Mountain - Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada; Pacific - Washington, Oregon California; South: South Atlantic - Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida; East South Central - Kentucky, Tennessee, Alabama, Mississippi; West South Central - Arkansas, Louisiana, Oklahoma, Texas.

2/ Value intervals in earlier years deflated to 1954 levels of prices received by farmers. See appendix for method used.

3/ Excludes farms on which the operator worked off farm as much as 100 days or the income of the operator and family members from off-farm sources exceeded sales from the farm.

Table 6. - Number of cropper farms, geographic divisions of the South, specified years, 1930-54

Geographic division 1/	Number of cropper farms				
	1930	1940	1945	1950	1954
	Thou.	Thou.	Thou.	Thou.	Thou.
South Atlantic	245	177	177	142	112
East South Central	281	232	180	144	115
West South Central	250	132	90	61	46
South	776	541	447	347	273

1/ For a list of States in each geographic division, see footnote 1, table 5, page 20.

Bureau of the Census (17).

orderly adjustments in agriculture require that the pull and push operate simultaneously. A poignant commentary on the process during the 1930's is that the push continued undiminished while the pull was virtually non-operative. The reduction in numbers of small farms, which had never provided socially acceptable levels of income even with favorable farm prices, might have been hailed as progress if nonfarm employment had been generally available.

The increase in numbers of part-time and residential farms during the 1930's and the slight reduction in the number of subsistence units indicate that some local alternatives were available. The Works Progress Administration and the Public Works Administration helped to ease the hardship. It is probable that some of the small commercial farms became part-time because their operators were on a relief-oriented government payroll.

The economic stagnation of the 1930's and the subsequent recovery may be likened to a dam that impedes, overruns, then collapses in a surge of pent-up energy. At a time when advances were being made in the science and implements of farm production, the combination of depressed farm prices, a gloomy outlook, and rigid farm costs retarded adoption of these new techniques by farmers. Lack of alternatives to

farming resulted in an actual increase in number of persons per farm and a decrease in income per capita at a time when improvements in transportation and communications were bringing rural people increasingly under the influence of urban tastes and customs.

The World War II Years

The World War II years are generally considered to be some of the more striking years in terms of changes in farming. This is true in contrast with the 1930's. During the 1940's, the total number of census farms decreased by only 238,000 but the number of commercial farms decreased by 324,000. The decrease in number of commercial farms was partly offset by an increase of 164,000 in the number of part-time and residential units.

In the 1940-45 period, farmers stepped up production on existing acreages. The period was marked as well by consolidation of farms into larger units. An all-out need for production of food stimulated the rapid adoption on farms of a variety of production innovations. Improved varieties of seed and increased use of commercial fertilizers boosted crop yields. Profitable investments were made in better strains of breeding stock to upgrade herds and flocks. In conjunction with modern machinery and mechanical power, these developments enabled a shrinking farm-labor force to respond with a tremendous surge in production. The physical volume of farm products marketed for sale increased by slightly more than a fourth (table 7). As the number of commercial farms decreased by 324,000, this meant that, on the average, the physical volume of marketings per commercial farm increased by about a third. Measured in terms of business volume, this was an unprecented increase in the size of farm operations.

Farms with sales of $5,000 or more (measured in terms of 1954 prices) increased by 30 percent; those with sales of $10,000 or more by 40 percent. This was accompanied by a decrease in numbers of class V and class VI farms of nearly half a million, and a slight decrease in numbers of class IV farms (fig. 2).

The substantial increase in the number of farms in the large volume of sales categories between 1940 and 1945 may need some explanation at this point. The reduction in commercial farm numbers and the shifting of farms into higher output categories might give the reader an impression that during this period there was a strong tendency toward consolidation of farms and concentration of farmland into larger acreage units. Some enlargement of farms took place through consolidation, but

Table 7. - Index numbers of farm production, farm output, farm labor, and farm output per man-hour, United States, specified years, 1929-54

(1947-49 = 100)

Year	All crops	All livestock and livestock products	Feed used by farm horses and mules	Farm output	Man-hours of labor used for farm-work	Farm output per man-hour
1929	79	77	227	74	136	54
1939	82	85	171	80	121	66
1944	96	105	140	97	120	81
1949	101	103	90	101	97	104
1954	101	117	51	108	86	126

Changes in Farm Production and Efficiency (15).

indications are that increases in output were predominately a result of increased output per acre. Production was intensified on farms by putting more of the land into harvested crops and pasture and obtaining higher yields per crop acre and per animal unit.

A simple portrayal of this is obtained by picturing the 25-percent increase in output as applying equally to all farms. It is obvious that there would be a substantial movement of farms into higher value categories. In reality, however, the assumption of equal increases in intensity per acre among size groups is not sufficient. Indications are that considerably greater increases in intensity of farming operations took place on the smaller units (6). Operators of these unit had lagged in adopting new techniques, and their response to high farm prices was a rapid assimilation of modern practices. The larger farms, which were more up to date, did not have as far to go. In fact, labor shortages affected the larger farms more than the smaller units, which depended primarily on family labor. This may have resulted in shifts to more extensive enterprises on some of the larger units. In the attempt to explain and develop a dynamic measure of size, these and similar developments are discussed more fully later in this report.

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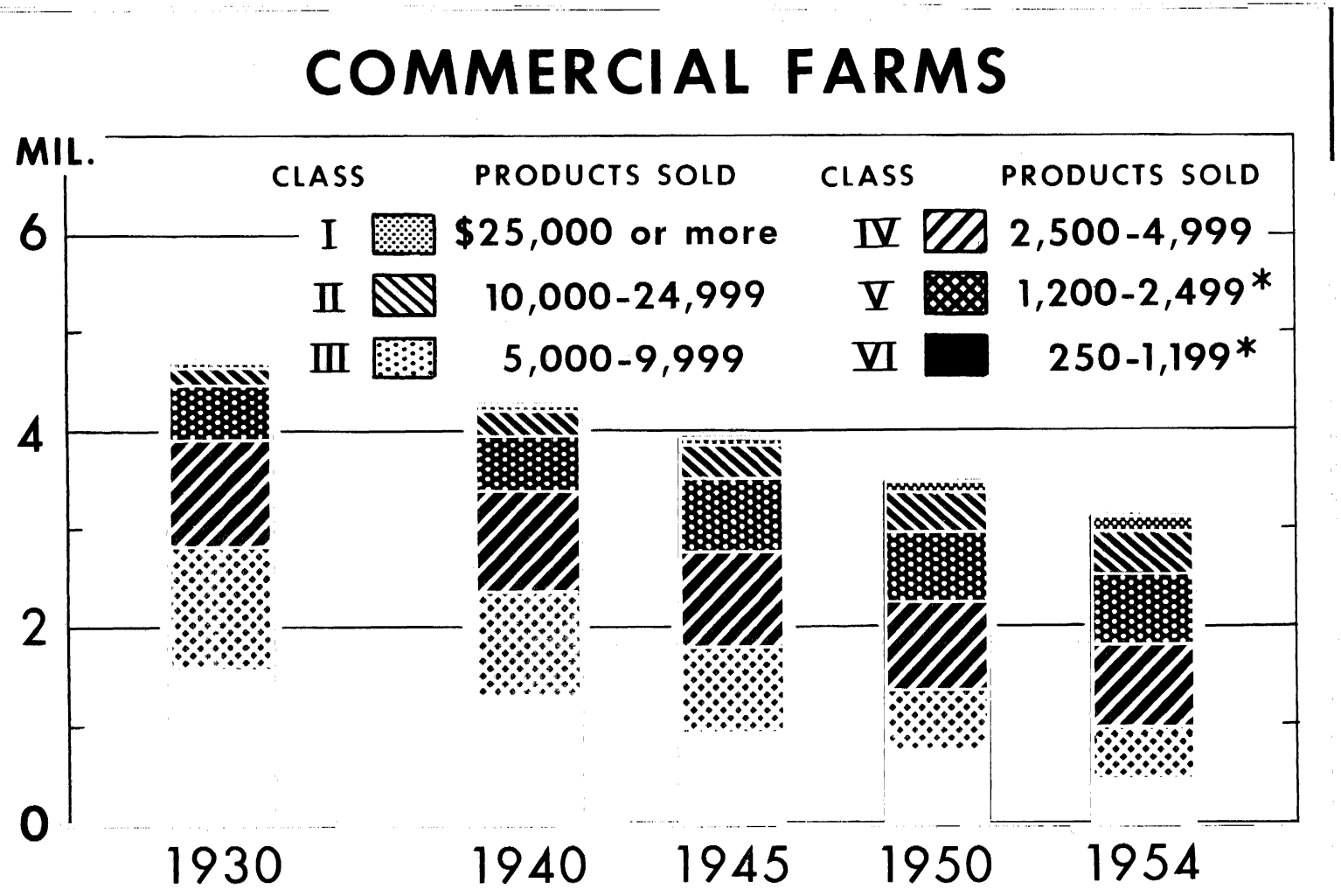
COMMERCIAL FARMS
MIL.
6
4
2
0
CLASS
PRODUCTS SOLD
CLASS
PRODUCTS SOLD
I
$25,000 or more
II
10,000-24,999
III
5,000-9,999
IV
2,500-4,999
V
1,200-2,499*
VI
250-1,199*
1930
1940
1945
1950
1954
*FARM OPERATOR NOT WORKING OFF THE FARM AS MUCH AS 100 DAYS AND FARM INCOME EXCEEDING INCOME FROM OTHER SOURCES
U. S. DEPARTMENT OF AGRICULTURE
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Figure 2

From War to Peacetime - Production

The high levels of production brought forth by World War II were surpassed in the years that followed. The slogan, "food to win the peace" supplanted the slogan, "food to win the war" and farm prices were high because of the demand for food by the hungry peoples of Europe. Mechanization of farms continued at an even more rapid pace as farm machinery, scarce during the war, became available in increasing quantity. Farm population, which had declined by 6 million during the World War II years, increased in the years immediately following as many servicemen and defense-plant workers returned to farms. This increase was only temporary, however, and by 1950 the farm population was back to about the same level as in 1945.

The trend toward larger commercial farms continued because of further increases in production per acre, as well as consolidation of farms into larger acreage units. The preceding decade had seen the accumulation on farms of a great quantity and variety of mechanical equipment, and by 1950, horseless farming was well on its way to becoming a reality. Farmers who had bought tractors and related machines often found that they could handle additional acreages with the same equipment and with the same or a smaller labor force. Many obtained additional land nearby to enlarge their farms and others rented or bought larger acreage units. It is probable that the trend toward larger sizes of business during these years was due more to enlargement of the acreage in farms than to increased output per acre. Farm output increased by only 4 percent. Compared with the phenomenal increase of nearly a fourth during the 5 preceding years, this was a small increase.

Data on number of farms by size of acreage groups bear this out to some extent (table 8). Increases in numbers of farms in the larger acreage classes have been at a fairly constant rate since 1940. The increase in size of acreage between 1940 and 1945 resulted partly from an increase of about 80 million acres in land in farms. A major part of this occurred in the grazing areas of the West through sales of public lands to private owners. The average size of all census farms increased by about 20 acres in each 5-year period between 1940 and 1950, but the average acreage per commercial farm showed a slightly greater increase during the later forties than during the World War II years (table 9).

The decrease in total number of farms, when allowance is made for the change in the census definition of a farm, was about 300,000 between 1945 and 1950 as compared with 270,000 in the 5 preceding years. The number of commercial farms, however, decreased by nearly a half

Table 8. - Number of farms by size of acreage group, United States, specified years, 1930-54

NUMBER OF FARMS

Item	1930	1940	1945	1950	1954 1/
	Thousands	Thousands	Thousands	Thousands	Thousands
Under 10 acres	359	506	595	485	484
10-49 acres	2,000	1,780	1,654	1,478	1,213
50-99 acres	1,374	1,291	1,157	1,048	864
100-179 acres	1/1,388	1,279	1,200	1,103	953
180-259 acres	1/ 476	517	493	487	464
260-499 acres	451	459	473	478	482
500-999 acres	160	164	174	182	192
1,000 acres and over	81	101	113	121	130
All census farms	6,289	6,097	5,859	5,382	4,782

AVERAGE SIZE OF FARM

	Acres	Acres	Acres	Acres	Acres
All census farms	157	174	195	215	242
Commercial farms	2/	220	255	3/ 300	3/336

1/ Corrected for comparability with more recent census data.
2/ Not available.
3/ See table 4, page 19, for definition.

Bureau of the Census (17), except as otherwise stated.

Table 9. - Number and percentage of farms in specified economic classes, United States and major geographic divisions, specified years, 1929-54

Geographic division and economic class 1/	1930		1940		1945		1950		1954	
	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage
	Thou.	Pct.	Thou.	Pct.	Thou.	Pct.	Thou.	Pct.	Thou.	Pct.
United States:										
Commercial	4,723	75.1	4,265	69.9	3,941	67.3	3,465	64.4	3,100	64.8
Part-time and residential 2/	924	14.7	1,181	19.4	1,345	22.9	1,670	31.0	1,507	31.5
Subsistence 2/	556	8.8	504	8.3	393	6.7	247	4.6	175	3.7
Excluded by definition 2/	86	1.4	147	2.4	180	3.1	---	---	---	---
All census farms	6,289	100.0	6,097	100.0	5,859	100.0	5,382	100.0	4,782	100.0
North and West:										
Commercial	2,473	80.7	2,291	74.1	2,127	71.4	1,972	72.3	1,816	73.7
Part-time and residential 2/	406	13.2	543	17.6	630	21.2	695	25.4	601	24.4
Subsistence 2/	159	5.2	180	5.8	123	4.1	64	2.3	47	1.9
Excluded by definition 2/	28	.9	76	2.5	98	3.3	---	---	---	---
All census farms	3,066	100.0	3,090	100.0	2,978	100.0	2,731	100.0	2,464	100.0
South:										
Commercial	2,250	69.8	1,974	65.6	1,814	63.0	1,493	56.3	1,284	55.4
Part-time and residential 2/	518	16.1	638	21.2	715	24.8	975	36.8	906	39.1
Subsistence 2/	397	12.3	324	10.8	270	9.4	183	6.9	128	5.5
Excluded by definition 2/	58	1.8	71	2.4	82	2.8	---	---	---	---
All census farms	3,223	100.0	3,007	100.0	2,881	100.0	2,651	100.0	2,318	100.0

1/ For a list of regions and States in each geographic division, see footnote 1, table 5, page 20.
2/ See value of sales criteria and footnotes to table 4, page 19.

million. This decrease was partly offset by an increase of more than 300,000 in numbers of part-time and residential units. The decrease in the number of commercial farms was almost entirely among the small farms in classes V and VI. Obviously, many of these farms did not disappear from agriculture. They became part-time farms by virtue of the operator or family members having off-farm sources of income.

Decreases in numbers of small commercial farms occurred along with increasing numbers of part-time and residential farms in each geographic region of the country. In terms of numbers, however, these decreases were of greatest importance in the South (table 9, appendix table 27). Most of the small farms in classes V and VI are in the South, and families on these low-income farms have had the greatest incentive to supplement their incomes through off-farm work. Also, the number of cropper units in the South (which fall predominantly within the class V and class VI groups of farms) decreased by another 100,000 during this period.

The unprecedented growth of part-time farming was the result of factors associated with the general growth and development of both farm and nonfarm sectors of the economy. The benefits from improved technology in farming were not shared equally by all areas or by all types and sizes of farms. Hilly land and small plots limited the adaptability of machines in some areas. Operators of many small commercial farms did not find it economical to use even the smallest sizes of tractors and machines. At the same time, retail and other services in rural areas increased tremendously, because of the increasing proportion of farm inputs purchased by farmers and the larger disposable incomes of farm people. This, along with continued expansion of industries in rural areas, provided local alternatives to farming that had not existed before. Earnings from farming on some of the smaller units in agriculture could not compete with nonfarm wages, and many farm operators and members of their families took advantage of attractive job openings nearby. Many servicemen, whose horizons had been broadened by outside contacts, returned to the farm to live, but frequently took jobs in town.

In 1950, the number of part-time farms was larger than ordinarily would have been the case because of the number of veterans who were taking on-farm training under the laws administered by the Veterans Administration. In the 1950 fiscal year, more than 300,000 veterans were enrolled in the on-farm training program under Public Laws 16 and 346 (table 10). In addition, many veterans lived at home on the farm while taking other types of vocational training or schooling under

Table 10. - Average number of veterans enrolled annually in institutional on-farm training under laws administered by the Veterans' Administration, United States, 1945-55 1/

Fiscal year	Total	Public Law 346	Public Law 16	Public Law 894	Public Law 550
	Thousands	Thousands	Thousands	Thousands	Thousands
1945	0.2	0.1	0.1	---	---
1946	12.0	11.5	.6	---	---
1947	99.8	91.7	8.2	---	---
1948	232.4	208.4	24.0	---	---
1949	309.2	272.6	36.7	---	---
1950	348.7	305.6	43.1	---	---
1951	320.8	285.0	35.8	---	---
1952	252.3	229.8	22.5	2/	---
1953	135.1	122.1	11.7	.2	1.1
1954	70.6	53.2	5.5	.5	11.4
1955	47.5	16.6	2.6	1.1	27.2

1/ Public Law 346, 78th Congress (Servicemen's Readjustment Act of 1944), is popularly known as the "GI bill" for World War II veterans. Public Law 550, 82d Congress (Veterans' Readjustment Assistance Act of 1952), authorized education and training benefits to veterans of the Korean emergency period. Public Law 16, 78th Congress, authorized training benefits for disabled World War II veterans found to be in need of vocational rehabilitation. Public Law 894, 81st Congress, authorized an extension of Public Law 16 benefits for disabled veterans of the Korean emergency period.

2/ Less than 50 veterans.

United States Veterans' Administration.

the GI bill. Payments to veteran trainees, in many instances, were a more important source of income than sales from the farm, and this met the criterion for classification as part-time farms.

Contrasting the Early with the Late Forties

Both the total number of farms and the number of commercial farms decreased more rapidly between 1945 and 1950 than in the 5 preceding years. This offers a contrast to the trends in farm population. From 1940 to 1945, farm population decreased by about 6 million, but during the years that followed the war many persons returned to farms. In 1950, the farm population numbered about the same as it had 5 years earlier. Employment of persons on farms, however, declined at about the same rate during both periods (appendix table 25). The rapid movement of people away from agriculture during the early forties was partly a catching-up process. Many persons who would have left the farm during the previous decade had probably been prevented from doing so by the lack of employment opportunities.

It is also likely that other factors of the World War II years worked to prevent a greater reduction in numbers of commercial farms. Farm prices were good and farming was profitable as it had not been for a generation. To some extent, this offset the lure of attractive nonfarm wages and salaries. Retirement of older people from farming was delayed because of the good returns from farming, the patriotic urge to participate on the home front, and the desire to "keep the home fires burning" for sons away in the service. The census of 1945 counted a higher proportion of farmers 55 and older than was counted in the census of either 1940 or 1950 (table 11).

The war years were years of caution on the part of many farm people. Psychological attitudes governing change were conditioned by the fairly recent experience with a "boom or bust" economy and the instability of nonfarm jobs. Much of the outmovement of persons from farming during these years was to jobs directly connected with or created by the war effort. Many who left planned to return after the war. Even when whole families left, they were reluctant to sell the land as it represented a degree of security not associated with employment in the city. Ordinarily, movement of people from agriculture is accompanied by a decrease in number of farms and consolidation of farms into larger units. Although some consolidation of farms occurred during the war years, apparently it was slower than the rapid movement of people out of agriculture would ordinarily have indicated.

Table 11. - Proportion of farm operators in selected age groups, United States, specified years, 1930-50

Age group	1930	1940	1945	1950	1954
	Percent	Percent	Percent	Percent	Percent
Under 35	23.4	20.3	17.2	18.9	15.1
35-54	48.0	45.9	47.6	46.5	48.0
55-64	17.5	19.6	20.2	19.8	20.3
65 and over	11.1	14.2	15.0	14.8	16.6
All ages	100.0	100.0	100.0	100.0	100.0

Bureau of the Census (19).

Farm prices doubled between 1939 and 1944 and net cash income of farm operators from farming more than tripled (table 12). It is characteristic of agriculture that increasing incomes from farming tend to be reflected in higher prices for land, but land values rose by only a third between 1939 and 1944. Mortgage indebtedness decreased by a fifth. This probably indicates some reluctance on the part of farmers to buy land with which to enlarge their farms. The scarcity of farm labor was also an important factor.

The years 1950 to 1954

The relatively small decrease in total number of farms coupled with the rapid shift from commercial to part-time farming is a curious phenomenon of the period between 1945 and 1950. It makes more startling the decrease of 600,000 in total numbers of farms since 1950, as reported in the 1954 Census of Agriculture. Between 1950 and 1954, commercial farms decreased in number by 365,000 and noncommercial farms by 235,000. The farm population declined by 3 million. The decrease in number of commercial farms was slightly less than the decrease from 1945 to 1950, but the reduction in number of farms and the exodus of farm people, when taken together, are unprecedented in United States history. To say that a decrease of this magnitude might have been expected would be largely hindsight. Farm to nonfarm migration is an integral part of the process of economic adjustment, but too little is known about the actual steps involved to explain this

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Table 12.- Farm prices, income, value of real estate, and mortgage debt, United States, specified years, 1939-54

(Index, 1939 = 100)

Year	Prices received by farmers 1/	Net cash income of farm operators from farming 2/	Value of farm real estate per acre 3/	Farm mortgage debt 4/
1939	100	100	100	100
1944	207	355	136	80
1949	263	322	210	78
1954	262	315	246	113

1/ Agricultural Prices (10).
2/ Farm Income Situation (11).
3/ Farm Real Estate Situation (16).
4/ Agricultural Finance Review (14).

phenomenon completely. Instead, an attempt is made here to analyze and explain some of the underlying forces that have apparently had great impact on agriculture in the 1950's.

The major factor that cannot be ignored is the strength of the pull of nonfarm alternatives during the early fifties. At first glance, the increase in total employment of only 1 million between 1950 and 1954 is not impressive in terms of economic growth. This increase was accompanied, however, by a decrease in farm employment of 1 million, making altogether a net increase in nonagricultural employment of 2 million. In addition, expansion in the Armed Forces, which began with the Korean conflict in 1950, kept 2 million young men out of the civilian labor force. In terms of opportunities for migration, the pull was stronger, perhaps, in the 1950's than in the 5 preceding years.

In the late forties, "full employment" was a familiar term. Nonagricultural employment increased by 6 million between 1945 and 1950. But during these years the economy was in process of conversion from war to peacetime production. At the same time, it had to absorb more

than 10 million returning servicemen into the civilian labor force. Increased competition for jobs may have meant fewer opportunities for farm people of the type that would encourage complete migration rather than partial dependence on farming.

The rapid outmovement of farm people and the decrease in the number of farms between 1950 and 1954 have resulted in considerable speculation as to what these trends imply. Apprehension about changes of this magnitude in so vital a sector of the economy is the rational reaction of an informed public. Anxiety has stemmed largely from concern over the family farm during a period when rising costs and falling farm prices have contributed to serious production problems in commercial agriculture. It is understandable that many have taken the decrease in farm numbers and farm population as evidence that the family farm is being displaced in American agriculture.

The decrease in commercial farms between 1950 and 1954 was almost entirely among the farms in classes V and VI that have a volume of production of less than $2,500. These farms disappeared rapidly from agriculture in this country in the quarter-century ending in 1954. The decrease in the number of these farms continued unabated under the depressed economic conditions of the 1930's, as well as during the last 15 years of unparalleled prosperity in the economy at large (fig. 3). Indications are that the adjustments that brought about the decline in the number of these small farms were made in response to more attractive job opportunities outside agriculture and opportunities for increasing the size of the farm business within agriculture.

In addition to the decrease of nearly 400,000 in the number of farms in classes V and VI, subsistence farms decreased by more than 50,000 between 1950 and 1954 and part-time and residential units decreased by almost 150,000. Decreases in numbers of part-time farms probably resulted partly from discontinuance of food production for home use and from incidental sales by some families who had increased their earnings in nonfarm jobs. This would retire their places from the census count of farms. Also, by 1954, most of the World War II veterans who were enrolled in on-farm training under the GI bill in 1949 had completed their courses and were no longer eligible for payments under the program.

Fairly extensive shifting from small commercial to part-time farming has been a characteristic of recent decades. If, as is often assumed, part-time farming is a step in the process of farm to nonfarm migration, it is likely that a focal point in the exodus of farm people

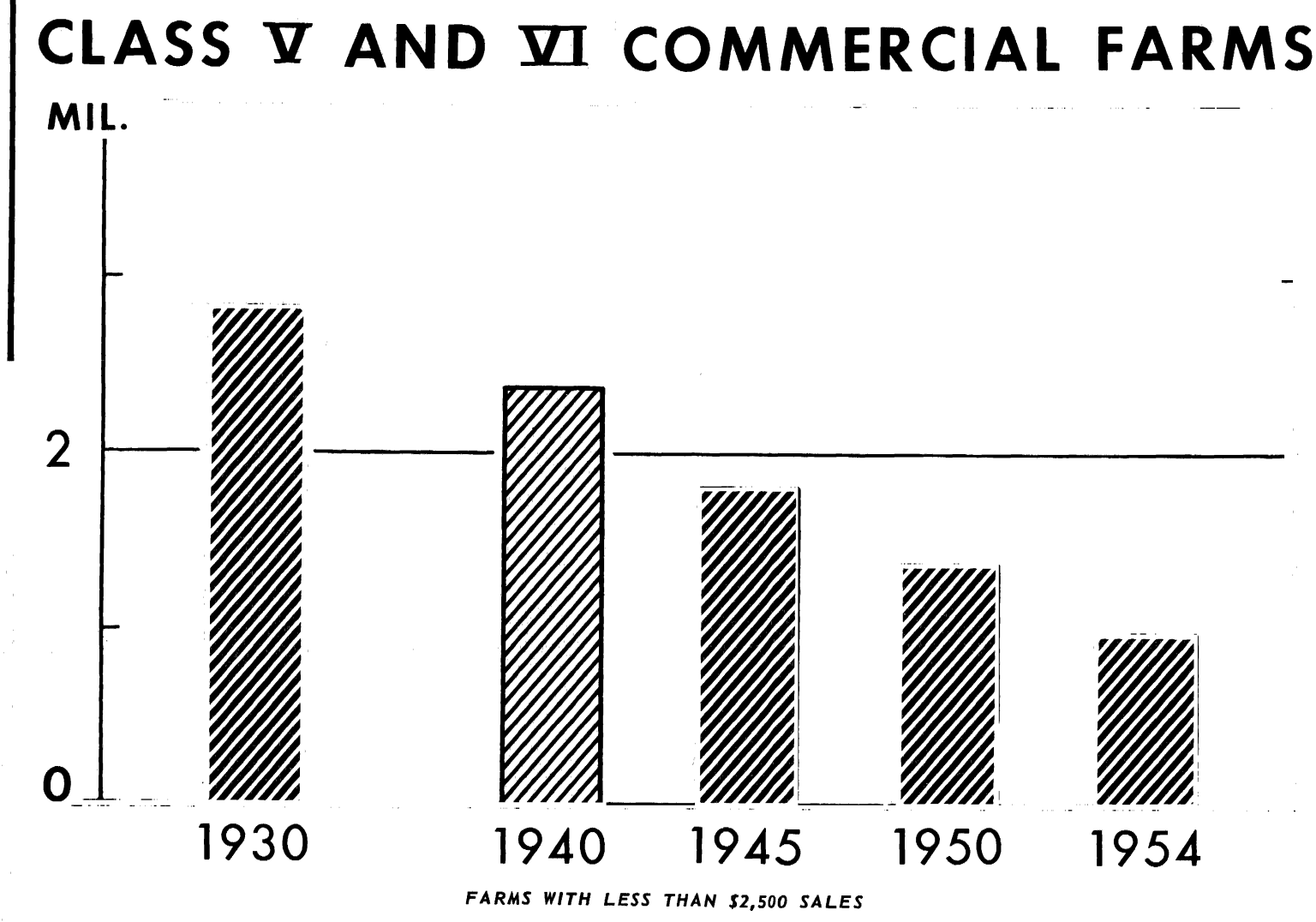
CLASS V AND VI COMMERCIAL FARMS
MIL.
2
0
1930
1940
1945
1950
1954
FARMS WITH LESS THAN $2,500 SALES
U. S. DEPARTMENT OF AGRICULTURE
NEG. 56 (12) - 2254 AGRICULTURAL RESEARCH SERVICE

Figure 3

was among those already engaged in part-time farming. It is probable that there was a substantial shift in classification from commercial to part-time farming, although the number of part-time farms decreased.

In analyzing the decrease in the number of small farms, the effect of technological and social innovations on the customs, attitudes, and capabilities of farm people should not be ignored. A rural generation reared in an environment of radios and automobiles, educated in consolidated schools, and accustomed to an increasingly higher level of living is more cognizant of outside opportunities and also possesses greater mobility. So long as there remains a substantial part of agriculture with incomes chronically below incomes both from the more adequate family farms and from nonfarm work, and so long as alternative employment opportunities exist, the number of small commercial farms is likely to continue to decline. This is not to imply that small commercial farms are doomed to extinction. There will always be persons with limited capabilities - elderly and disabled persons and those who lack sufficient training for other occupations - to whom a small farm represents a better living or at least one comparable to the living that might be obtained in other occupations. But as a business to provide the major source of income to able-bodied farm-operator families, it is probable that nothing short of serious economic recession could reverse this trend of fewer small farms as measured by volume of output.

Trends in Management Units in the South

Changes in the numbers and sizes of farms in the South are related closely to changes in the number of cropper operations and the resulting effect on management units. As mentioned previously, the number of cropper units had decreased from 776,000 in 1929 to 273,000 in 1954. This decrease in the number of cropper operations accounts for a considerable proportion of the overall decrease in farm numbers in South since 1930. As the cropper units are not farms from the standpoint of management, the indicated decrease in number of farms in the South is not comparable to statistics of changes for other regions of the country. Decreases in the number of cropper units do not indicate corresponding decreases in the number of management units. Instead, these decreases represent reorganization within management units to more mechanized operations and to systems of farming that require less labor.

Excluding cropper units from commercial farms in the South results not only in fewer farms but also in a substantial change in the trend in numbers of commercial farms (table 13). On a management-unit basis, commercial farms in the South numbered 1.6 million in 1930. Between

Table 13. - Number of commercial farms on the basis of management units, United States and major regions, specified years, 1930-54

United States and major regions 1/	Number of farms 2/				
	1930	1940	1945	1950	1954
	Millions	Millions	Millions	Millions	Millions
Commercial farms: 3/					
United States	4.1	3.8	3.5	3.2	2.9
North and West	2.5	2.3	2.1	2.0	1.8
South	1.6	1.5	1.4	1.2	1.1

1/ For a list of States included in each geographic division, see footnote 1, table 5, page 20.

2/ Adjusted to a management-unit basis by estimating the number of commercial farms exclusive of cropper units in the South.

3/ All farms (excluding cropper units) with sales of $2,500 or more and those with sales of $250 to $2,500 provided the farm operator did not work off the farm as much as 100 days and farm sales were less than other income received by the family from off-farm sources. Value is expressed in terms of 1954 prices for farm commodities. The value intervals were adjusted to take account of changes in prices received by farmers.

1930 and 1945, the number decreased by about 200,000. In the decade that ended with 1954, the decrease was more rapid; it amounted to approximately 300,000. On a management-unit basis, the trend in the number of commercial farms in the South is similar to that for the rest of the United States. This is in contrast to the more rapid decrease in commercial farms indicated for the South if all census farms rather than management units are considered. (See table 5 for comparison.)

Management units in the South also differ in size from census farms. Comparisons were made of the number of management units and census farms, by economic class, in selected areas in 1945 (2). When farms were grouped on a management basis, the number of larger farms

increased substantially and the number of smaller units decreased. There were nearly twice as many management units as census farms with sales of $20,000 or more and half again as many with sales of $8,000 to $19,999. On a management-unit basis there were correspondingly fewer farms in the smaller size groups. On this basis, total number of farms was a fourth less than the count of census farms.

The trends in the number of management units in the South are important in any analysis of the problems of farm organization, production efficiency, and opportunities for farm adjustments. Much of the apparent trend in recent decades toward decreasing numbers and increasing sizes of farms in the South has resulted from changes that have taken place on multiple units. Mechanization of these farms decreased labor needs and as a result, fewer croppers were needed. Frequently, also, mechanization was accompanied by substantial reorganization of the entire management unit. This changed the work status of other croppers to that of hired laborers. Changes in farming that have shown up in other regions than the South in extensive reductions in the number of hired workers have been reflected in the South by reductions in the number of cropper farms and a somewhat greater emphasis on hired labor on the larger farms.

Changes in number of management and cropper units in the South have significant implications for future development. Opportunities for adopting technological developments have, perhaps, been greater on the multiple units. By and large, these farms were in areas suited to mechanized operations and, when the land in subunits was taken together, they were of sufficient size to use tractors and related equipment efficiently. Operators of these farms have been able to adjust to labor needs by adjusting the number of croppers. On the multiple units, adjustments to a more efficient agriculture have been comparatively simple compared with the difficulties encountered in consolidating many of the small single-unit farms into more efficient producing units.

Future changes in number and size of farms in the South will increasingly involve ownership aspects. With only a quarter million cropper units classed as commercial farms, further reductions will not be as large a factor in the future as it has been in the past.

Trends in Size of Acreage by Economic Class

Changes in the distribution of land in farms have an important bearing on the size structure of farming. Acreage of land is a traditional measure of farm size that is based on what is perhaps the chief single physical input in farming. In contrast, the size groupings of farms

made in the study reported here are based on the value of farm sales, which is a measure of output. As such, it is a product that results from the use of all inputs of farming, including land.

Changes in the average acreage in farms are followed closely by those interested in farming. Farm acreage is the only measure of size that dates back to the earliest censuses. Number of acres is the standard unit for measuring land area, for comparing sizes of crop enterprises, and for measuring yields. As the total supply of land is relatively fixed, number of acres is a means of appraising the distribution of a limited natural resource. Much of the interest in size of acreage is probably traditional, in that it dates from earlier years when land was the major source of agricultural wealth. Farming techniques were simple and farm size could be measured fairly accurately in terms of so much land and labor.

Because of the general interest in farm acreage as a major resource and, also, because of the need to show the relationship of acreage to value groups of farms, the trends in average acreage by economic class are shown in table 14.

Commercial farms, as a group, were half again as large in 1954 as in 1940. This trend toward increasing size does not show up by individual classes of commercial farms, however. Within each class of farms, except for class I farms, the average acreage remained virtually unchanged between 1940 and 1954. Class I farms (those that grossed $25,000 or more) decreased in size of acreage by about a third.

In order to understand the changes that have taken place in farm acreage by economic class, one must keep in mind the tremendous shift in farm numbers. There were more farms in the larger economic classes in 1954 than in 1940 and fewer in the smaller classes. The fact that class I farms have declined in average acreage can be attributed to the increase in production from smaller acreage units, which boosted farm sales above the $25,000 figure. This does not mean that class I farm operators have reduced their acreages. It means that in recent years an increasing number of smaller acreage units have been included in the class I category.

The data in table 14 are useful in showing the acreages associated with farms grouped according to the value of gross sales. Use of the data for other than descriptive purposes, however, could lead to unwarranted assumptions regarding the relationships between classes of farms and between the different years.

Table 14. - Average acreage per farm, by economic class, United States, specified years, 1940-54 1/

Economic class 2/	1940	1945	1950	1954
	Acres	Acres	Acres	Acres
Commercial farms:				
Class I	2,900	2,480	2,422	1,939
Class II	536	585	567	538
Class III	292	299	298	312
Class IV	189	184	191	201
Class V	118	112	131	133
Class VI	90	89	85	97
All commercial farms	220	255	300	336
Noncommercial farms	80	74	65	71
All census farms	174	195	215	242

1/ Estimates based on reports of the Census of Agriculture (18).
2/ For definition, see table 4, page 19.

The larger average acreages, relative to gross sales, on the smaller economic classes of farms come about, to some extent, because the classification is based on farm sales in a given year rather than on normal or average sales. Farms with higher or lower than normal yields or sales from livestock inventories in a given year tend to be classified in higher or lower than normal sales groups, even though acreage and other farm inputs remain unchanged. This is a limitation of the economic classification discussed early in this report. The net effect is to exaggerate the acreages of farms in the smaller classes and to minimize the acreages of those in the larger classes.

The similarity in the average acreages of the different economic classes of farms in different years is coincidental to a large degree. Over the time period under consideration, the volume of farm sales per acre increased by a third. The average acreage per commercial farm increased also by 50 percent. The increase in acreage plus the increase in production per acre adds to an increase of approximately four-fifths in average sales per commercial farm. A substantial shift of farms into larger economic classes took place from 1940 to 1954.

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Farms shifted into large economic classes on the basis of the sum of the increase in efficiency (output per acre) and in acreage. The average farm increased its volume of sales by about 80 percent and was classified accordingly.

As mentioned previously, when grouped on the basis of gross sales, the larger farms show progressively higher average sales per acre. The rate of this apparent increase in efficiency associated with increasing gross sales is at about the same rate as the average increase in efficiency of farms that shifted upward in the classification. Because of this statistical coincidence, farms that shifted into larger economic classes averaged almost the identical acreage averaged by the farms in the classes into which they shifted.

THE RELATIVE SCALE OF FARM OPERATIONS

The volume of business has increased substantially on farms in recent years. There were nearly three times as many farms with sales of $25,000 or more (both calculated at 1954 prices) in 1954 as in 1930. Also, there has been an increase in the size of farms, as measured in acreage. Farms of 1,000 acres and over increased in number from 81,000 in 1930 to 121,000 in 1954. This apparent growth in farm size, coupled with the rapid decrease in the number of farms, has been a chief cause for concern over the status of the family farm in recent decades. What do these trends portend? Are family farms giving way to large-scale enterprises that depend primarily on hired labor for their operation? Is the farm family losing its identity as the dominant production unit in agriculture? These questions are basic considerations in public policy as it affects agriculture.

Analyses of recent changes in the size structure of farming have resulted in conflicting conclusions. This has been due partly to differences in concepts and definitions. In itself, the term "family farm" represents a somewhat intangible concept that has defied definition in purely material terms. But misunderstanding has resulted also from the multiplicity of usages of the term "farm size" and from the failure of many persons to recognize the inadequacy of traditional census size classifications to measure comparative sizes of farms in different time periods.

The Meaning of Farm Size

Farm size is a familiar term and one that, on the surface, might appear to need no explanation. Few terms, however, are used more frequently in farm economics with greater ambiguity. This is not due so much to misunderstanding of the term as to the various ways in which it is used.

The general use of farm size is in reference to classification - the separation of farms into size groups for relative comparison. The criteria used in classification depend both on the purposes for which comparisons are desired and on the availability of pertinent data to form a basis for classification. Frequently, the purpose of making a size grouping of farms is to describe the distribution of a particular farm resource or to measure differences in the efficiency with which particular resources are used at a given place and time. For example, farms may be grouped by number of acres for the purpose of describing the distribution of land among farms. The groupings of farms by size of acreage in publications growing out of the census of agriculture fall in this category. Also, groupings of farms on the basis of acreage might be made primarily for the purpose of holding acreage constant in order to measure the efficiency with which other farm resources are used in relation to land. These are restricted uses of size; they have validity and meaning only in respect to the specific purpose for which the groupings were made.

A more general use of the term farm size, and one that has particular relevance to the overall structure of farming, is to denote the relative control over all resources of production exercised by groups of farms. This measure of size relates to the bundle of productive factors - the quality, quantity, and combination - that go to make up a management unit. It has reference to the tangible physical resource services, which are usually referred to as land, labor, and capital, and to the less tangible factor of management that determines their use and composition at any given time.

Although control of the resources of production as defined might represent an ideal measure of size, its use has seldom been realized in practice. This is because of the obvious difficulty in obtaining the many nonadditive material and intangible values, as well as the virtual impossibility of compiling them into one measure. Instead, the general indicators of control over resources of production have been used. A wide variety of physical characteristics of the farm plant are available as a means of delineating size groups. Among those commonly used are total acres of land or land in specific crops, livestock numbers, value of capital investment, and number of workers employed. An additional popular criterion for measuring size is the value of market sales. This latter criterion is our basis for the economic classification of farms currently used by the Bureau of the Census. It is a measure of farm output rather than the input of labor, land, and other capital resources.

Each indicator of size has its merits, and use of one or the other is influenced by both the purpose and scope of the comparison of size,

as well as by the availability of data. Value of sales is used here for three reasons: (1) In dealing with aggregative data pertaining to farms of different types and different parts of the country, farm sales represent the best readily available common denominator for measuring the different kinds and qualities of resources. (2) As the total of farm sales is a result of all production inputs, it is believed that farm sales provide a better measure of the extent of resources controlled than does any single input. (3) Farm sales - a numerical value - may be adjusted by use of available indexes to take account of changes in the nature of inputs. This is an essential factor in defining relative size through time.

Farm Size as a Relative Measure

It is generally accepted that comparisons of size are relative. For example, acreage of land as an indicator of size is relative to climatic and geographic consideration. Capital investment is relative to the kinds of capital represented. Value of farm sales as a measure of size is relative to cost-price changes and the widely varying input-output relationships of different types of farms. Although relative factors are usually considered, in comparisons of size at a given time, the general tendency has been to ignore relativity in comparisons between different time periods. Farm size is relative in both place and time. Extension of the time dimension to farm size is not merely an abstraction; it is a necessity for comparisons of relative size in different years. In simple form, it is recognition of the technological innovations that have increased man's control over other resources of production and of the extent to which these improved techniques in farming have periodically enabled new factor combinations to produce an increased product.

Improved techniques in farming, if adopted uniformly over the years by all farms, would not alter any farm's relative share of control over the resources of production, that is, its relative size. Obviously, this has not been the case with agriculture. Different rates of progress have been characteristic in the invention of new techniques as well as in their adoption. Traditional concepts of size when applied for the purpose of comparing farm size in different years inevitably compare these growth differentials instead. In a dynamic and expanding economy, technological progress is normal. During a period when the total farm output has increased by more than a third, growth in physical production per farm is to be expected. Likewise, during a period when mechanical power and equipment have endowed man with expanded control over other resources of production, particularly land, increases in size of acreage are normal. In examination and analysis of changes in the

size structure of farming, the question is not whether there has been an actual increase in the physical production of, or the number of acres in, individual farms, but to what degree these increases have been more or less consistent with the technological progress enjoyed by agriculture in general (1). In a sense, this is a matter of holding the factor of technology constant statistically.

The question of size of operation, as it relates to family farms, has been associated closely with the work capacity of operator families. What is thought of as a family-size farm is usually an operation for which most of the labor needs, except for some peak seasonal operation, can be met by the operator and members of his family. The line of demarcation between what is a family-size operation and what is thought of as larger than family size, although not specific, is some point at which hired labor becomes a more essential element of the day-to-day operations than the family work force.

At the level of the individual farm, this concept is fairly easy to visualize. It is apparent, also, that the concept is relative through time to the productive capacity of the prevailing size of the family work force. If a farm business carried on predominately by family labor increased its volume of sales on the same acreage through the use of commercial fertilizers and other improved practices, most persons would agree that it remained a family farm regardless of the volume of sales. A farm that increased its market sales by reorganization toward a more intensive use of land or toward a more specialized type of operation, if still centered around the work capacity of family members, would similarly be conceded to be a family farm. Is it not true also that an increase in the acreage under operation, if handled by the operator and members of his family by virtue of the greater capacity for work afforded through mechanization, does not violate the concept of a family farm?

Trends in Farm Labor

Total farm employment in the United States decreased from 11.3 million in 1929 to 8.5 million in 1954, a decrease of 25 percent (table 15). The number of hired workers decreased at the more rapid rate of 35 percent during the same period. Between 1929 and 1944, the decrease in hired labor was at a greater rate than the decrease in family labor, but between 1944 and 1954, the two decreased at about the same rate.

The decrease in family labor has been at about the same rate as the decline in total farm numbers. The number of hired workers has decreased

Table 15. - Farm employment: Average number of persons employed and indexes, United States, specified years, 1929-54 1/

Year	Average number of persons			Index, 1929=100		
	Total employment	Family workers 2/	Hired workers 3/	Total employment	Family workers 2/	Hired workers 3/
	Thou.	Thou.	Thou.			
1929	11,282	8,302	2,980	100	100	100
1939	11,338	8,611	2,727	100	104	92
1944	10,219	7,988	2,231	91	96	75
1949	9,964	7,712	2,252	88	93	76
1954	8,451	6,521	1,930	75	79	65

1/ Simple averages of monthly employment during the last full calendar week ending at least 1 day before the end of the month.

2/ Includes farm operators doing 1 hour or more of farmwork and members of their families working 15 hours or more during the survey week without cash wages.

3/ Includes all persons doing 1 hour or more of farmwork during the survey week for pay.

Farm Labor (12).

at a somewhat faster rate than total farm numbers (table 16). As practically all of the hired workers are employed on commercial farms, the number of hired workers in each year was divided by the number of commercial farms. When expressed as the number of hired workers per commercial farm, there was little change between 1929 and 1954.

Census data on the expenditure for hired labor, when adjusted for differences in wage rates, indicate that the amount spent per commercial farm did not change substantially between 1939 and 1954 (table 17). The average of $700 to $800 per commercial farm represents about half a man-year of farmwork, or slightly more, at prevailing farm wage rates. This substantiates to some extent the data on number of hired workers per commercial farm shown in table 16.

Table 16. - Average number of hired workers per farm, United States, specified years, 1929-54 1/

Item	1929	1939	1944	1949	1954
Average per census farm	0.47	0.45	0.38	0.42	0.40
Average per commercial farm	.63	.64	.57	.65	.62

1/ The number of hired workers from table 16 divided by the number of farms appearing in table 4, page 19.

Table 17.- Average expenditures for hired labor and percentage distribution, commercial and noncommercial farms, United States, specified years, 1939-54

Economic class	1939	1944	1949	1954
	Dollars	Dollars	Dollars	Dollars
Average expenditure per farm: 1/				
Commercial farms 2/	700	715	795	715
Noncommercial farms 2/	84	82	51	38
All farms	512	503	528	477
	Percent	Percent	Percent	Percent
Percentage of expenditure:				
Commercial farms 2/	95.5	95.2	96.6	97.2
Noncommercial farms 2/	4.5	4.8	3.4	2.8
All farms	100.0	100.0	100.0	100.0

1/ In terms of 1954 wage rates. Estimates from appendix table 29 were deflated by an index of composite wage rates published currently in Farm Labor (12). The index numbers based on 1954=100, are as follows: 1949-85, 1944-65, 1939-25. Index numbers for 1939 and 1944 are not directly comparable with earlier years because of a revision in the procedure for estimating wage rates.

2/ See table 4, page 19, for definition.

Although the amount of hired labor used per commercial farm did not change significantly between 1939 and 1954, this is not true for commercial farms grouped by physical volume of farm sales (table 18). On each class of commercial farms, the expenditure for hired labor decreased by about half between 1939 and 1954, when expressed in terms of 1954 wage rates. (Current wages by economic class are shown in appendix table 29.) This means that commercial farm operators in each economic class were using only about half as much hired labor to produce a unit of farm production in 1954 as 15 years earlier. It means, also, that the average farm in each economic class depended less on hired labor and was geared more closely to the labor furnished by the farm operator and members of his family.

Table 18. - Average cash expenditure for hired labor per farm in terms of 1954 wage rates, economic classes of commercial farms, United States, specified years, 1939-54 1/

Economic class 2/	1939	1944	1949	1954
	Dollars	Dollars	Dollars	Dollars
Class I	16,520	11,660	10,765	8,300
Class II	2,760	2,040	1,865	1,166
Class III	1,000	715	655	422
Class IV	430	340	300	214
Class V	170	140	140	106
Class VI	80	80	54	43
All commercial farms	700	715	795	715

1/ In terms of 1954 wage rates. See footnote 1, table 17, page 45.
2/ See table 4 for definition of economic class.

A Measure of Relative Size

The family farm concept is fairly easily viewed in perspective from the level of the individual farm, but this is not true at the aggregative level. Groupings of farms made on the basis of specific resource characteristics or distributed according to value of output give an impression of homogeneity in resource use that tends to obscure both individuality and change. Although the number of farms with volume of physical output valued at $25,000 (1954 prices) more than doubled between 1939 and 1954, it is apparent that somewhat different resources are represented. In terms of both acreage and number of workers employed, farms that grossed $25,000 were smaller in 1949 and 1954 than in 1939. The average acreage decreased from 2,900 acres in 1939 to 1,939 acres in 1954. When adjusted for differences in wage rates, the average wage bill decreased from $16,500 in 1939 to $8,300 in 1954. This represented a decline of almost half in the average number of hired workers per farm.

In using the traditional census classification of farms to measure trends in family-size farms in contrast to large-scale enterprises, the major difficulty lies in adapting a concept oriented around the individual farm for use in classifying farms in the aggregate. At the level of the individual farm, the measure of the family-size farm is applied by redefining the upper limit of family-size operations consistent with increases in the productive work capacity of the farm family labor force. It is believed that an index of productive capacity may be used to separate the broad group of family farms from those that are family size.

Increases in the productive work capacity of farm labor may be summed up as (1) those that served to increase the market sales of farmers and (2) those that resulted from the increased work capacity arising from mechanization of farm operations. Two series of data are available to reduce these to numerical terms. The former may be expressed by changes in farm output; the latter by changes in farmwork requirements in man-hours. Dividing the former series by the latter gives a composite series of farm output per man-hour of labor which is expressed as an index. (See table 7, page 23.) This index provides a basis for viewing productive capacity in perspective. It may be thought of as an index of technological growth that can serve as a common denominator for redefining the concept of the family farm over time. It is used here as a device for deflating the value of market output on family farms to levels of business volume that are consistent with the increase in the productive capacity of the farm family.

The index of output per man-hour of labor is an indicator of the actual or realized increase in productive capacity of farm labor for the

country as a whole. It is an average for all farmworkers. Use of farm output per man-hour of labor as the indicator assumes that the changes in man's control over resources have been general throughout the United States. Admittedly, this is not entirely true, but it is believed to be true enough to measure the general direction and extent of these damages.

Operators of the larger farms have generally been much more up to date in adopting new techniques than the average of all farm operators. The time lag between invention and utilization has tended to be fairly short on the larger farms. Also, new techniques and machinery have varied in their adaptability to production conditions on different types of farms and in different geographic environments. In general, this has worked to the advantage of operators of farms that are characteristically larger in size and of regions of the country in which larger sizes prevail. The increase in labor productivity on tobacco farms, for example, where machinery has not been forthcoming to mechanize completely the peak labor needs, has been less than the increase on wheat farms. Also, although most regions and types of farms have benefited by improved varieties of seeds, few can equal the increase in productivity realized from use of hybrid seed corn, which has taken place primarily in the Corn Belt.

To this extent, use of an index of the average increase in output per man-hour of labor would appear not to allow for sufficient growth on the larger operations. However, there are compensating factors. Much of the increase in labor productivity in recent years resulted from a catching-up process, as changing conditions, financial and otherwise, enabled many operators of smaller farms to share more fully in the benefits of new techniques. In contrast, increases in production on the larger farms have probably tended to be geared to horizons of research and invention.

In the selection of base points for computing the trend in the number of family farms, some subjective considerations are involved. In order to define the size limits of the family farm through time relative to the productive capacity of labor, it was necessary to select in the base year a size that might be thought of generally as representing these limits. As the 1954 census economic classification of farms is used here as a base point, the upper limit of family farms is set, for purposes of this computation, at $25,000 gross sales in 1954. This is the breaking point between class I and class II farms in the 1954 census economic classification. Selection of this upper limit is a convenience. Admittedly, it is somewhat arbitrary.

Defining the upper size limit of the family farm more precisely in terms of gross sales would necessitate much detail and would obviously cover a fairly wide range of values that vary with production characteristics. Many farms with sales of $25,000 or more would be considered family operations. For example, livestock-feeding, dairy, and poultry farms with gross sales of more than $25,000 may be thought of as family size. These farms use large quantities of purchased inputs relative to labor. In some other types of farming in which fewer purchased inputs are used in relation to the labor employed, farms with sales of $25,000 are thought of as fairly sizable operations.

Use of the $2,500 sales figure in 1954 as the lower limit represents an attempt to separate the farms that are smaller than those usually considered adequate to provide productive employment for operator families. These may be thought of as smaller than a 1-man unit when account is taken of current levels of farm technology. Selection to define low-production commercial farms of this value limit is also based on recent publications of the United States Department of Agriculture (7, 19).

As an average for the United States, it is believed that $2,500 to $25,000 gross sales in 1954 are fairly realistic limits for approximating what might be thought of as a family-size farm. But even so, the major purpose of these computations is to show trends rather than precise number of farms in a particular year. The objective is to show the direction of changes in farm size and how this has affected the overall size structure. For this purpose, defining the exact sales limit for family farms in the base year (even if this were possible) is less important than redefining the concept in relative perspective in the years for which comparisons are made.

In applying this concept of the relative scale of farm operations to earlier years, the value limits for 1954 were adjusted to reflect changes in farm output per man-hour of labor, as well as changes in levels of prices received by farmers for farm commodities. The numbers of farms in relative size groups were determined by interpolation within the economic classes of commercial farms established earlier in this report. A more detailed explanation of the procedure is given in the appendix.

Large-Scale, Family-Scale, and Small-Scale Farms

According to the definition of size developed in the foregoing discussion, the trends in the relative scale of commercial farming operations are indicated in table 19. Large-scale farms are fewer in number now

Table 19. - Number and percentage of commercial farms in major size categories equivalent to constant levels of farm output per man-hour of labor, United States, specified years, 1930-54

Scale of operation 1/	1930	1940	1945	1950	1954
	Thou.	Thou.	Thou.	Thou.	Thou.
Number of commercial farms:					
Large-scale farms	205	195	175	155	134
Family farms:					
Family-scale	3,118	2,680	2,516	2,180	1,968
Small-scale	1,400	1,390	1,250	1,130	998
All family farms	4,518	4,070	3,766	3,310	2,966
All commercial farms	4,723	4,265	3,941	3,465	3,100
	Pct.	Pct.	Pct.	Pct.	Pct.
Percentage of commercial farms:					
Large-scale farms	4.3	4.6	4.4	4.5	4.3
Family farms:					
Family-scale	66.0	62.8	63.9	62.9	63.5
Small-scale	29.7	32.6	31.7	32.6	32.2
All family farms	95.7	95.4	95.6	95.5	95.7
All commercial farms	100.0	100.0	100.0	100.0	100.0

1/ The value of sales limits used in classifying farms by scale of operation in 1954 were as follows: Large-scale farms - $25,000; family-scale farms - $2,500 to $24,999; small-scale farms - $250 to $2,499. The value of sales limits for earlier years were deflated to reflect changes in prices received by farmers and changes in farm output per man-hour of labor. Numbers of farms in equivalent scale-of-operation groups were obtained by interpolation made from the census classification of farms by value of farm sales and total value of farm production. See the appendix for a more detailed description.

than they have been at any time in the last quarter century. The decline has proceeded at a fairly steady rate of about 20,000 farms in each 5-year period since 1940. Even though they are fewer in number, large-scale farms account for about the same proportion of commercial farms

now as 25 years ago (fig. 4). The number of family-scale operations has decreased by more than a million. These farms account for a slightly smaller proportion of the farms now than in 1930. The proportion of these farms to all commercial farms decreased from 66 to 64 percent. Small-scale operations, even though their number has declined, now account for a slightly higher proportion of all commercial farms. These small operations, which numbered nearly 1 million in 1954, accounted for a third of all commercial farms.

In explaining these trends, it must be recalled that the concept of scale (size of business) used here centers on the productive capacity of the farm family labor force. Large-scale farms are those with a size of output larger than would ordinarily be handled by an able-bodied farm operator and members of his family, when account is taken of the relative productivity of labor in the different years. Small-scale farms refer to operations that under these conditions would be too small in volume of business to employ productively a full-time able-bodied operator. In the relative concept of size used here, growth in volume of business is taken to be normal during a period of technological progress. Failure to progress is to regress in terms of relative size. The reader should bear in mind that the procedure for making these estimates resulted in setting up different value intervals in each year; and therefore, that changes in number include substantial shifting between size categories. They do not necessarily indicate entrance into or exit from agriculture of farms in any particular group.

Many farms which in earlier years would be thought of as large-scale on the basis of labor requirements are now no more than large family-size units that employ family labor predominantly in mechanized operations. In other words, many of the former large-scale units in commercial agriculture have not increased their volume of business to the full extent of labor's increased capacity to produce. Substantial shifting also took place between the family-scale and small-scale categories of farms. Some farms that would have been considered small-scale in earlier years probably increased the scope of their farming operations enough to move into the family-scale category. Some of the family-scale farms, at least the smaller ones, shifted into the small-scale category if they did not increase their volumes of business commensurately with the overall gains in productivity of labor. Most of the movement of farm units from commercial agriculture probably occurred among the family-scale and small-scale farms. Some units were consolidated with other farms. Other units became part-time and residential units.

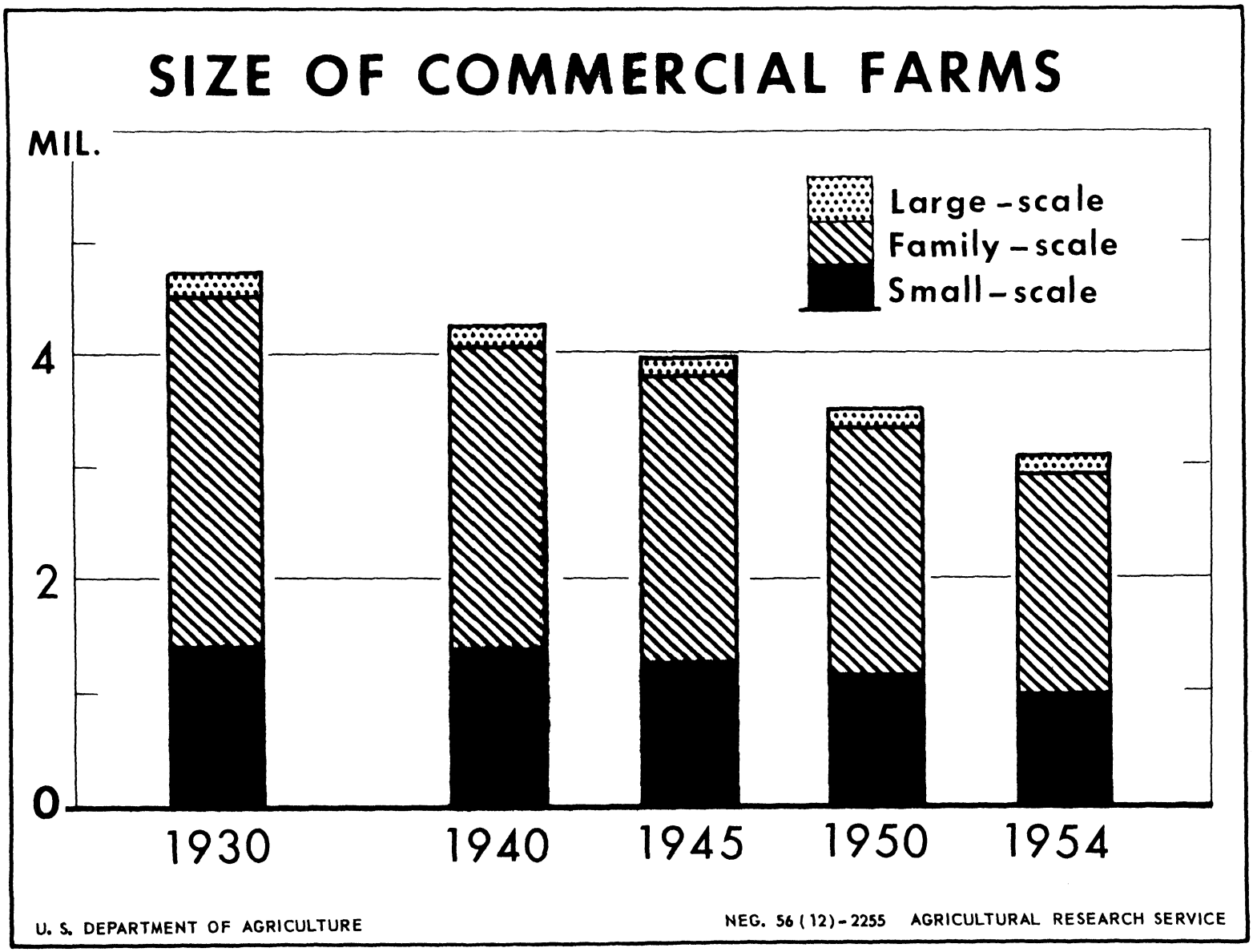
SIZE OF COMMERCIAL FARMS
MIL.
4
2
0
Large - scale
Family - scale
Small - scale
1930
1940
1945
1950
1954
U. S. DEPARTMENT OF AGRICULTURE
NEG. 56 (12) - 2255 AGRICULTURAL RESEARCH SERVICE

Figure 4

An additional indication of the relative importance of the different size categories is found in the proportions of farm sales that originate from these groups (table 20). Again, the most striking feature is the similarity between years. In each year, large-scale farms accounted for approximately a third, family-scale operations for roughly three-fifths, and small-scale units for about 6 percent of the market sales. Within this general similarity in the distribution of market sales since 1929, however, two directions are noticeable. Between 1929 and 1939, large-scale farms increased their share of the farm sales from 30 to 35 percent. 4/ During the same decade, the proportion of sales that originated from family-scale farms decreased from 64 to 59 percent. Since 1939, the direction has been reversed. The proportion of production from large-scale farms decreased from 35 to 31 percent while that of family-scale operations increased from 59 to 63 percent.

The substantial increase in volume of business that has taken place among these size categories is shown in the average value of sales per farm (physical production for each census year valued at 1954 prices for farm products). On commercial farms as a group, the physical output has more than doubled since 1929. Rates of growth have varied by size groups. On large-scale farms, growth has proceeded steadily since 1929. The volume of business of these farms increased 2 1/3 times in the 25 years that ended in 1954. The family-scale farms have averaged a slightly smaller increase in growth since 1929. Average sales of these farms in 1954 were about 2 1/5 times those of 1929. But since 1939, growth in volume of business has been more rapid on the family-scale farms.

These averages show the wide range in size of business that characterizes American agriculture. The average large-scale farm had a business volume in 1954 that was more than 40 times that of the average small-scale farm. The last quarter century has seen an increasing disparity in size of output between our largest and smallest commercial farms. But, except for the reverses suffered in the depression years of the 1930's, family-scale operations have narrowed this differential slightly.

Some indication of the importance of land as an element of growth in volume of business is found in the distribution of land among the three size categories (table 21). Large-scale farms accounted for a slightly

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4/ Changes in output between 1929 and 1939 cannot be determined precisely because the census of 1930 did not compile total sales on a comparable basis with later censuses. See the Appendix for a discussion of these differences and the procedure used to estimate farm sales by value groups for 1929.

Table 20. - Average sales per farm and proportion of sales by scale-of-operation groups, United States, specified years, 1929-54

Scale of operation 1/	1929	1939	1944	1949	1954
	Dollars	Dollars	Dollars	Dollars	Dollars
Average sales per farm: 2/					
Large-scale farms	23,700	30,300	38,200	44,700	56,200
Family farms:					
Family-scale farms	3,300	3,600	4,700	6,000	7,300
Small-scale farms	700	800	950	1,000	1,300
All commercial farms	3,400	4,000	5,100	6,100	7,500
	Percent	Percent	Percent	Percent	Percent
Percentage of sales: 2/					
Large-scale farms	30	35	34	33	31
Family farms:					
Family-scale farms	64	59	60	61	63
Small-scale farms	6	6	6	6	6
All commercial farms	100	100	100	100	100

1/ For definition of groups, see footnote 1, table 19, page 50.
2/ Physical production in earlier years converted to 1954 level of prices received by farmers.

smaller proportion of the land in farms in 1954 (29 percent) than they accounted for 15 years earlier. Family-scale farms increased their proportion of land during this period from 57 to 63 percent. A decrease from 14 to 11 percent is indicated for small-scale farms. In terms of average acreage per farm, large-scale and family-scale operations have enlarged their acreages by about half. Small-scale farms have not changed significantly.

Thus, despite the decrease of a third in the total number of commercial farms, the proportion of farms in the relative size groups (large-scale, family-scale, and small-scale) has changed very little in the last 25 years. Although mechanization and related technology have not resulted in increases in large-scale operations, neither have they served to increase the size of business on many small-scale units in agriculture. The changes in proportional numbers that have occurred indicate that a quarter-century of technological progress has been associated with a slight

Table 21. - Average acreage in farms and proportion of land in farms, by scale-of-operation groups, United States, specified years, 1950-54

Scale of operation 1/	1940	1945	1950	1954
	Acres	Acres	Acres	Acres
Average acreage per farm:				
Large-scale farms	1,350	1,695	1,870	1,939
Family-scale farms	200	235	275	318
Small-scale farms	95	94	97	116
All commercial farms	220	255	300	336
	Percent	Percent	Percent	Percent
Percentage of land in farms:				
Large-scale farms	29	30	29	26
Family-scale farms	57	59	60	63
Small-scale farms	14	11	11	11
All commercial farms	100	100	100	100

1/ For definition of groups, see footnote 1, table 19, page 50.

increase in the proportion of farms that are smaller than "1-man units."

Family-scale operations have declined both in total numbers and as a proportion of commercial farms. Between 1929 and 1939, family-scale farms accounted for a declining proportion of market sales and a corresponding increase is indicated for large-scale farms. Since 1939, however, the volume of business on family-scale farms has more than doubled, and these farms have accounted for an increasing proportion of the market sales from commercial farms. Also, a slightly higher proportion of the land in farms was in family-scale farms in 1954 than in 1940. Since 1940, it appears that these farms have had a somewhat greater rate of growth than large-scale farms in terms of market sales as well as size of acreage.

The Nature of the Increase in Volume of Business

Explanation of these trends is largely that of interpreting the processes by which farmers have increased their volume of business. This increase in volume of business on farms in recent years, although it

was related to economic growth and expansion of the economy generally, resulted from the many technological improvements that have been made in farm production practices. These improvements, as they have affected farm size, are (1) those that brought about higher yields per crop acre and per head of food livestock, and (2) those that served to decrease labor needs.

The former group of technological improvements relate to the increase in production from existing acreage that resulted from such things as using more commercial fertilizers, higher yielding varieties of seed, and improved strains of livestock. These improvements are frequently referred to as improved simple techniques, as they do not involve large capital expenditures or changes in the relation between enterprises.

The latter group of improvements deal with the mechanization of farming that enabled a larger output to be tended and harvested with fewer workers. Mechanization was frequently accompanied by substantial reorganization of the farming system. Use of mechanical power and equipment probably had no appreciable effect on yield (except that attributed to greater timeliness in performing crucial tasks) but the resulting decrease in labor needs had a far-reaching effect on the size structure of farms.

Changes in the size structure of farming are closely related to the complex techniques that revolve around the mechanization of farm operations but that vary considerably in their applicability to different types and sizes of farms, topographic conditions, and financial situations of individual farm families. Much of the current concern about the family farm stems from an awareness that increased mechanization of farm operations tends to induce larger operating units.

Under the concept of relative size used here, apprehensions concerning the shifts toward large-scale operations in which hired labor is employed in agriculture have not been borne out. Although this matter needs further study by areas and types of farms, the data contained in this report indicate that apparently family farms are holding their own. Despite the apparent tendency toward increasing the size of farms, the number of large-scale farms has decreased by a third, as measured in table 19. The 15 years (1939-54) have seen a slight decline in the proportion of production as well as in the acreage of land controlled by these larger-than-family-size operations. This direction of adjustments may indicate the tempering effect of many factors that, both directly and indirectly, have influenced rate of growth. Within the peculiar nature of the production process in agriculture, it is likely that built-in social

and economic checks have worked to modify many of the so-called advantages of scale.

The advent of the tractor as a practical source of mobile mechanical power has not affected agriculture in the same way that power inventions a century or more earlier affected the manufacturing industries. The growth of the manufacturing industries and the concentrations of workers and tools of production into large management units were based on certain inherent efficiencies of large-scale operation, which apparently are not found to any great extent in agriculture (3). These efficiencies are (1) standardization, (2) division of labor, and (3) division of management. Standardization relates to simplification or routinization of techniques to turn out a product of specified quality. It implies exacting control and predictability throughout the production process. Division of labor refers to the breaking down of production into different and separate stages that may be carried on simultaneously. This permits workers to achieve the efficiency and skill that come from specializing in one or a few tasks. The division of management allows the supervisory function to be concentrated on a few given processes. This increases the capacity of management for supervision of a large number of workers engaged in similar tasks.

For the most part, these efficiencies have been nonexistent in agriculture. One complexity of management, and one that ordinarily has been a limiting factor in the size of farm operations, is the supervision of labor in a variety of different production processes. These processes are usually dispersed within as well as without the physical boundaries of the farm. Specific farm tasks vary with seasons as well as enterprises, and day-to-day modifications are the rule rather than the exception. Mechanization has not decreased the number of specific tasks, but it has combined some of them into fewer operations and has standardized to some extent the quality of work performed. Of greatest significance to management in agriculture, however, is the fact that mechanization has not increased its capacity for supervision of more farmworkers. Rather, it has decreased the need for farmworkers and thereby has enabled management to supervise more acres as well as to farm more intensively on existing acreage.

In general, mechanization in agriculture has been accompanied by one or more of the following: (1) Enlargement of the acreage base of the farm operation; (2) an increase in the intensity of production on existing acreages; and (3) a decrease in the amount of labor used in similar farming processes. Which of these took place, either singly or in combination, depended largely on the motivation from which mechanization proceeded.

On the larger units in commercial agriculture, as a rule, mechanization has more nearly kept pace with the rate of invention of new machinery. Operators of these farms, with their more favorable financial situation, have had greater freedom of choice in this respect. The motives involved were, for the most part, purely economic. As these operators depend mainly on hired labor to operate their farms, the rising farm wages that have resulted from the pull of nonfarm occupations stimulated their adoption of mechanical equipment as a substitute for scarce labor. Indications are that movements of labor from agriculture generally preceded the introduction of machinery on farms, in contrast to the theory that machinery displaced hired workers. In fact, the much earlier advent of mechanical equipment in the North and West than in the South was due partly to the expansion of resource-based industries that created a pull of persons from the farm at the same time that labor-saving machinery was becoming available to agriculture (5). To the extent that machinery was substituted for hired labor, mechanization probably did not affect the size of units to any great extent.

On these larger farms, the pressure for increasing the acreage under operation may have been less than on smaller farms. The operators of larger farms have had more flexibility than the small farmers in respect to size of machinery used as well as to number of workers employed. By and large, these farms are of a size to use the largest and latest machines efficiently. Their larger size has also afforded more complete divisibility of machine inputs and combinations of sizes to achieve maximum efficiency on existing acreages. An operator of a smaller farm, for example, may have to decide between using a small tractor and equipment that lacks the needed capacity for peak workloads or a larger tractor and related equipment that cannot be utilized at maximum efficiency on the acreage he operates. In respect to labor, large-scale farmers have had more leeway in adjusting labor inputs through reducing the number of hired workers. This greater flexibility in resource combinations no doubt made for easier and more complete adjustments on large-scale farms, without the necessity of changing the acreage base or reorganizing the farming system to use the land more intensively.

Operators of the larger farms generally have had greater financial ability to make profitable investments in land, buildings, and equipment. Higher disposable incomes to operators of these farms have provided investment funds as well as greater cash reserves. The more general use of regular commercial credit channels has provided additional funds when needed.

Part of the financial advantage of large-scale farms over the smaller units, however, probably lies in the differences in outlook of their operators. The larger operations are oriented more to a commercial environment and investments are made on a rational economic basis of the long-range expectations for earnings. Frequently, farmers on the smaller farms have not used even the more limited credit facilities available to them. Although this may be partly because of less informed management, it may result more from the smaller incomes received by these operators. Risk taking is easier when one is certain of adequate cash or credit reserves to tide over a few years of adverse prices or weather. Adverse conditions that might mean temporary losses to large-scale operators could easily result in bankruptcy and loss of farm, home, and occupation for operators of smaller farms.

During the decade from 1929 to 1939, large-scale farms increased their volumes of business substantially, and in 1939, they accounted for a greater proportion of market sales than in 1929 (table 20, page 54). It is apparent that even during the period of low prices for farm products and reduced incomes to farming, large-scale operators continued to apply the fruits of scientific advances in production techniques. Failure of smaller farmers to make similar investments to increase their volumes of business can probably be traced to their more limited financial and credit situations. Incomes were low and this was met by a virtual curtailment of investment for capital items and by holding current cash operating expenditures to a minimum.

Family farms are affected by many of the economic incentives for mechanization that affect the large-scale units. The slower adoption of mechanization on family farms, however, has been due largely to the more limited capital available to these farmers and the economic reality that mechanization, as such, can increase yields and incomes very little unless it is accompanied by either increases in the acreage handled or reorganized systems of farming. Operators of family farms, who are faced with a more or less fixed family-labor supply, lack a strong economic incentive to substitute machinery for labor.

Past trends indicate that family-size farms make their greatest investments for improvement in yields and decreases in labor needs in years of reasonably good returns to farming. These investments are probably made largely from current income. In a study of the savings and debt-paying abilities of a selected group of Georgia Piedmont farm families on family-size farms, Hendrix concluded that "incomes large enough to provide at the same time a reasonably good living are essential to either very modest savings or safe credit transactions" (4).

The increase in mechanization on family farms has been associated closely with the rise in disposable incomes of farm families, which began in the early forties. Indications are that motives were social as well as economic. Many farms that were operated primarily by family labor were mechanized to remove some of the human drudgery from farming - to shorten working hours and relieve wives and children from fieldwork. To family farmers, tractors and mechanical equipment have brought about an improvement in working conditions of family members similar to the improvements that electrical appliances and facilities have brought in levels of living in the household.

Mechanization of family farms, however, unless accompanied by a substantial decrease in the number of family members remaining at home, created a tremendous potential within the family for stepping up production through farm enlargement. This was because of the need to utilize family labor more efficiently and to justify, economically, the high cost of machinery. Much of the increase in size of acreage in recent years was probably of this nature, as the steady pull of people from farm to nonfarm occupations made land available for farm enlargement.

Under most conditions, enlargement of the acreage under one management operation is a slow process, which depends on whether land for rent or purchase is available within reasonable proximity to the farm headquarters. The rate at which land becomes available for farm consolidation at economically feasible prices is usually through the normal process of division of estates and bankruptcies and retirements, as well as the voluntary movement of whole families from farming to other occupations. Outmigration, in turn, depends on the availability of profitable alternatives to farming.

Nichols (9) has shown that in the South, for example, it is not at all uncommon to find heavy pressure on the local land supply by a population lacking alternative non-agricultural employment. When this occurs, the price of even very poor land is bid up to levels comparable to those of the Nation's most fertile lands.

Under these circumstances, the cost of land may virtually prohibit needed adjustments in acreage. But even availability of land for farm enlargement at economically feasible prices does not assure reorganization into effective mechanized units. Often the land is hilly, rough, and unsuited to mechanized operations in the types of farming carried on. Consolidations of small cotton and general farms in the southeastern and Appalachian regions into more efficient operating units have frequently required complex changes in enterprises. Under these conditions,

adjustments are more difficult, as they require new or different managerial skills as well as large investments in capital items.

Since 1939, the increase in volume of business on family-scale farms has been slightly more than was indicated for large-scale farms. Family-scale operations accounted for successively higher proportions of the market sales in each 5-year interval between 1939 and 1954. These gains were apparently the result of a phenomenal "catching-up" process as rising farm incomes stimulated the rapid assimilation on family-scale farms of a variety of production innovations whose adoption had been seriously retarded during the depression years of the 1930's. Growth and development in the nonfarm sector and high levels of employment and income created an economic environment that facilitated these adjustments in agriculture.

INCOME OF FARM OPERATOR FAMILIES

In an economy dedicated to steadily increasing levels of living, the problem of low incomes among large numbers of farm families is of concern. Low incomes are a chronic problem among operator families on many of the smaller commercial farms. It has been shown that these small farms have disappeared rapidly from American agriculture in recent years. Many of these operators enlarged the scope of their farming operations. Others improved their financial status by taking up nonfarm jobs. Some continued to farm on a part-time basis while others left the farm completely. Fewer farms have meant a larger resource base for those who have chosen to remain in agriculture. This has resulted in a substantial increase in size of farm when measured in terms of acreage and volume of business. These developments have worked toward a more efficient agriculture. At the same time, the fewer persons in farming have obtained a larger share of farm income per person.

Adjustments of this kind, however, are not necessarily reflected in actual improvement in the real incomes from farming of farm operator families. Net cash incomes from farming are comprised of the quantity of production marketed times the price per unit received minus the cash costs of production. Real cash incomes, in turn, depend on the relative purchasing power of the farmer's dollar for the goods and services used in family living.

The physical volume of farm marketings has increased steadily since 1929, except for years of adverse weather. In 1954, it was half again as large as it was 25 years earlier (table 22). Real incomes of farm

Table 22. - Cash receipts, expenditures, and net cash income from farming, United States, selected years, 1929-54

Year	Cash receipts from farm marketings 1/	Operators' cash expenditures 2/	Operators' net cash income from farming 3/	Cash receipts from farm marketings valued at 1954 prices 4/	Operators' real net cash income from farming (purchasing power in 1954 dollars) 5/
	Million dollars	Million dollars	Million dollars	Million dollars	Million dollars
1929	11,312	7,393	3,919	19,044	6,973
1939	7,872	5,994	2,641	20,607	6,030
1944	20,536	11,943	9,369	25,949	14,662
1949	27,864	19,540	8,510	27,753	9,594
1954	29,714	21,664	8,307	29,714	8,307

1/ All sales of crops, livestock, and livestock products.

2/ Includes current operating expenses, farm capital expenditures, property taxes, farm mortgage interest, and net rent to nonfarm landlords.

3/ Cash receipts less cash expenditures plus government payments.

4/ Cash receipts deflated to 1954 level of prices received by farmers for farm products.

5/ Operator's net cash income deflated to 1954 level of prices paid by farmers for family living items.

The Farm Income Situation (11).

families (from farming), however, have varied because of changes in price levels for farm products, the composition and cost of production items, and the cost of items used for family living.

Between 1929 and 1939, farm prices fell off substantially, while the cost of items bought by farmers for production and family living did not decline proportionately. In contrast to the 1929-39 period were the years 1939-44, during which prices for farm products more than doubled and costs of production and of family living rose more slowly. Farm prices continued to rise in the years immediately following World War II, but by 1949, rising costs to farmers for production items and for family living had reduced real incomes from farming to nearly a third below the peak years of 1943-47. In 1954, farm prices averaged about the same as in 1949, but the continuing increase in costs of production and of family living items brought about a further decline in the purchasing power of farm income. The average real net income per farm was only slightly less in 1954 than 5 years earlier because of the continuing decline in farm numbers.

Since 1929, the composition of production resources used in farming has changed considerably. The increases in total farm production are associated with increases in purchased inputs, such as fertilizers and seeds. Mechanization of farm operations entailed increased cash costs for upkeep and replacement of machines and for fuel and oil. The changing nature of farm inputs increased total farm output and output per unit of labor. But at the same time, it increased farmers' vulnerability to changes in the prices of goods and services produced in the nonfarm sector. The overall result is that relative to prices received, the cash costs associated with producing a given quantity of farm production have increased.

Low-Income Farms

A major aspect of the structural changes that have taken place in farming has to do with changes in the relative income groups in agriculture. The phenomenal increase in total farm output in recent years and the growth in average market sales on commercial farms do not reflect the relative income situation of farmers. The economic classification of commercial farms, discussed previously in this report, is intended primarily to show the rate of growth in farm size based on numbers of farms that were producing at specified volumes of physical output. Use of these classes in analyses of income changes in agriculture would be misleading. This is particularly true with reference to the small class V and class VI farms whose numbers have decreased so rapidly in recent

decades. In fact, the apparent decrease in the number of small, low-income farms could lead to a complacent attitude regarding this serious problem. It is not that the million farm operator families who in 1954 received their primary source of income from gross farm sales of less than $2,500 are likely to be taken as a minor problem; but that the decrease in the number of farms producing at this level of physical production creates a false impression that the low-income problem in agriculture is being rapidly cured through time (see table 5, page 20).

For the purpose of providing an approximate measure of the low-income farm problem in perspective over the last quarter-century, two concepts of income are taken into consideration: (1) Low income on a real income basis and (2) low income on a relative income basis. The former concept relates to the determination of low income on an absolute basis and deals with the establishment of the number of farm operator families with real incomes from farming that are below a constant value. The latter concept views low income as relative to incomes throughout the economy at large.

Farms in classes V and VI - those with farm sales of less than $2,500 - are taken to represent low-income farms in 1954. Operators of these farms did not work off the farm as much as 100 days, and farm sales exceeded the incomes of the operator families from off-farm sources. Low-income farms in the earlier years are related to the gross farm sales required, on the average, to realize incomes equivalent to those on class V and class VI farms in 1954.

In determining the number of low-income farms on a real income basis, it was necessary to establish for each year the gross farm sales that were required to return to the operator a constant real net cash income from farming. Account was taken of changes in prices received by farmers, changes in the composition and costs of farm production inputs, and changes in the cost of items purchased for family living. Interpolations were made of the number of farms having gross sales below this established amount. The groupings on this basis mean simply that if the classification of farms in 1954 by gross value of sales is used to designate low-income farms, comparable groupings on a real income basis for earlier years would be as indicated. For a more detailed explanation of procedure, see the appendix.

It is apparent that real incomes from farming, as measured in this way, have been subject to violent fluctuations during the last 25 years (table 23). The magnitude of this change is illustrated in the gross sales equivalent used to determine numbers of low-income farms on a

Table 23. - Low-income farms; gross sales equivalents and numbers of farms on two bases, United States, selected years, 1929-54

Year	Real income basis			Relative income basis		
		Low-income farms 2/			Low-income farms 2/	
	Gross sales equivalent 1/	Number	Percentage of commercial farms	Gross sales equivalent 3/	Number	Percentage of commercial farms
	1954 dollars	Thousands	Percent	1954 dollars	Thousands	Percent
1929	1,905	2,320	49.1	1,295	1,690	35.8
1939	2,390	2,290	53.7	1,585	1,670	39.2
1944	1,235	960	24.4	1,275	1,000	25.4
1949	2,020	1,140	32.9	1,830	1,050	30.3
1954	2,500	998	32.2	2,500	998	32.2

1/ Gross sales (valued at 1954 prices) required to return to farm operators a real net cash income from farming equivalent to that received from gross sales of $2,500 in 1954, when account is made for overall changes in the composition of farm inputs, price-cost relationships, and family living costs. See the appendix for a more detailed explanation.

2/ Number of commercial farms in each year having gross sales of less than the amounts specified in the adjacent gross sales equivalent column. See the appendix for a more detailed explanation.

3/ The gross sales equivalents of real income were adjusted by an index of United States average real income per capita. See the appendix for a more detailed explanation.

real income basis. In 1949 and 1954, it took nearly twice the volume of farm marketings (valued at 1954 prices) that it took in 1944 to produce a unit of real income. Between 1944 and 1954, a farmer needed to double his physical volume of market sales in order to maintain the same purchasing power.

The reader is cautioned that the several components that go into making these estimates are based on averages for the United States for all farms. Changes in the kind of inputs, the proportion of gross sales that is net, the prices farmers receive for farm commodities, and even the items purchased for family living vary considerably by types and sizes of farms. It is believed, however, that variations of individual farms from the average would introduce a generally similar bias in each of the years for which estimates are made. The approximations are perhaps more useful to indicate the direction of changes than to define absolute numbers in any given year.

On a real income basis, low-income farms comprised nearly half of the commercial farms in 1930. Despite the decrease of a half million in the number of commercial farms between 1930 and 1940, the number of low-income farms increased. The greatest improvement in the income position of farmers was in the 1940-45 period, when farm prices were high relative to costs and during which total production increased by about a fifth. The number of low-income farms declined by more than half to comprise only a fourth of the commercial farms. Between 1945 and 1950, low-income farms as indicated by this measure increased as a proportion of all commercial farms from a fourth to a third. The actual number of these farms increased between 1945 and 1950 and in 1954, the number was only slightly smaller than 10 years earlier.

What is happening to the number and proportion of farms that make up the low-income problem in commercial agriculture as defined by this measure depends largely on the time periods selected for comparison. Selection of an appropriate base for comparison would involve arbitrary determination of the price-cost relationships deemed equitable to producers and consumers of farm products alike. Use of 1945 for comparative purposes selects one of several World War II years in which price controls were in effect. Price ceilings for farm products were fixed at levels that were higher in relation to ceiling prices of commodities used in farm production and family living than is characteristic of these relationships during peacetime years. The economic pricing mechanism was favorable to farmers during the World War II years. If 1940, 1930, or possibly any earlier year is taken as a basis for comparison, it is apparent that there has been substantial improvement in the low-income farm problem.

As the base year is moved farther back into the past, however, another concept of income must be considered. Progress, over time, is based on increasing, not constant, incomes. Increasing levels of living are associated with a rise in the real incomes of families and individuals. The comparison shown here of the numbers of farms having constant purchasing power is not sufficient as a relative measure if it is extended over a prolonged period of years. The question of income in agriculture, as it relates to time, is whether the increase in farm incomes has been consistent with the rising incomes and levels of living of persons in other sectors of the economy.

It is looking toward this latter concept of what constitutes low income that estimates are made of the number of low-income farms on a relative income basis. The gross sales equivalents of real income, discussed previously, were deflated by an index of average per capita real income for the United States. Interpolations were made to determine the number of farms with sales below these adjusted amounts. The number of low-income farms on a relative income basis is also shown in table 23.

When low income in agriculture is viewed relative to incomes in other segments of the economy, it is apparent that the contours of the problem differ somewhat from those indicated by numbers of low-income farms on a real income basis. In a comparison of the two series of trend data, the most noticeable difference is that there were considerably fewer low-income farms in 1930 and 1940 on a relative income basis than was indicated by the measure based on real income (fig. 5). The proportions of the commercial farms that are low-income farms according to this concept of relative income show surprisingly small variation. Only a slightly smaller proportion of the commercial farms were classified as low-income farms in 1954 than 25 years earlier.

Relative to average real income per capita for the United States as a whole, the proportion of low-income commercial farms increased between 1945 and 1950 and between 1950 and 1954. However, the absolute number remained at approximately 1 million in each of those years.

NUMBER OF FARMS BY INCOME AND SCALE OF OPERATION

The foregoing discussions of changes in the farming structure were based on three approaches: (1) Changes in the number of farms in constant physical output groups; (2) changes in the number of commercial farms grouped by physical output levels associated with constant levels of employment through time; and (3) changes in the number of low-income commercial farms grouped by physical output levels associated with estimated net cash income from farming.

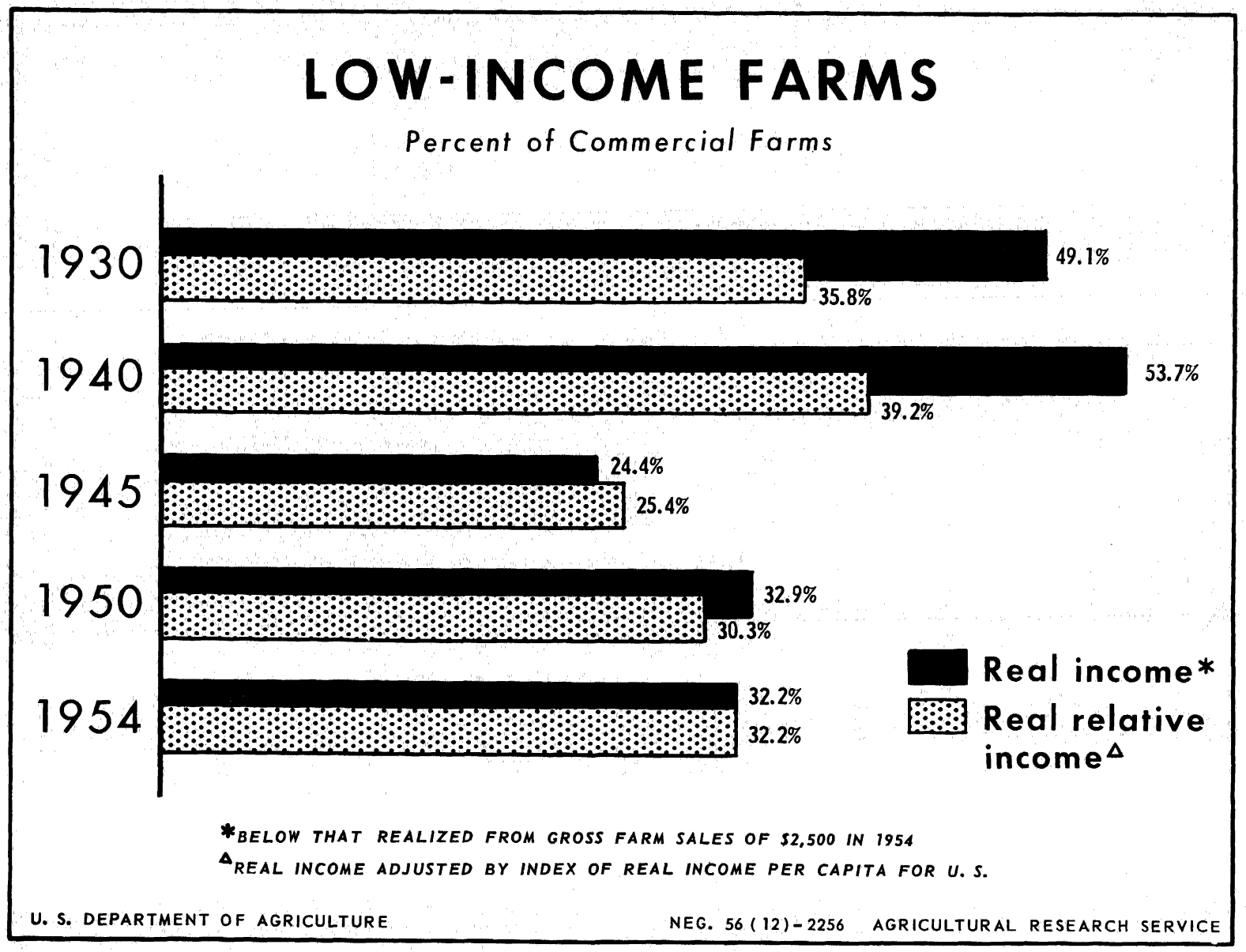
LOW-INCOME FARMS
Percent of Commercial Farms
1930
49.1%
35.8%
1940
53.7%
39.2%
1945
24.4%
25.4%
1950
32.9%
30.3%
1954
32.2%
32.2%
Real income*
Real relative income△
*BELOW THAT REALIZED FROM GROSS FARM SALES OF $2,500 IN 1954
△REAL INCOME ADJUSTED BY INDEX OF REAL INCOME PER CAPITA FOR U. S.
U. S. DEPARTMENT OF AGRICULTURE
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Figure 5

No attempt has been made to define what is frequently referred to as "the family farm ideal." It is believed, however, that most of the ingredients of a generally useful approximation of the goal are found within the concepts of scale of operation and income of operator families. Scale of operation is a measure of control over resources of production. The terms "large-scale," "family-scale," and "small-scale" are used in this report to define broad groups of farms which, throughout the years under consideration, represent similar levels of productive capacity of labor. Scale of operation, as applied to the family farm concept, has particular reference to the separation in each year of the farms that would be thought of as larger than family size - farms with a volume of business large enough so that hired labor is an important element in the day-to-day operations; farms that, even using current levels of technological efficiency, had productive work requirements in excess of those that ordinarily would be handled by the operator and members of his family with only supplementary use of hired labor.

Many social and cultural values commonly associated with the family farm "ideal" are difficult to define or measure quantitatively. Farm operator income levels are rather closely related to these goals. Housing, diet, education of children, home conveniences, and all the other indexes of levels of living depend in part on family income, as does the development of such community facilities as churches, schools, and roads. Associated closely are such things as security in old age and conservation and improvement of the land. The attainment of these goals also is related to the levels of income that farmers receive.

As used in this report, measures of income are oriented primarily toward defining trends in numbers of family farms on which incomes from farming would probably be too small to permit realization of these goals. Gross farm sales of $2,500 were taken to represent the minimum gross farm sales required, on the average, to provide a reasonably acceptable cash income from farming in 1954.

This level of income is arbitrary. As a matter of convenience, the breaking point between class IV and class V farms in the 1954 census economic classification is used. Cash income from farming on farms with $2,500 gross sales would range, perhaps, no higher than $1,500 to $2,000. The average would probably be considerably less. This cash income does not take into account the farm-produced products used in the home, the rental value of the farm dwelling, or other sources of nonmonetary income usually referred to as farm perquisites. Additional cash income to most of these families from off-farm sources is not large in view of criteria used in separating these farms. This supplemental income has probably increased through time, however. Classification

criteria for this group of commercial farms exclude those with a major source of employment or income from off-farm sources.

The measures of income and scale of operation have been merged to give some general indication of changes in the structure of farming when farms are viewed as large-scale farms, medium- to high-income family farms, and low-income family farms (fig. 6, table 24). The income-scale approach to approximating the trend in number of medium- to high-income farms consists of separating out the large-scale and the low-income farms. The level of real farm income relative to income in other segments of the economy is used to determine the number of low-income family farms. The residual approximates what might be thought of as medium- to high-income family farms.

These estimates are based on the concepts and procedures developed in foregoing discussions. They are subject to the limitations inherent in the application of these concepts to broad groupings of farms. The purpose of the estimates is primarily to show trend and direction. As such, the estimates of farm numbers are more useful in showing the comparative change between years than in indicating the actual number of farms in the different categories in any particular year.

By this measure, the number of family farms in commercial agriculture with medium-to-high incomes decreased by half a million between 1930 and 1940. In the depression years of the 1930's, the combination of low farm prices, fairly rigid costs for items of production and family living, and limited opportunities for farm-nonfarm migration reduced the proportion of medium- to high-income family farms, as defined, to the lowest ebb of the last 25 years. In contrast, World War II ushered in some of agriculture's most prosperous years. Family farms with medium-to-high incomes comprised more than two-thirds of all commercial farms in 1945.

Between 1945 and 1954, the number of these farms decreased by 800,000 and as a proportion of commercial farms, from 70 to 64 percent. Rising farm prices were more than offset by still higher costs of production. Real net cash farm-operator income dropped by more than two-fifths. As mentioned previously, the move toward part-time farming was particularly noticeable during this decade. No doubt, the move toward part-time farming was influenced somewhat by the price-cost squeeze in agriculture and the need to supplement reduced farm earnings.

It is apparent that the number and proportion of commercial farms that are medium- to high-income family farms according to the concepts and definitions used in this report have varied considerably through time. Scale of

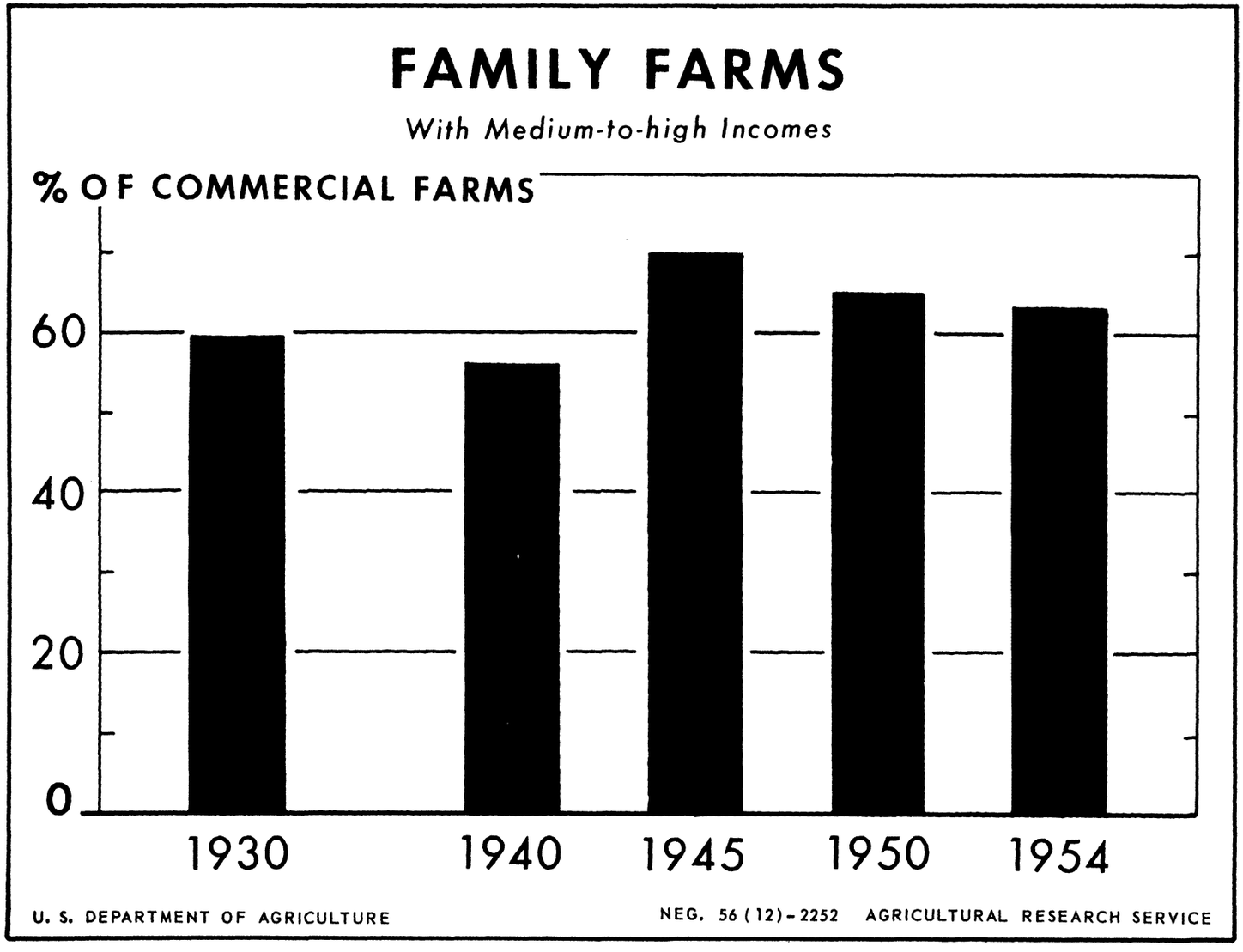
FAMILY FARMS
With Medium-to-high Incomes
% OF COMMERCIAL FARMS
60
40
20
0
1930
1940
1945
1950
1954
U. S. DEPARTMENT OF AGRICULTURE
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Figure 6

Table 24. - Number and percentage of large-scale commercial farms and number of family farms by income groups, United States, specified years, 1929-54

Income and scale-of-operation group	1930	1940	1945	1950	1954
	Thou.	Thou.	Thou.	Thou.	Thou.
Number of commercial farms:					
Large-scale farms 1/	205	195	175	155	134
Family farms: 1/					
Medium to high income 2/	2,828	2,400	2,766	2,260	1,968
Low income 3/	1,690	1,670	1,000	1,050	998
All family farms	4,518	4,070	3,766	3,310	2,966
All commercial farms	4,723	4,265	3,941	3,465	3,100
	Percent	Percent	Percent	Percent	Percent
Percentage of commercial farms:					
Large-scale farms 1/	4.3	4.6	4.4	4.5	4.3
Family farms: 1/					
Medium-to-high-income 2/	59.9	56.3	70.2	65.2	63.5
Low-income 3/	35.8	39.1	25.4	30.3	32.2
All family farms	95.7	95.4	95.6	95.5	95.7
All commercial farms	100.0	100.0	100.0	100.0	100.0

1/ For definition, see footnote 1, table 15, page 44.

2/ Obtained by subtracting the number of low-income farms from the number of all family farms.

3/ Relative income basis. For definition, see footnotes to table 19, page 50.

operation imposes an upper limit that has shown a fairly constant direction over the years, but use of the income concept reveals the extent to which external economic factors, over which farm families have little control, determine the number and proportion of medium- to high-income family farms. Prices for farm products, the relative cost to farmers of items used in farm production and for family living, and the availability of profitable job alternatives outside agriculture have an essential part in determining the number and importance of medium- to high-income family farms.

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APPENDIX

Table 25.- The labor force, United States, 1929-55

Year	Persons 14 years of age and over							
	Total	Total labor force (including Armed Forces)	Armed Forces	Civilian labor force				
				Total	Employment			Unemployment
					Total	Agricultural	Non-agricultural	
	Thou.	Thou.	Thou.	Thou.	Thou.	Thou.	Thou.	Thou.
1929	87,910	49,440	260	49,180	47,630	10,450	37,180	1,500
1930	89,440	50,080	260	49,820	45,480	10,340	35,140	4,340
1931	90,600	50,680	260	50,420	42,400	10,290	32,110	8,020
1932	91,700	51,250	250	51,000	38,940	10,170	28,770	12,060
1933	92,840	51,840	250	51,590	38,760	10,090	28,670	12,830
1934	94,080	52,490	260	52,230	40,890	9,900	30,990	11,340
1935	95,350	53,140	270	52,870	42,260	10,110	32,150	10,610
1936	96,580	53,740	300	53,440	44,410	10,000	34,410	9,030
1937	97,740	54,320	320	54,000	46,300	9,820	36,480	7,700
1938	98,980	54,950	340	54,610	44,220	9,690	34,530	10,390
1939	100,210	55,600	370	55,230	45,750	9,610	36,140	9,480
1940	101,490	56,180	540	55,640	47,520	9,540	37,980	8,120
1941	102,640	57,530	1,620	55,910	50,350	9,100	41,250	5,560
1942	103,690	60,380	3,970	56,410	53,750	9,250	44,500	2,660
1943	104,750	64,560	9,020	55,540	54,470	9,080	45,390	1,070
1944	105,750	66,040	11,410	54,630	53,960	8,950	45,010	670
1945	106,620	65,290	11,430	53,860	52,820	8,580	44,240	1,040
1946	107,590	60,970	3,450	57,520	55,250	8,320	46,930	2,270
1947	108,831	61,758	1,590	60,168	58,027	8,266	49,761	2,142
1948	109,924	62,898	1,456	61,442	59,378	7,973	51,405	2,064
1949	111,095	63,721	1,616	62,105	58,710	8,026	50,684	3,395
1950	112,237	64,749	1,650	63,099	59,957	7,507	52,450	3,142
1951	113,382	65,983	3,098	62,884	61,005	7,054	53,951	1,879
1952	114,589	66,560	3,594	62,966	61,293	6,805	54,488	1,673
1953	116,576	67,362	3,547	63,815	62,213	6,562	55,651	1,602
1954	117,664	67,818	3,350	64,468	61,238	6,504	54,734	3,230
1955	118,846	68,896	3,048	65,847	63,194	6,730	56,464	2,654

Economic Report of the President (20).

Table 26.- Number of commercial farms by economic class, United States and major geographic regions, specified years, 1929-54

Geographic region and economic class of farm 1/	Value of sales (1954 prices) 2/	Number of farms				
		1930	1940	1945	1950	1954
	Dollars	Thou.	Thou.	Thou.	Thou.	Thou.
United States:						
Class I	25,000 and over	47	60	91	103	134
Class II	10,000-24,999	205	252	347	381	449
Class III	5,000-9,999	560	585	723	721	707
Class IV	2,500-4,999	1,078	1,015	976	882	811
Class V	3/ 1,200-2,499	1,274	1,070	867	661	536
Class VI	3/ 250-1,199	1,559	1,283	937	717	463
All commercial farms	---	4,723	4,265	3,941	3,465	3,100
New England:						
Class I	25,000 and over	1	1	2	4	4
Class II	10,000-24,999	6	6	8	11	11
Class III	5,000-9,999	7	14	19	14	13
Class IV	2,500-4,999	30	19	12	14	11
Class V	3/ 1,200-2,499	20	14	7	5	3
Class VI	3/ 250-1,199	16	15	13	6	4
All commercial farms	---	80	69	61	54	46
Middle Atlantic:						
Class I	25,000 and over	2	3	5	7	8
Class II	10,000-24,999	16	17	22	30	34
Class III	5,000-9,999	52	44	51	52	48
Class IV	2,500-4,999	81	65	59	49	42
Class V	3/ 1,200-2,499	65	49	28	22	13
Class VI	3/ 250-1,199	49	43	31	19	14
All commercial farms	---	265	221	196	179	159
East North Central:						
Class I	25,000 and over	4	8	10	13	20
Class II	10,000-24,999	24	56	72	82	111
Class III	5,000-9,999	120	136	176	178	169
Class IV	2,500-4,999	250	257	207	191	158
Class V	3/ 1,200-2,499	221	164	115	91	86
Class VI	3/ 250-1,199	156	137	99	70	48
All commercial farms	---	775	758	679	625	592
West North Central:						
Class I	25,000 and over	12	12	22	21	26
Class II	10,000-24,999	65	79	126	121	143
Class III	5,000-9,999	214	194	259	250	236
Class IV	2,500-4,999	314	249	242	232	200
Class V	3/ 1,200-2,499	220	199	132	119	90
Class VI	3/ 250-1,199	151	169	98	76	56
All commercial farms	---	976	902	879	819	751

- Continued

Table 26. - Number of commercial farms by economic class, United States and major geographic regions, specified years, 1929-54 - Continued

Geographic region and economic class of farm 1/	Value of sales (1954 prices) 2/	Number of farms				
		1930	1940	1945	1950	1954
	Dollars	Thou.	Thou.	Thou.	Thou.	Thou.
South Atlantic:						
Class I	25,000 and over	3	5	6	8	11
Class II	10,000-24,999	13	16	18	21	30
Class III	5,000-9,999	34	45	44	50	71
Class IV	2,500-4,999	104	124	145	136	142
Class V	3/ 1,200-2,499	208	195	188	143	111
Class VI	3/ 250-1,199	336	259	218	160	102
All commercial farms	---	698	644	619	518	467
East South Central:						
Class I	25,000 and over	1	2	2	3	4
Class II	10,000-24,999	5	10	10	12	14
Class III	5,000-9,999	17	25	31	30	39
Class IV	2,500-4,999	74	78	107	82	106
Class V	3/ 1,200-2,499	198	187	206	144	137
Class VI	3/ 250-1,199	434	347	261	239	146
All commercial farms	---	729	649	617	510	446
West South Central:						
Class I	25,000 and over	6	9	12	17	21
Class II	10,000-24,999	37	27	36	46	44
Class III	5,000-9,999	36	57	68	72	64
Class IV	2,500-4,999	137	130	126	106	93
Class V	3/ 1,200-2,499	247	208	158	102	75
Class VI	3/ 250-1,199	360	250	178	121	74
All commercial farms	---	823	681	578	464	371
Mountain:						
Class I	25,000 and over	6	7	10	12	13
Class II	10,000-24,999	17	20	26	27	28
Class III	5,000-9,999	39	34	37	38	34
Class IV	2,500-4,999	50	41	34	35	30
Class V	3/ 1,200-2,499	50	30	20	17	12
Class VI	3/ 250-1,199	22	34	18	12	10
All commercial farms	---	184	166	145	141	127
Pacific:						
Class I	25,000 and over	12	13	22	19	27
Class II	10,000-24,999	22	21	29	31	34
Class III	5,000-9,999	41	36	38	37	33
Class IV	2,500-4,999	38	52	44	37	29
Class V	3/ 1,200-2,499	45	24	13	17	9
Class VI	3/ 250-1,199	35	29	21	14	9
All commercial farms	---	193	175	167	155	141

1/ For list of States included in each region, see footnote 1, table 5, page 20.

2/ Value intervals in earlier years deflated to 1954 level of prices received by farmers for farm commodities. See appendix for method used.

3/ Excludes farms whose operators worked off the farm as much as 100 days or those with other income of operator and family members greater than sales from the farm.

Table 27.- Number of part-time and residential farms, United States and major geographic regions, specified years, 1929-54

Geographic region 1/	Number of farms 2/				
	1930	1940	1945	1950	1954
	Thou.	Thou.	Thou.	Thou.	Thou.
New England	38	42	59	44	33
Middle Atlantic	72	85	112	108	89
East North Central	131	174	204	239	192
West North Central	81	123	116	146	140
South Atlantic	219	258	278	370	341
East South Central	171	207	222	329	293
West South Central	128	173	215	277	272
Mountain	31	45	48	49	50
Pacific	53	74	91	108	98
United States total	924	1,181	1,345	1,670	1,507

1/ For list of States included in each region, see footnote 1, table 5, page 20.

2/ Farms with sales of less than $2,499, provided the operator worked off the farm 100 or more days or the other income of the operator and family members was greater than sales from the farm. Value intervals in earlier years deflated to 1954 level of prices received by farmers for farm commodities. See appendix for method used.

Table 28. - Average cash wages paid per farm at current wage rates, by economic class of farm, United States, specified years, 1939-54 1/

Economic class 2/	1940	1945	1950	1954
	Dollars	Dollars	Dollars	Dollars
Commercial farms:				
Class I	4,130	7,580	9,152	8,300
Class II	690	1,325	1,548	1,166
Class III	250	465	557	422
Class IV	107	220	253	214
Class V	42	92	121	106
Class VI	20	51	46	43
All commercial farms 3/	175	466	674	715
Noncommercial farms	21	50	44	38
All census farms	129	326	449	477

1/ Estimates based on reports of the Census of Agriculture for the years specified.

2/ For definition, see table 4, page 19.

3/ Includes cash wages paid on farms classified as abnormal in the censuses of 1950 and 1954.

Procedure

The effect of changes in the census definition of a farm. - Over the years, the total number of farms in the United States has been subject to variations between censuses because of differences in the enumeration of small holdings with negligible farm production. This is due partly to differences in emphasis between censuses upon getting a complete count of these small holdings. Also, variations have resulted from the inability of census enumerators to determine uniformly which places to enumerate as farms. The most marked differences resulted from changes in the census definition of a farm and in census processing methods.

Generally, in censuses prior to 1950, there were enumerated as farms all places of 3 or more acres with any agricultural production and places of less than 3 acres, provided the agricultural production for home use or for sale amounted to $250.

Beginning with the census of 1950, the definition of a farm and the procedure for determining the units to be included as farms was changed considerably. The criteria used in the censuses of 1950 and 1955 called for classifying as farms places of 3 or more acres, provided $150 worth of agricultural products were produced, exclusive of a home garden, and places of less than 3 acres if farm sales amounted to $150. Instead of having enumerators determine which units to enumerate as farms, they were instructed to enumerate all places that might qualify as farms. The determination of which places to include as farms was made during office editing through uniform application of the criteria. This procedure may have resulted in more complete enumeration of small holdings than previous censuses, but the more restrictive definition reduced substantially the total number of farms. Thus, it affected considerably the comparability of the censuses of 1950 and 1955 to earlier censuses.

Comparison of the censuses of 1930, 1940, and 1945. - In the censuses of 1930, 1940, and 1945, the procedures and instructions used in enumeration were similar. Enumerators were instructed to enumerate as farms all places of 3 or more acres having any agricultural operations and places of less than 3 acres only if production for home use and for sale amounted to as much as $250. Probably there was very little difference in the field handling of places of 3 or more acres as enumerators had merely to determine whether or not any agricultural operations were carried on in the previous year or would be carried on in the current year. For places of less than 3 acres, however, the census field count was subject to variations because of changes in the unit prices farmers receive for their products. Farms of less than 3 acres were enumerated only if production was valued at $250 or more. Because of changes in farm prices, this required a considerably larger physical production in some years than in others. The net effect was enumeration of more of these small farms in years of higher prices than in years when prices were somewhat lower. It may be well to note, however, that farms of less than 3 acres account for a very small proportion of all farms. In the census of 1945, they accounted for a high of 2 percent and in the census of 1940, for a low of 0.6 percent.

In editing schedules in the Washington office of the Bureau of the Census for determination of units to be counted as farms, the procedures used in the censuses of 1930 and 1940 appear to have been similar. Questionnaires were examined for conformance with the same criteria that were set forth in enumerators' instructions. The 1930 census did not publish a record of the number of questionnaires rejected because of failure to meet the minimum criteria for retention as farms. A study of questionnaires rejected in the census of 1940 indicated that of a total of 44,704 schedules rejected in the Washington office, less than 22,000 were rejected because they failed to meet the minimum requirements of a farm. In the census of 1945, however, the criteria for retention of schedules in the Washington office were somewhat more restrictive for farms of 3 or more acres than those used by enumerators in the field. Farms of 3 or more acres were retained, provided they comprised as much as 3 acres of cropland or pasture regardless of the farm production in 1944, but for places that did not contain 3 acres of cropland or pasture, production amounting to $150 for either home use or sale, was required. In the 1945 census, 149,720 returns were rejected or combined. Most of them failed to meet the minimum requirements for a farm.

The somewhat more restrictive criteria for determining places to retain as farms in the census of 1945 were designed largely to cope with the particular situation at the time the census was taken. War had imposed scarcities of certain foods, and had stimulated production for home use and for incidental sales on many small acreages that had not previously been used for farm production. Numerous victory gardens located in the environs of towns and cities were included in the enumeration. Most of these gardens did not meet the usual concept of a farm. The more restrictive office edit of the 1945 census, as compared with those of 1930 and 1940, was oriented primarily toward obtaining greater comparability with earlier censuses rather than revising the definition of a farm.

The Census of 1950. - In the census of 1950, the instructions to enumerators and the office procedures were changed considerably. Instead of determining which places were farms, enumerators were instructed to enumerate all places locally called farms and also all places of 3 or more acres, whether or not they were considered farms. Determination of the places to retain as farms was made in the central office on the basis of these minimum criteria: (1) For places of 3 or more acres, $150 production, exclusive of a home garden, was required. This may have been production for home use or for sale. In the case of incomplete questionnaires, production was estimated from crops grown or from the livestock inventory. (2) For places of less than 3 acres, sales of farm products to the amount of $150 were required.

The procedure used in the 1950 census resulted in obtaining reports for more than a million places that were not counted as farms. There were no agricultural operations on 785,000 of these places, and agricultural production on the 247,000 with agricultural operations was not large enough to permit counting them as farms. The Bureau of the Census estimated that 150,000 to 170,000 of these would have been counted as farms if the same criteria had been used in 1950 as during previous censuses.

Applying the 1950 definition of a farm to earlier censuses. - In estimating the number of farms that would have been excluded in earlier years had the 1950 census definition of a farm been used, the midpoint of the census estimate - 160,000 - is taken as a base point for the calculations involved. As the census estimate dealt with numbers of places excluded in 1950 that would have been kept as farms under the 1945 definition of a farm, it is not entirely adequate to the task of applying the more restrictive 1950 definition for the purpose of determining numbers that would have been excluded in earlier censuses. In addition, the estimates made in this study involve setting up the minimum requirements in each of the earlier years in terms of constant physical output. The census estimate of 160,000 farms, however, is taken as a general indication of the difference between the definitions used in 1945 and 1950. The estimates made during the study reported here were made largely to adjust the census estimate for a somewhat different objective.

The minimum production requirements for retention of places as farms in the 1950 census and the equivalent production that would have been required in earlier years are set forth in table 29.

It will be observed that for places of 3 or more acres a larger value of production would have been required in 1944 than in 1949, despite the higher price levels that prevailed in 1949. This is because the censuses of 1945 and earlier years included the value of vegetables used from the home garden. Production from the home garden was not obtained in the 1950 census. For farms of this specified level of total production, this production averaged about $37, $20, and $30, respectively, for 1944, 1939, and 1929. This resulted in setting a somewhat higher minimum production value in 1945 to take account of the inclusion of the value of the home garden. For this reason, the census estimate of the change in farm numbers that resulted from the change in the definition of a farm was revised upward to 180,000 farms.

The number of farms that would have been excluded from the censuses of 1940 and 1930 was determined as follows: (1) Interpolations were made to estimate the number of farms (exclusive of zero-production farms) in

Table 29. - The minimum value requirements in the 1950 census definition of a farm and the equivalent values in earlier years adjusted for changes in prices received by farmers, United States, census years, 1929-49

Year	Value of production required for retention of places of 3 or more acres (1954 prices)	Value of sales required for retention of places of less than 3 acres (1954 prices)
	Dollars	Dollars
1950	150	150
1945	165	118
1940	77	57
1930	110	90

each year that were retained by the census but had physical production smaller than the minimum production criteria used in the 1950 census. These estimates were made separately for places of 3 acres or more and for places of less than 3 acres. (2) It was assumed that all farms that did not report any production were new operations or incomplete reports that would have been retained by the 1950 census as well. Each census retained as farms some places for which the production reported was insufficient but which had inventory items that indicated they normally would produce enough to be considered farms. (3) It was assumed further that the proportion of farms having insufficient production that would have been excluded in each of the earlier censuses is in direct proportion to the relationship of the number of these farms in 1945 to the 180,000 farms taken as representative of the difference between the 1945 and 1950 definitions. It is estimated that 285,000 places with reported production too small to meet the minimum requirements of the 1950 definition were counted as farms in the census of 1945. Of these, 180,000, or 65 percent, probably would have been excluded. Thus, it is assumed that approximately 65 percent of the farms for which insufficient production was reported in earlier years would have been excluded by the 1950 census definition of a farm.

It will be noted that for places of less than 3 acres the requirement of $250 production was more restrictive in years of low farm prices, such as 1939, than in years of relatively high prices, such as 1944.

Using the relationship of median value of production to average acreage, the total distribution of these places was estimated for each year and the numbers that would have been included by the 1950 census definition but excluded in earlier censuses were estimated. The estimate of changes in farm numbers that resulted from the change in the farm definition does not affect the number of commercial farms. The estimates were made for the purpose of improving the concept of residential farms and subsistence farms developed in this report - farms with sales of less than $250 at 1954 prices.

The completeness of the census enumeration. - It is known that in each census enumerators miss a certain number of farms. On the basis of a field quality check of the 1950 census, it was estimated that the census enumerators missed approximately 274,000 places that would have qualified as farms. (See Introduction, Vol. II, Census of Agriculture, 1950.) For the most part, these were small places with only a few acres of land and nominal production.

A postenumerative survey taken to check the completeness of the 1954 Census of Agriculture revealed that approximately 419,000 places that would have qualified as farms were missed by the census enumerators. (See Introduction, Vol. II, Census of Agriculture, 1954.) More than two-thirds of the places that were missed had farm sales of less than $1,200. Most of these farms would have been classified as part-time and residential in the census economic classification.

From the results of these surveys, it would appear that 145,000 of the 600,000 reduction in farm numbers between 1950 and 1954 was due to excess underenumeration in the latter census. On this basis, the net reduction in number of farms would amount to 455,000 for the 1950-54 period.

No comparable data are available on the completeness of earlier censuses. As each succeeding census has built upon the experience gained from earlier ones, the more recent censuses were designed to obtain more complete coverage. Improvements were made in the handling of multiple-unit operations in the South for better coverage of sharecropper farms. In the enumeration of Indian reservations, procedures were designed to obtain better coverage of individual tracts assigned to tribal members. Also, in the later years greater emphasis was placed on coverage of specialized types of operations such as greenhouses, nurseries and apiaries, which frequently are not considered locally to be farms.

On the other hand, the taking of the agricultural census has become increasingly complex because of the increase in the number of small part-time and residential farms. Many of these farms tend to be missed because they may not be considered farms by the enumerators. Also, the increasing numbers of nonresident operators create a problem in obtaining complete coverage. For example, the census of 1954 estimated that about a third of the 419,000 places missed by enumerators were those of nonresident operators.

The agricultural censuses of 1930, 1940, and 1950 were taken in the spring of these years in conjunction with the censuses of population. Enumerators were required to call at each household to complete the population schedule. For this reason, they were more likely to find and enumerate small farms that might otherwise be missed. In each of these years, a question on the population schedules related to whether or not the persons lived on farms. The census of 1950 had two questions on the population schedule designed to direct the enumerator to the taking of an agriculture questionnaire. These questions were: (1) Is this a farm? (2) Is this a place of 3 or more acres? Answers of "yes" to either of these questions indicated that an agriculture questionnaire might be required.

No attempt was made to correct for differences between censuses in completeness of coverage. It is realized that the number and size distribution of the farms missed affect, to a small extent, the trends set forth in this report.

Estimation of numbers of farms by constant physical output groups. - Trends in economic classes of farms developed in this report are based on the classification of farms in the censuses of 1930, 1940, and 1945, by total value of production. In order to set up groupings of farms with physical outputs comparable to the economic classifications of the censuses of 1950 and 1954, it was necessary to deflate the value intervals in earlier years to take account of changes in the level of prices received by farmers for farm commodities. The first step was to set up value groups of farms that represented constant levels of physical output. Next, part-time farms were separated from commercial farms on the basis of estimated numbers of operators working off farms 100 or more days, or having other income that exceeded sales from the farm.

The index of prices received. - As trends were developed at the geographic regional level, it was necessary to have an index of prices received for each region of the United States. There is at present no published index of regional prices. The Agricultural Marketing Service, United States Department of Agriculture, publishes currently an index

of prices received at the national level. In addition, most States have developed and publish currently State indexes of prices received. When available, the State indexes were used to obtain regional averages. Current indexes of prices received were available for 34 States. Seven other States had developed price series but the data were not current. For the remaining 7 States, indexes were computed by weighting United States commodity prices by the total production of each commodity in individual States. The State indexes were then averaged into regional indexes, using total production for the State in each year as a weighting factor.

The indexes of prices received by farmers that were developed and used in this report to determine constant physical output groups are shown in table 30.

Table 30. - Index of prices received by farmers for farm commodities, United States and geographic regions, specified years, 1929-54 1/

Index, 1954=100

Year	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	United States
1954	100	100	100	100	100	100	100	100	100	100
1949	106	106	96	97	101	94	96	103	99	100
1944	98	81	76	69	84	72	68	74	89	79
1939	52	47	37	36	38	33	33	37	40	38
1929	76	64	60	54	55	56	54	59	63	60

1/ For list of States included in each region, see footnote 1, table 4, page 19.

Establishing constant value intervals. - The economic classifications of 1950 and 1954 were on the basis of sales of farm products. The value groupings in the censuses of earlier years were on the basis of total farm production, for both home use and sale. The census of 1945 made cross-classifications of farms on both bases. Thus, using the

relationship of total production to sales of farm products in 1945, it was possible to set up total-value-of-product groups in 1945 equivalent to the sales groups used in the censuses of 1950 and 1954. After establishing the value-of-product equivalent for each value interval in 1945, value intervals for earlier years were determined by deflating the 1945 intervals to constant levels of prices received for farm commodities.

The limits of the class intervals by value of sales in 1950 and 1954 and their equivalent in total value of production in 1945 are shown for the United States and geographic regions in table 31.

The value intervals used in 1940 and 1930 were determined by multiplying the 1945 values by the appropriate regional index of prices received based on 1944 as 100.

It will be noted that the value of sales groupings for 1950 and 1954 are not changed in this report. While the level of prices received in 1954 was almost identical to that of 1949 for the United States as a whole, this was not true for most regions. The price changes were small, however, and it was decided that the effect on the groupings of farms between the 2 years would be relatively insignificant. For this reason, the numbers of farms by economic class presented here for 1950 and 1954 are taken directly as they appear in the census volumes, except for modifications made in the separation of part-time from commercial farms and in the separation of subsistence farms from the group classified as residential by the census.

Interpolations to determine numbers of farms in 1930, 1940, and 1945. - Numbers of farms were determined by interpolating. Interpolations of numbers of farms grouped by value of production is complicated because of the characteristic skewness of the distribution to the extreme left. That is, the majority of farms are concentrated in the smaller value intervals. Thus, the density of farms per unit of value interval is many times greater in the lower ranges of the value scale than at the upper range. In general, the density of farms per unit of value interval decreases at an increasing proportionate rate throughout the distribution. This means that within each successively larger value interval, an increasingly greater than proportionate number of farms is included below any given percentage increment of the value interval.

The method used for each interpolation was determined for each region by plotting the cumulated numbers against the values on arithmetic, semi-logarithmic, and double logarithmic paper. Straightline interpolation was then made by whichever method described the straightest line through the points to be interpolated. One of the following methods was

Table 31. - Limits of the value of sales intervals used in the census economic classifications of 1950 and 1954, and their equivalents in value of production, 1944, United States and geographic regions 1/

Value of sales 1949 and 1954 (dollars) 2/	Equivalent in total value of production, 1944									
	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	United States
25,000 ----------	25,090	20,780	19,480	17,740	21,616	18,675	17,425	18,940	19,565	18,900
10,000 ----------	10,300	8,580	8,000	7,365	8,965	7,790	7,210	7,760	9,155	7,890
5,000 ----------	5,345	4,462	4,150	3,850	4,720	4,100	3,805	4,025	4,710	4,125
2,500 ----------	2,845	2,400	2,200	2,055	2,535	2,220	2,070	2,135	2,185	2,245
1,200 ----------	1,575	1,340	1,175	1,105	1,395	1,215	1,120	1,150	1,350	1,300
250 ----------	590	490	380	340	525	445	415	380	455	450

1/ For list of States included in each geographic region see footnote 1, table 5, page 20.
2/ See table 27 for value-of-sales intervals.

used for each interpolation: (1) Arithmetic numbers against arithmetic values; (2) arithmetic numbers against logs of values; (3) arithmetic values against logs of numbers; or (4) logs of numbers against logs of values. It is believed that this procedure for interpolation resulted in reasonable accuracy and at the same time avoided the somewhat laborious process of computing the mathematical regressions of the distributions.

Separating commercial farms from part-time, residential, and subsistence units. - The criteria set forth in this study for part-time and residential farms is as follows: Part-time farms - farms with sales (valued at 1954 prices received by farmers) of $250 to $2,499 with the operator working off the farm 100 or more days or with other income of the family exceeding sales from the farm; Residential farms - farms with sales of less than $250 and with the operator working off the farm 100 or more days or with other income of the family exceeding sales from the farm. These criteria differ from the published census economic classification in these respects: (1) In the census classification, the upper value limit for part-time farms is set at $1,199. All farms with sales of $1,200 or more are considered commercial regardless of off-farm work or other income of the family. (2) The census classifies all farms with sales of less than $250 as residential, whereas in the study reported here an attempt was made to separate as subsistence farms the group that reports neither 100 or more days of off-farm work by the operator or other income exceeding sales.

The number of operators who worked off the farm 100 or more days were published by value groups in the censuses of 1945 and 1940. Thus, it was possible to determine numbers in physical output groups by interpolation. The 1930 census did not publish the number of days of off-farm work by value groups. Estimates of the number of operators who worked off the farm 150 or more days were obtained from data showing the number of abnormal farms by value groups. In the 1930 census, abnormal farms consisted chiefly of part-time farms - those with less than $750 agricultural production and with the operator working off the farm 150 days or more - but they also included institutional farms, country estates, farms on which income from boarders and lodgers constituted the major income, forest-product farms, horse farms, feed lots, and livestock dealers. Using as a general guide the distribution of abnormal farms by value groups under $750, the distribution of operators working off the farm 150 or more days was estimated for the entire range of value. These numbers were then converted to numbers working off the farm 100 or more days on the basis of the relationship for all farm operators of numbers working 100 days to those working 150 or more days.

As data showing the extent of other income of the operator family were not obtained in the censuses of 1930,1940, and 1945, estimates of part-time farms were made on the basis of those working off the farm 100 or more days. The numbers were then adjusted to take account of the additional families who probably had other income greater than income from sales. In making this adjustment, several sources of data were available to indicate the relationship of operators who worked off the farm 100 or more days to families with other income greater than sales. Unpublished tabulations of the census of 1950 indicated that for each 10 families whose operators worked off the farm 100 or more days, an additional 5 families whose operators did not work off the farm as much as 100 days had other income that exceeded income from sales. The relationship of 1:1.5 was also observed in unpublished data from the 1947 Enumerative Survey. Data from the 1940 census relating off-farm work of the operator to other income of the family have been summarized (3, table 40). Again the ratio appeared to be 1:1.5. In other words, extending the criterion for a part-time farm from 100 or more days of off-farm work to include also those families who reported other income greater than income from sales of farm products required an increase of approximately 50 percent in each of the time periods under consideration.

In order to portray better the regional differences in the extent of nonwork income other than that received by the operator from off-farm work, certain assumptions were made. It was assumed that the proportion of operators who worked off the farm from 1 to 99 days and who reported other income exceeding sales in 1949 held in earlier years as well. Farms whose operator families had nonfarm income were then computed as a proportion of the sum of operators who worked off the farm for 100 or more days and those who worked off the farm from 1 to 99 days and reported other income exceeding sales. The totals derived for regions were then forced to add to a predetermined total for the United States that was based only on operators who worked off the farm 100 or more days expanded by 1.5.

Estimates of trends in commercial farms by relative scale of operations. - According to the concept developed in this study, farm size as it relates to the family farm is relative to technological developments that have (1) increased yields per crop acre and per animal unit and (2) decreased labor needs, thereby giving man greater control over other resources of production. Under these conditions, a family-scale farm, for example, is one which over the years under consideration produced a physical volume of farm production consistent with the increasing productive capacity of the farm family labor force. As a device for holding technology constant, the value intervals of the physical output groups

were deflated further by an index of farm output per man-hour of labor. The value intervals established as comparable for grouping commercial farms by the relative scale of operations are set forth in table 32.

Estimates of low-income commercial farms. - For the purpose of determining what would be considered low-income farms, the commercial farms were separated on the basis of gross sales levels that were estimated to reflect levels of net cash farm operator income. As a base point for making estimates, it was assumed that commercial farms with sales of $250 to $2,499 in 1954 were representative of what may be considered low-income commercial farms. By the classification criteria used, farm sales were the major source of income to families on these farms and the farm operators did not work off the farm as much as 100 days during the year.

The numbers of low-income farms in census years prior to 1954 were estimated by (1) determining the gross sales required in each year to return an income comparable to that received, on the average, from sales of $2,500 in 1954 and (2) interpolating to determine the number of commercial farms having gross sales of less than those amounts in each of the years.

In arriving at a comparable net income and the gross sales required in years prior to 1954, two concepts of income were used - (1) real income and (2) relative income.

The former relates to constant purchasing power. The latter relates to a purchasing power that varies with the average purchasing power of average incomes in the economy at large.

On a real income basis, low-income commercial farms are those with gross farm sales of a value below that needed to return a real net cash farm operator income from farming equivalent to that received, on the average, from $2,500 gross sales in 1954. On a relative income basis, low-income commercial farms are those with gross sales below that required to return a net cash operator income from farming that is relative to that received, on the average, from gross sales of $2,500 in 1954, when account is taken of the changes in real income per capita for the United States as a whole.

The procedure for setting up the gross sales equivalents used in determining the number of low-income farms is shown in table 33. Cash receipts from farm marketings computed at 1954 prices (col. 1) was divided by operators' real net cash income from farming (col. 2) and expressed as cash receipts per dollar of operators' real net cash

Table 32. - Value of sales intervals used in classifying commercial farms by scale of operation, United States, specified years, 1929-54

Scale of operation	1954	1949	1944	1939	1929
	Dollars	Dollars	Dollars	Dollars	Dollars
Value of sales in current dollars: 1/					
Large-scale farms	25,000 and over	20,000 and over	12,750 and over	5,000 and over	6,250 and over
Family-scale farms	2,500-24,999	2,000-19,999	1,275-12,749	500-4,999	625-6,249
Small-scale farms	Under 2,500	Under 2,000	Under 1,275	Under 500	Under 625
Value of sales in 1954 dollars: 2/					
Large-scale farms	25,000 and over	20,000 and over	16,000 and over	13,000 and over	10,750 and over
Family-scale farms	2,500-24,999	2,000-19,999	1,600-15,999	1,300-12,999	1,075-10,749
Small-scale farms	Under 2,500	Under 2,000	Under 1,600	Under 1,300	Under 1,075

1/ Values were deflated by an index of prices received by farmers and by an index of output per man-hour of labor.

2/ Values deflated by an index of output per man-hour. Using these values, interpolations were made using the number of farms grouped by value of sales in 1954 dollars, table 4, page 19.

Table 33. - Computation of gross sales equivalents used in estimating the number of low-income farms, United States, 1929-54

Year	Cash receipts from farm marketings valued at 1954 prices 1/	Farm operators' real net cash income from farming purchasing power at 1954 prices 2/	Cash receipts per dollar of real net cash farm operator incomes: Col. 1 + Col. 2 / 3/	Cash receipts per dollar of real net cash farm operator incomes: Index 1954=100	Gross sales equivalents of real income at 1954 prices: $2,500 = Col. 4 4/	Disposable personal income per capita purchasing power at 1954 prices 5/: 6/	Disposable personal income per capita purchasing power at 1954 prices 5/: Index 1954=100	Gross sales equivalents of relative income at 1954 prices (Col. 5 x Col. 7) 7/
	1,000 dollars	1,000 dollars	Dollars		Dollars	Dollars		Dollars
1929	19,044	6,973	2.73	76.3	1,905	1,069	68.1	1,295
1939	20,607	6,030	3.42	95.5	2,390	1,041	66.3	1,585
1944	25,949	14,662	1.77	49.4	1,235	1,621	103.3	1,275
1949	27,753	9,594	2.89	80.7	2,020	1,423	90.7	1,830
1954	29,714	8,307	3.58	100.0	2,500	1,569	100.0	2,500

1/ All sales of crops, livestock, and livestock products.
2/ Deflated by the index of prices paid by farmers for family living items.
3/ Cash receipts required, on the average, to return each dollar of real net cash operator income from farming.
4/ Volume of sales valued at 1954 prices, required to return a real net cash operator income from farming equivalent to that received on the average, from farm sales of $2,500 in 1954.
5/ Economic Report of the President (20).
6/ Dollar estimates in current prices divided by the consumer price index on a 1954 basis.
7/ Volume of sales, valued at 1954 prices, required to return a net cash operator income from farming relative to that received from farm sales of $2,500 in 1954, when account is made for changes in real disposable personal income per capita for the United States.

The Farm Income Situation (11), except as otherwise indicated.

income from farming (col. 3). This was computed as an index (col. 4). The index (col. 4) was multiplied by $2,500 to give the gross sales required to return to a farm operator real net cash income equivalent to that realized, on the average, from $2,500 gross sales in 1954 (col. 5).

In order to convert the gross sales equivalent of real income (col. 5) to a relative income basis, the gross sales equivalent was multiplied by the index of real per capita income (col. 7). This gave the gross farm sales equivalent of relative income (col. 8).

Estimate of the value of farm sales for 1929. - The census of 1930 did not publish the total value of farm products sold from farms grouped according to value of production. The proportions of farm sales originating from specified value groups of farms, as shown in this report, were estimated from the distribution of the number of farms grouped on the basis of the total value of farm production. The average value of production per farm was estimated for each value group and the averages were multiplied by the number of farms to obtain the total value of production. It was assumed that the distribution of farm sales was similar to the distribution of the total value of production.

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