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UNITED STATES DEPARTMENT OF AGRICULTURE
MISCELLANEOUS PUBLICATION No. 264

WASHINGTON, D. C.

ISSUED JULY 1937

A GRAPHIC SUMMARY OF FARM MACHINERY, FACILITIES, ROADS, AND EXPENDITURES

(BASED LARGELY ON THE CENSUS
OF 1930 AND 1935)

By

O. E. BAKER

**Senior Agricultural Economist
Bureau of Agricultural Economics**



This publication is one of a projected series of 10 publications, as follows:

A Graphic Summary of Physical Features and Land Utilization in the United States	O. E. Baker
A Graphic Summary of Farm Tenure	H. A. Turner
A Graphic Summary of Farm Taxation	Donald Jackson
A Graphic Summary of the Value of Farm Property.	B. R. Stauber and M. M. Regan
A Graphic Summary of Farm Machinery, Facilities, Roads, and Expenditures	O. E. Baker
A Graphic Summary of Farm Labor and Population.	J. C. Folsom and O. E. Baker
A Graphic Summary of the Number, Size, and Type of Farms, and Value of Products	O. E. Baker
A Graphic Summary of Farm Crops	O. E. Baker and A. B. Genung
A Graphic Summary of Farm Animals and Animal Products.	O. E. Baker
A Graphic Summary of Farm Mortgage Debt.	D. L. Wickens and N. J. Wall

This series, which has been prepared under the general direction of O. E. Baker, senior agricultural economist, will bring up to date the Graphic Summary of American Agriculture published in 1931 as Miscellaneous Publication 105.

The Graphic Summary of American Agriculture first appeared in the 1915 Yearbook of Agriculture (also issued as Yearbook Separate 681), and was largely based on the 1910 census. The second was contained in the 1921 Yearbook (also issued as Yearbook Separate 878), and was based largely on the 1920 census. The third was published as Miscellaneous Publication No. 105, in May 1931, and was based both on the 1925 Agricultural Census, and the annual estimates of the Bureau of Agricultural Economics. It was divided into 11 sections, but these sections were bound together and issued only as a single publication. It was more inclusive than previous issues, particularly of maps and graphs relating to the economic and social aspects of agriculture.

The publications in this series devote still more attention to economic and social conditions. They are based on both the 1930 and 1935 census reports, as well as the annual estimates of the Bureau of Agricultural Economics. They deal not only with changes between 1930 and 1935 but also, with the changes during the decade of urban prosperity and agricultural depression that preceded the more general depression. Most of the distribution maps for crops and many of those for livestock present the 1929 census returns, because the drought of unprecedented severity and extent in 1934 would make such maps for 1934 misleading. Several increase and decrease maps, however, show the changes that occurred between 1929 and 1934, or 1930 and 1935.

The graphic presentation was designed and drafted under the direction of R. G. Hainsworth, in charge of the Graphic Section of the Bureau of Agricultural Economics.

Most of the clerical work was done under the supervision of N. P. Bradshaw, who also prepared the indexes.

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By O. E. BAKER, *senior agricultural economist, Bureau of Agricultural Economics*

FARM MACHINERY

The invention of farm machinery and the application of animal and later mechanical power to agriculture have brought about a great economic revolution. During the century ended in 1930 a threefold increase in production per worker in agriculture took place in the United States as a result of progress in science and invention. Before the recent economic depression this advance in efficiency of production gradually released an increasing proportion of the people for the manufacture of goods in factories, for the transport and merchandising of these goods, and for the multiplicity of services that modern people desire. A century ago about three-fourths of those gainfully employed in the United States were engaged in agriculture. In 1930 less than one-fourth were so engaged; fully three-fourths were in nonagricultural occupations. The agricultural revolution greatly facilitated the industrial and commercial revolution.

The manufacture of machinery in the cities involves much labor, but apparently the cost of this labor (including capital investment involved) is only 4 or 5 percent of the average value of farm products per worker. In manufacturing as a whole the number of persons employed has been declining since 1923. As not only a proportionately but also an absolutely smaller number of persons are needed in both agriculture and manufacturing, it is necessary that a larger number be employed in trade and transportation or in the services—clerical, personal, governmental, professional, etc.—or they will remain unemployed in varying degree. In round numbers the proportion of the gainfully employed engaged in trade and transportation increased from 9 percent in 1870 to 21 percent in 1930, and in the services from 15 percent to 27 percent.¹

¹ PRESIDENT'S RESEARCH COMMITTEE ON SOCIAL TRENDS. THE UTILIZATION OF NATURAL WEALTH. *In Recent Social Trends*, v. 1, ch. 2, pt. 2. New York. 1933. See pp. 99, 293.

The difference between the prices received by the producer and those paid by the consumer has increased, as the number of intermediaries has increased. That the distribution service rendered has increased or improved accordingly is frequently questioned. With the professions and personal services, on the other hand, there has been a great increase in at least the skill of the service offered, and with the governmental services a great increase in extent and complexity.

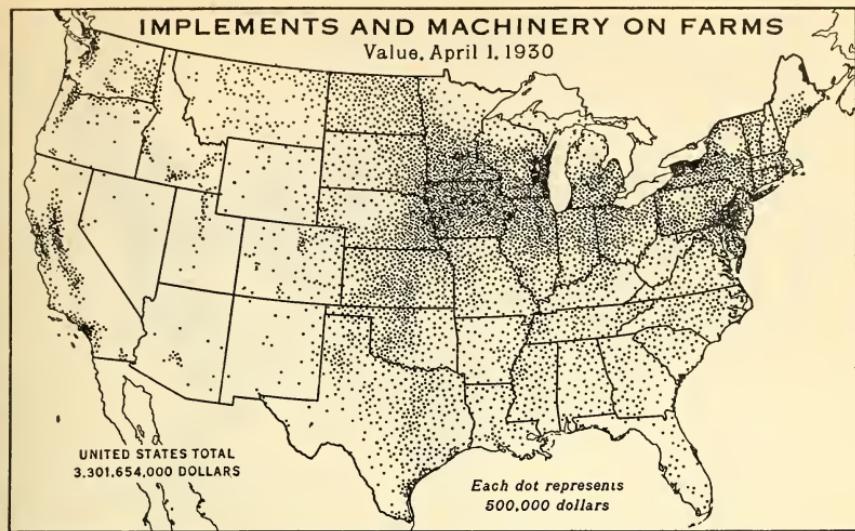
During the recent economic depression the trends of a century were reversed. Millions returned to the farms seeking shelter and sustenance and the migration of youth from the farms was retarded. The proportion of the population engaged in agriculture increased, production per worker decreased, and the standard of living, except for food, declined.

Increasing use of machinery has been accompanied, apparently, by less economic security, and the resulting urban life has been associated with a declining birth rate. The division of labor, use of power, and increase of production incident to the use of machinery has not been clear gain. The defects are not to be attributed to science and invention, but to the inability of the people to develop an adequate economic and social organization.

Looking to the future there can be little doubt that science and invention and improvements in technique will continue, but whether they can be utilized as fully as in the past is uncertain. It appears that prosperity promotes the use of machinery in agriculture, and that adversity tends to reverse this process. As late as January 1, 1936, practically 2,000,000 survivors of the back-to-the-land movement of the depression period were reported as still on farms, mostly in areas of poor soils or hilly surface and near the industrial cities. The purchase of farm machinery was greatly reduced during the depression years, and on most farms did not counterbalance depreciation. The trend in agriculture in some districts was backward, toward the partially self-sufficing, largely hand-labor type of farming.

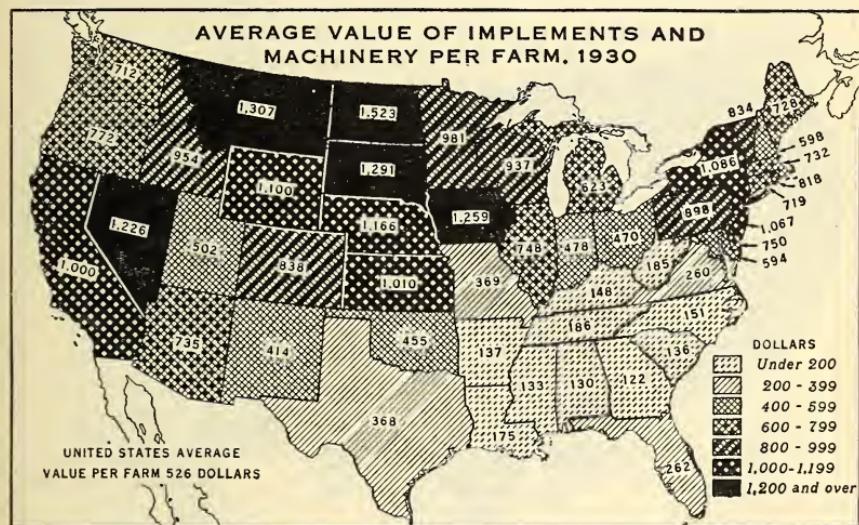
If urban employment becomes available for the youth not needed in agriculture, and if wages rise, it seems probable that the proportion of the gainfully employed population who are engaged in farming will again decline. For example, the corn harvester might be more extensively used, and a cotton picker might come into use. Nearly one-third of the farmers of the Nation grow cotton, and the labor used in production of cotton and corn is about half that used on all crops. But if unemployment induces the backing up of youth on farms and the purchasing power of farm products again becomes low, the sales of machinery will again be affected.

Possibilities in the use of agricultural machinery are as wide as ever before, but the future is so clouded by social and economic developments—notably the rapid decrease in births and the approach of a stationary population, the drift of rural wealth to the cities and concentration of wealth in the cities, with resultant effects upon the purchasing power of the people—that it is impossible to estimate with confidence how long the present upward trend in use of farm machinery will continue.



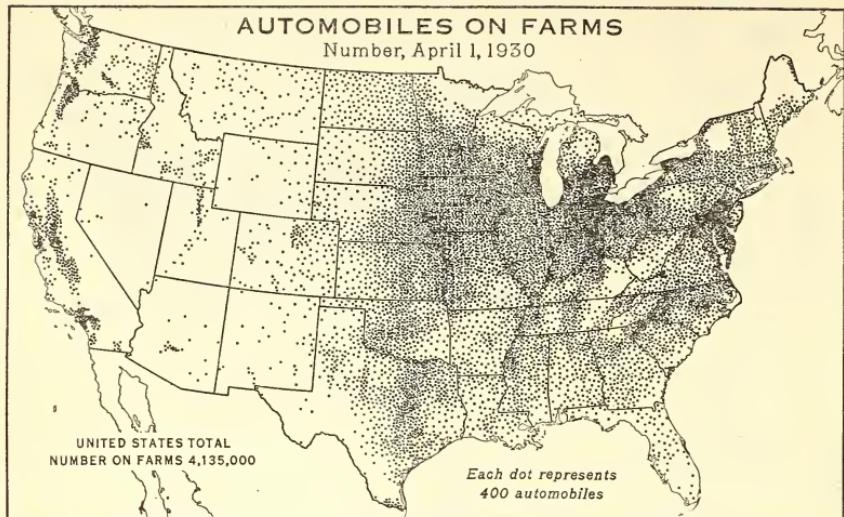
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FIGURE 1.—About one-fourth of the value of implements and machinery in the United States is in the Corn Belt and another fourth is in the Hay and Dairy Belt. The districts of greatest concentration are southeastern Pennsylvania, western New York, eastern Wisconsin, and the valleys of California. In the Cotton Belt, on the other hand, particularly the eastern and central portions, low-priced labor and the necessity of picking cotton by hand have tended to discourage the use of machinery. Automobiles are included in the value of implements and machinery.



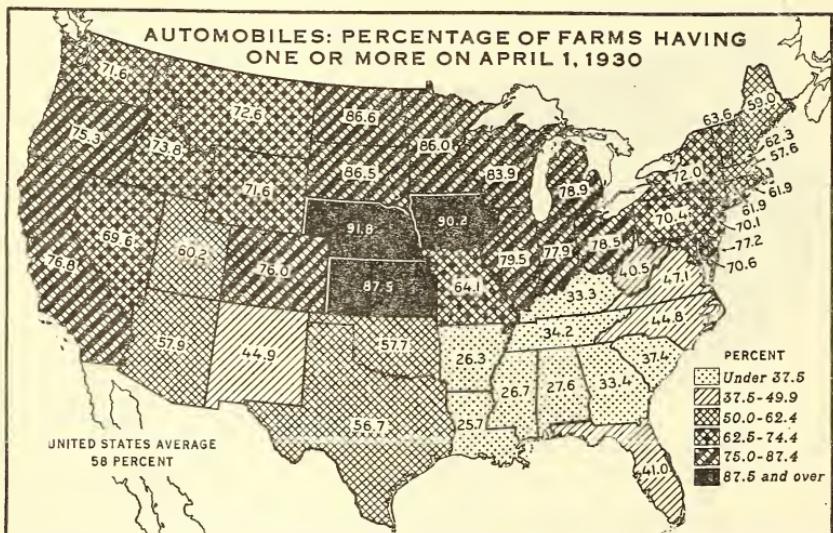
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FIGURE 2.—The average value of implements and machinery per farm exceeded \$1,000 in 10 States in 1930; 6 of these were included wholly or in part in the Great Plains, where wheat is the leading crop. In the eastern Corn Belt the average value of machinery per farm is about half that in the western prairie portion, where the farms are larger. In the eastern Cotton Belt States the values are only about one-tenth those in Iowa and the Dakotas. In general, each \$100 increase in value of machinery is accompanied by an increase of \$100 to \$200 or more in annual value of products per farm.



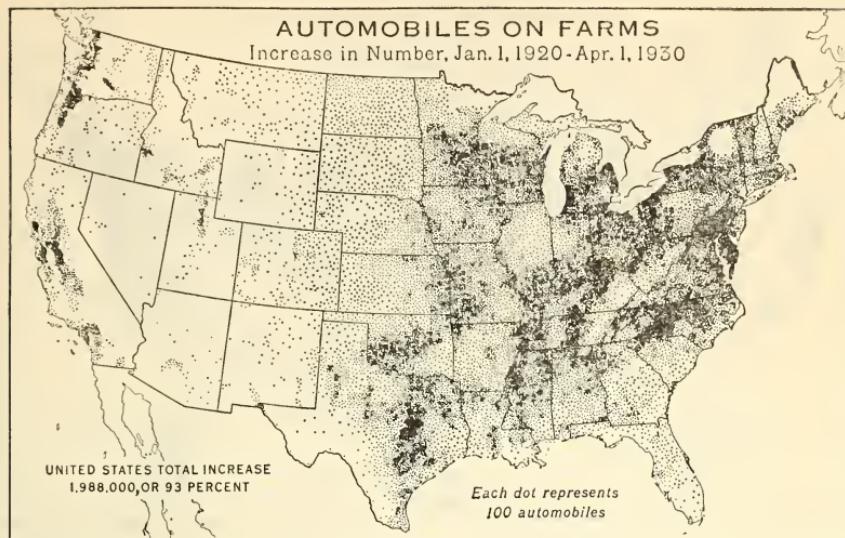
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FIGURE 3.—Most of the automobiles on farms are in the Hay and Dairy Belt, the Corn Belt, and adjacent portions of the Corn and Winter Wheat Belt. The greatest densities are where the farms are rather small but productive, notably southeastern Pennsylvania, western New York, western Ohio, eastern Indiana, and in the valleys of the far West. In the wheat regions, because of the large farms and sparse population, the density is thin. In the southern Appalachians and the Ozarks there are few automobiles, because of poor roads and the small farm incomes.



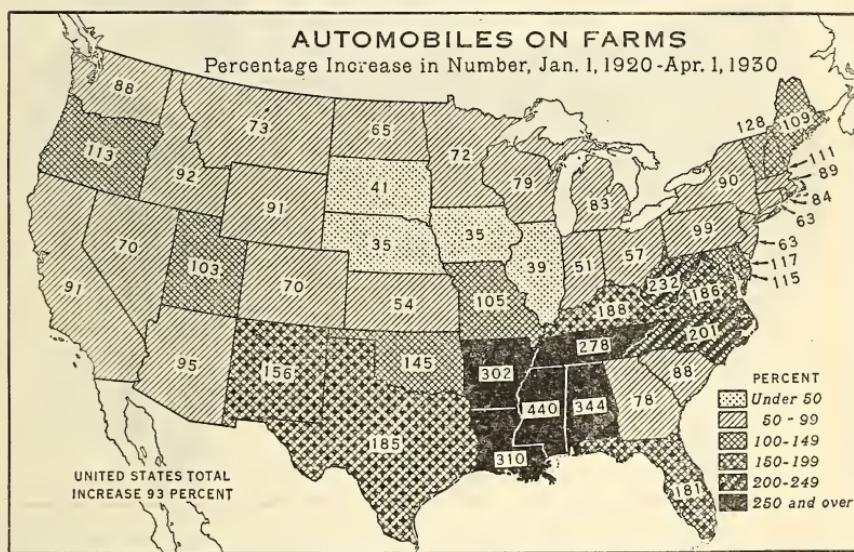
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FIGURE 4.—More than half the farms in the United States reported automobiles in the census of 1930—in Iowa and Nebraska more than 90 percent. In nearly every Northern and Western State the proportion exceeded the national average, and in every Southern State, except Delaware and Maryland, it fell below. The proportions in Oklahoma and Texas, however, were close to the national average. If cropper farmers, who are really laborers, are excluded, the proportions in many parts of the South would be raised. In all the North Central States, except Missouri, more than three-fourths of the farmers had automobiles.



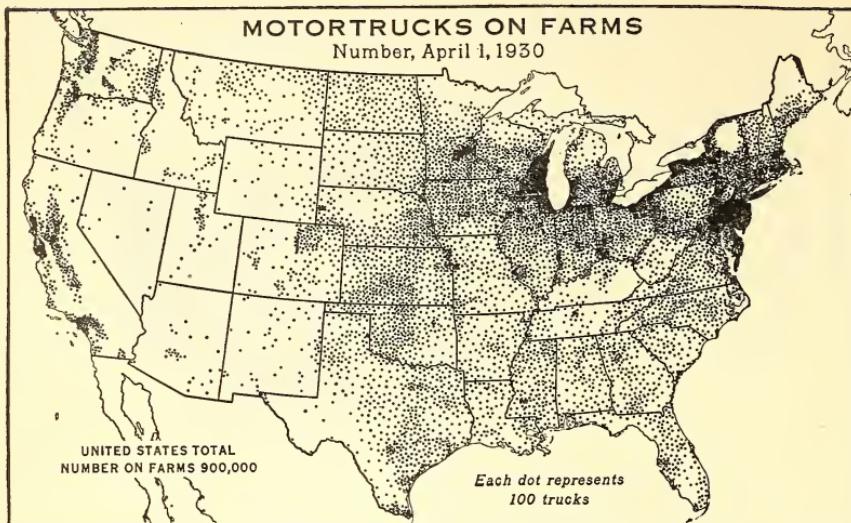
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FIGURE 5.—The greatest increase in automobiles on farms during the predepression decade took place in areas of good to fair soil; but not in the rich lands of the Corn Belt where, presumably, most farmers had acquired automobiles during the preceding decade. Especially heavy were the increases in the Hay and Dairy Belt of the North and East, in southeastern Pennsylvania and the Delaware-Maryland Peninsula, in the North Carolina piedmont, the bluegrass district of Kentucky, and southward into Tennessee; also westward across southern Indiana and Illinois to southwestern Missouri and central Oklahoma, and in the richer parts of the Cotton Belt.



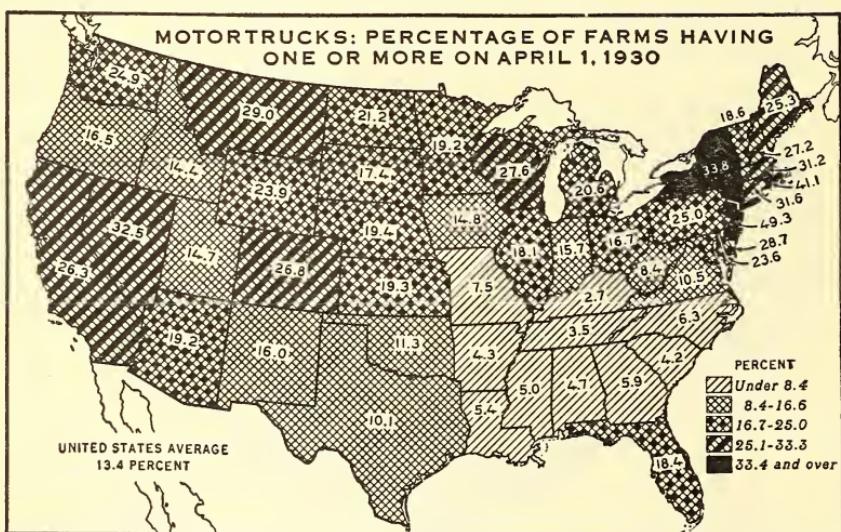
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FIGURE 6.—The number of automobiles on farms in the United States nearly doubled between 1920 and 1930 and in some of the Southern States the increase exceeded 300 percent. The cause of the wide variation in increase in these Southern States is not clear. But evidently many southern farmers who had not bought automobiles during the years of the World War were able to buy them during the predepression decade. In Illinois, Iowa, and Nebraska, where automobiles had already become very common, the increase was less than 40 percent between 1920 and 1930.



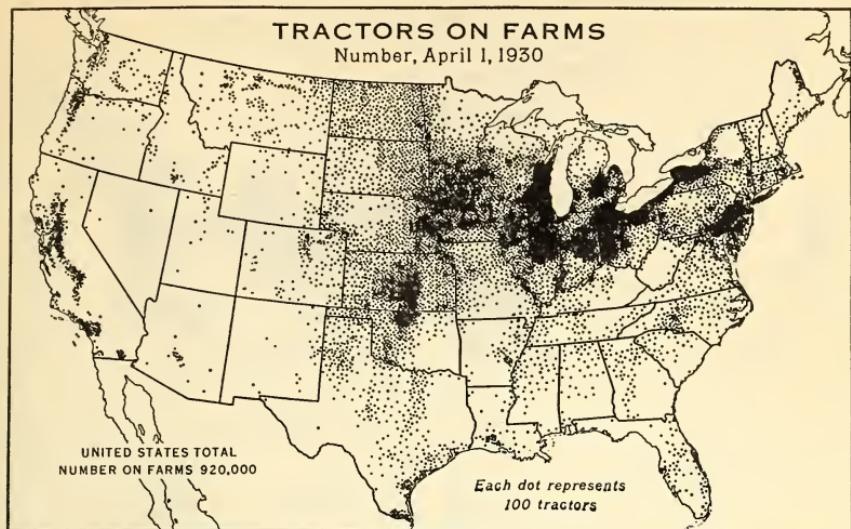
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FIGURE 7.—The regional distribution of motortrucks on farms in 1930, the latest year for which census data are available, is densest in eastern Wisconsin, most of New York and southern New England, and, notably, in New Jersey, southeastern Pennsylvania, Delaware, and much of Maryland. The map suggests an association with dairying and truck growing. Note the concentration around the cities—Cincinnati, St. Louis, Kansas City, for example—and the scarcity in Kentucky, with the exception of the area surrounding Louisville, even in the nonmountainous parts.



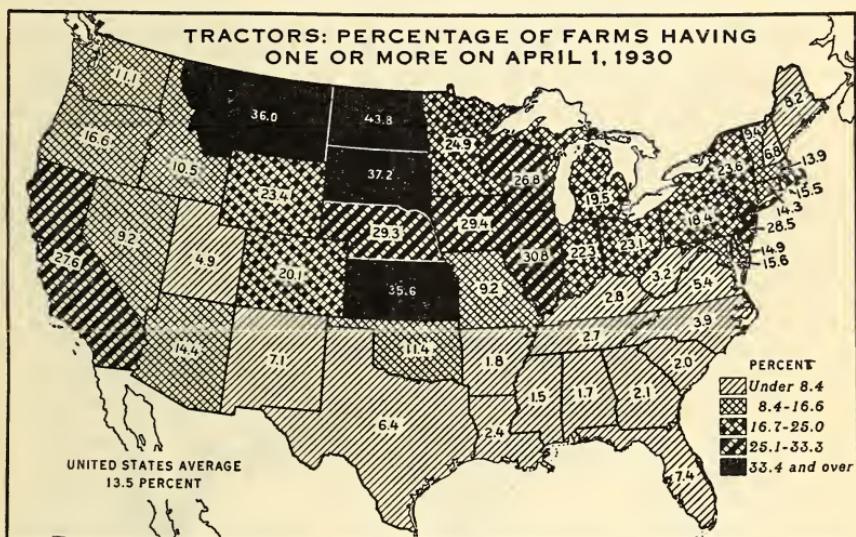
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FIGURE 8.—Practically half the farms in New Jersey, a dairy, truck, and fruit State, and a third of those in New York State had motortrucks in 1930. In the New England States (except Vermont), in Delaware, Pennsylvania, Wisconsin, Colorado, Montana, Nevada, and California, motortrucks were reported from a fourth to a third of all farms. On the other hand, in most of the South the proportion was less than 10 percent. This proportion is greatly reduced in the Cotton Belt by the small cropper and tenant holdings in plantations.



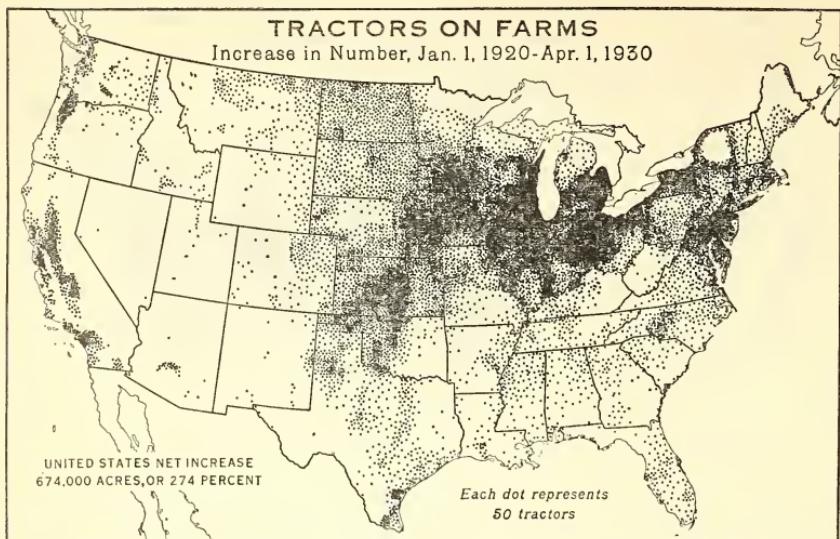
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FIGURE 9.—Tractors are most numerous in the Corn Belt, in the Hay and Dairy Belt, including southeastern Pennsylvania, in the Hard Winter and Spring Wheat Belts, and in California—regions where fertile soils and progressive farmers, but not necessarily large farms, are found. In the southern Appalachian Mountains, in the Ozarks, and in the Ouachitas there are few tractors, for most of the land is too hilly and the fields too small to use tractors advantageously. There are few tractors in the Cotton Belt, for the acreage of cotton a farmer can handle is usually limited by the acreage he can pick by hand.



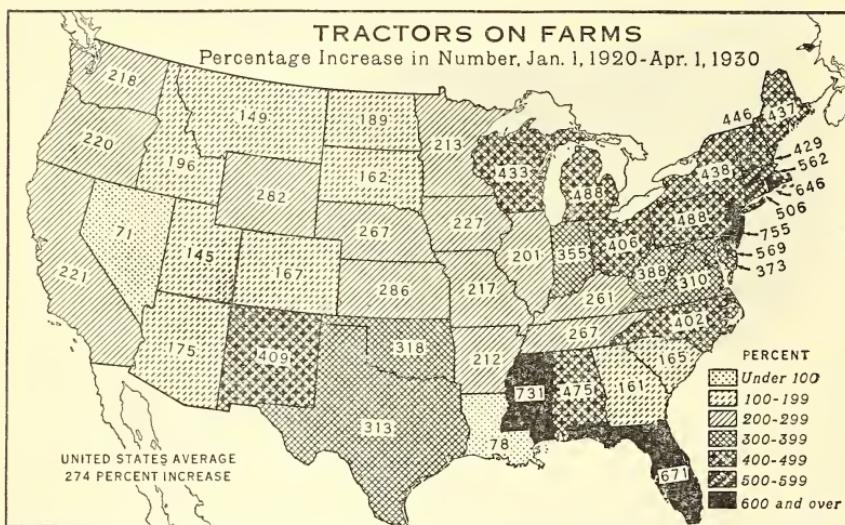
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FIGURE 10.—A larger proportion of the farms have tractors in the wheat regions, where farms are larger than elsewhere; but the proportion is high also in the Corn Belt, in Wisconsin, in New Jersey, and in California. In the last two States many farms are small, but the vegetables and fruits grown there require intensive cultivation. As compared with 30 percent or more of the farms having tractors in the wheat regions in 1930, less than 3 percent had tractors in much of the South.



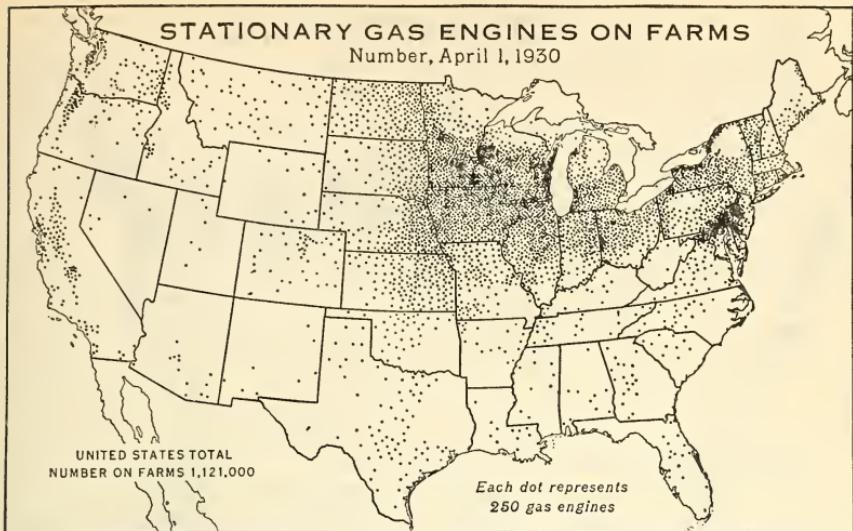
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FIGURE 11.—Most of the increase in number of tractors on farms between 1920 and 1930 took place in the Hay and Dairy Belt, including southeastern Pennsylvania, in the Corn Belt, in the wheat regions (particularly central Kansas), in California, and in the Willamette Valley of western Oregon. The increase in number was small in the Cotton Belt, and was even smaller in the southern Appalachian, Ozark, and Ouachita mountain areas. Cotton culture is not yet adapted to mechanization, except in the Yazoo delta and in Texas. Mountain agriculture probably never will be so adapted.



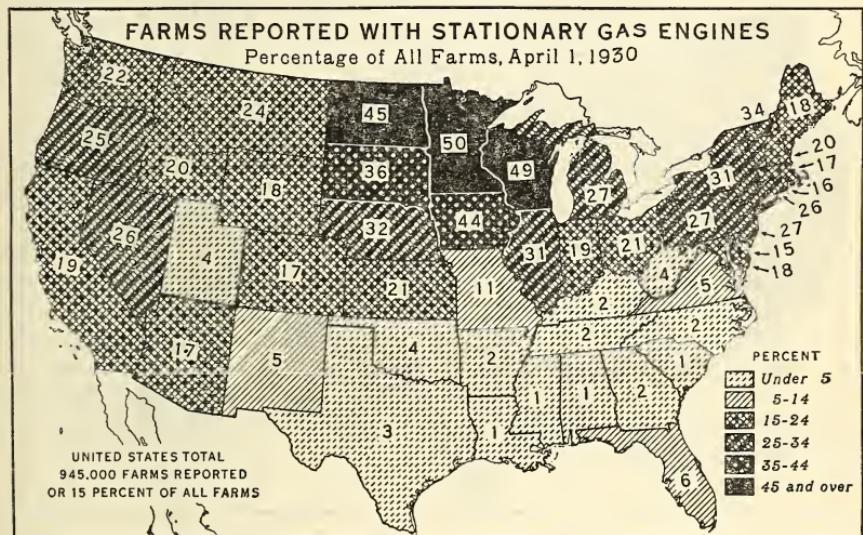
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FIGURE 12.—Although there were relatively few tractors in the South in 1930, the percentage increase was large between 1920 and 1930 in several Southern States. In Mississippi, tractors are being used on the cotton plantations of the Yazoo delta, and in Florida on the larger fruit farms. The percentage increase was large in New Jersey; and in the entire Hay and Dairy Belt, except Minnesota, the increase exceeded 400 percent. The 300- to 400-percent increase in Texas, Oklahoma, and New Mexico was associated with the expansion of grain and cotton production onto the semiarid plains.



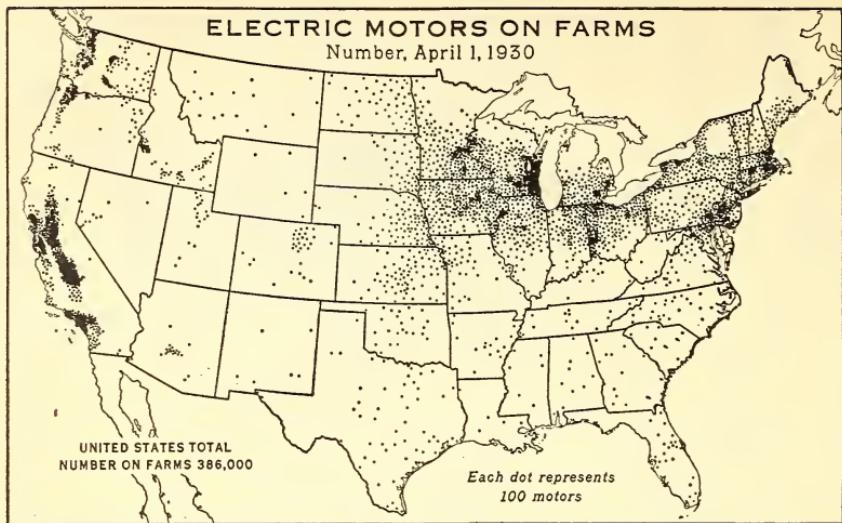
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FIGURE 13.—Stationary gas engines are most numerous on the farms of the Hay and Dairy Belt, where much water is pumped for the livestock and cleansing of the utensils, and are almost as numerous in the Corn Belt. Considerable numbers are found in the wheat regions and in California, western Oregon and Washington, and the Columbia Plateau. Very few are reported from the South—fewest of all in the southern Appalachians and in the Coastal Plain of the Carolinas and Georgia. In these regions the farms are small and the farm people are generally poor.



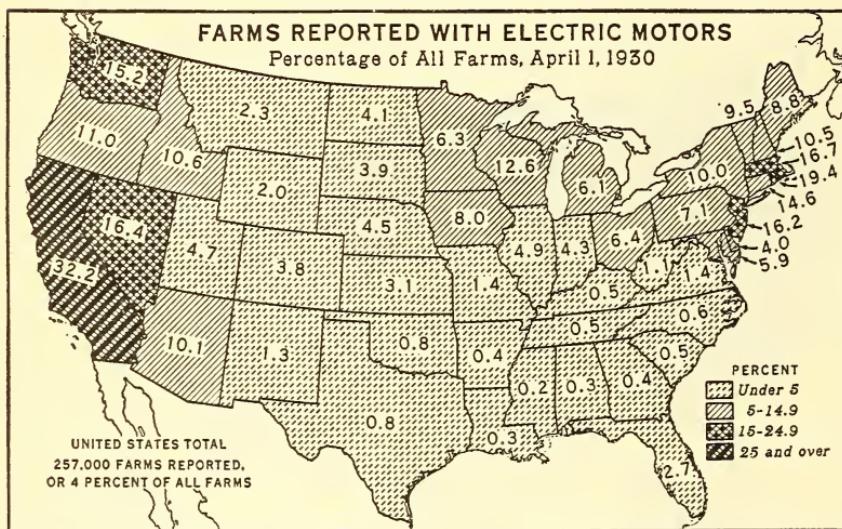
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FIGURE 14.—About one-half the farms in Wisconsin and Minnesota had gas engines in 1930 and from 19 to 44 percent in the other dairy States and in the Corn Belt. Some States, like California, that have fewer stationary gas engines have more electric motors (see fig. 16). In nearly all the Northern and Western States from one-fourth to one-half or more of all farms have one or the other of these forms of power. But in most of the South only 1 to 3 percent of the farms had such power in 1930—little power, low production; or, perhaps, low production, little power.



BAE31267

FIGURE 15.—Electric motors are most numerous on the farms of California, and there are large numbers in the valleys of Oregon, Washington, and Idaho, in the Hay and Dairy Belt, particularly eastern Wisconsin, eastern Massachusetts, and southeastern Pennsylvania, and in the Corn Belt, notably the western-Ohio portion. But in the remainder of the Nation the numbers are few. Some of the farms in the wheat regions, however, have electric motors and some in the irrigated valleys of the West.



BAE31309

FIGURE 16.—Nearly one-third of the farms in California reported electric motors in 1930. Electric power is available to a large proportion of the farmers, and as the price of power is low, large quantities are used in pumping water for irrigation. In Utah, by contrast, few farms have electric motors and even fewer have stationary gas engines (see fig. 14). In the Hay and Dairy Belt a considerable proportion of the farms have electric motors, ranging from 6 percent in Minnesota to 19 percent in Rhode Island. Less than 1 percent of the farms in the South had electric motors in 1930.

FARM FACILITIES

Farm facilities is a new phrase that has come into use in the Bureau of the Census and the Bureau of Agricultural Economics to cover such home conveniences as electric light, running water in the house, a bathroom, a telephone, a radio, etc. The census of 1920 was the first to obtain returns from farmers as to whether water was piped into the house and whether there was a telephone and electric light. Inquiry as to a radio outfit in the home was added in the Agricultural Census of 1925; and water piped into a bathroom was included in the Population Census of 1930. In 1935 a greatly shortened schedule was used, and all questions on farm facilities were omitted.

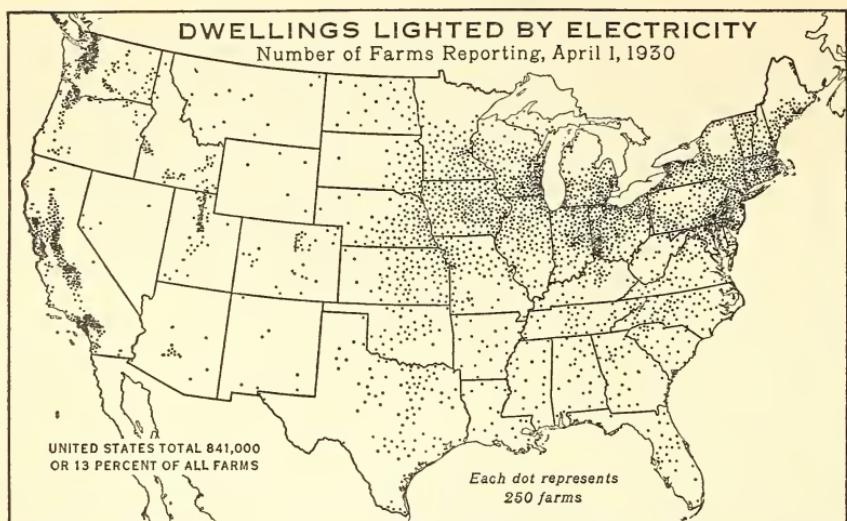
The proportion of farm families having facilities is not associated as closely as might be expected with average farm income. The Pacific Coast States and Utah, and the North Atlantic Coast States including New York and Pennsylvania, have a higher proportion of farms with these conveniences than the other States, except that the prairie portion of the Corn Belt has a higher proportion of farms with telephones.

The North Atlantic States are dominantly industrial or commercial and urban; in southern New England particularly, the urban and the rural are frequently intermingled in what has been called a "rurban" culture. There are many part-time farms in these North Atlantic States, located mostly around the cities. As these farms are small and often closely spaced along the highways, it becomes feasible for urban electric-power companies to extend their lines to serve these rural people. Then the people themselves, having income from other sources than agriculture, can afford to have these conveniences. Moreover, as they are associated with urban activities they are more accustomed to such conveniences than people living in remote rural districts. Furthermore, there are few tenant farmers in the Northeastern States.

In the Pacific Coast States conditions are similar. There is much part-time farming, particularly near the cities, many of the fruit growers and poultry farmers were former city dwellers, electric power is generally cheap, and the manner of life is modern.

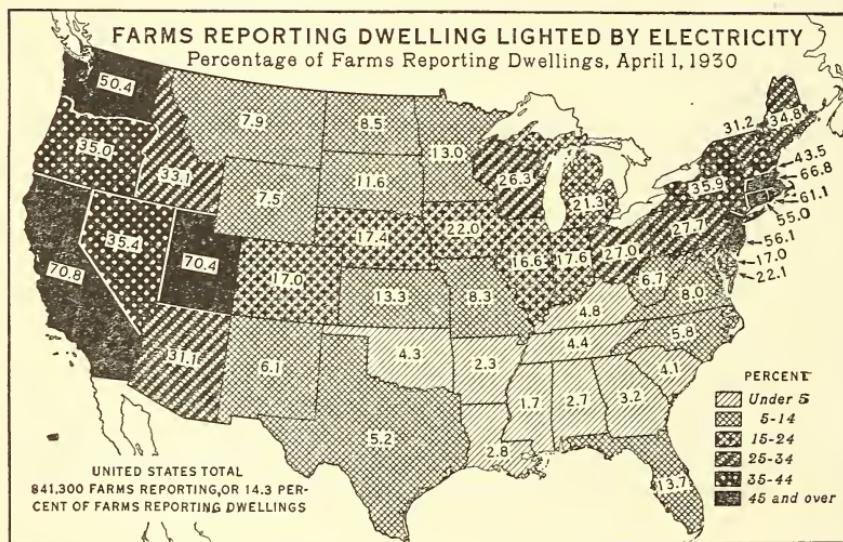
In the South, by contrast, two-thirds of the farmers are tenants or croppers, many of the plantation owners live in the towns or cities, the majority of the farmers are very poor, few have experienced the conveniences of modern urban life, and a vigorous desire for such things has not yet been awakened.

There is no doubt that the rural people deserve to have these conveniences, but for as large a proportion of rural as of urban people to have them would involve debt in a large proportion of the families, under present conditions, and ultimately the loss of farm ownership in many cases. Such conveniences are seldom provided in tenant houses.



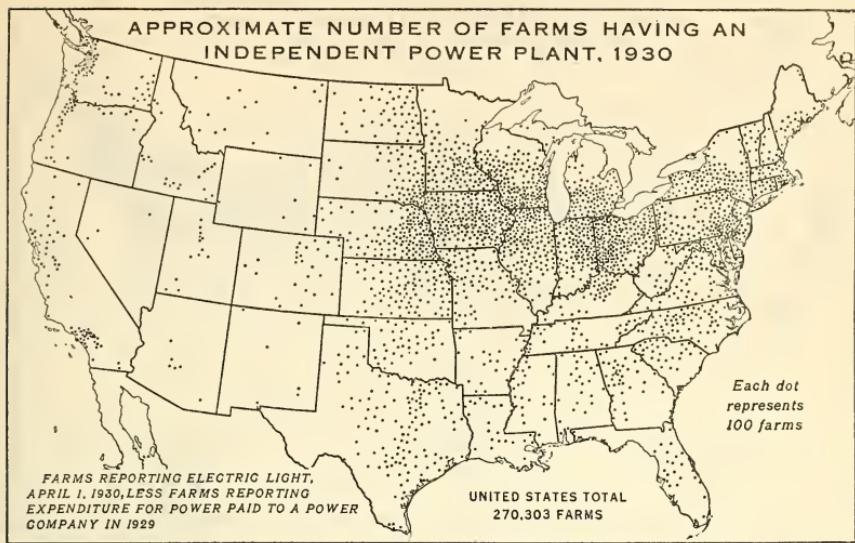
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FIGURE 17.—Most of the farm families who enjoy the advantages of electric light live in the Hay and Dairy Belt, in the Corn Belt, and in the valleys of the far Western States. There are a few such favored farms in the wheat regions and a few in the Cotton Belt, particularly in the Carolinas, Texas, and Oklahoma. Southeastern Pennsylvania, the Ontario lowland of New York, western Ohio, and southeastern Wisconsin, stand out in number of farms having electric light, as they do in use of other forms of power.



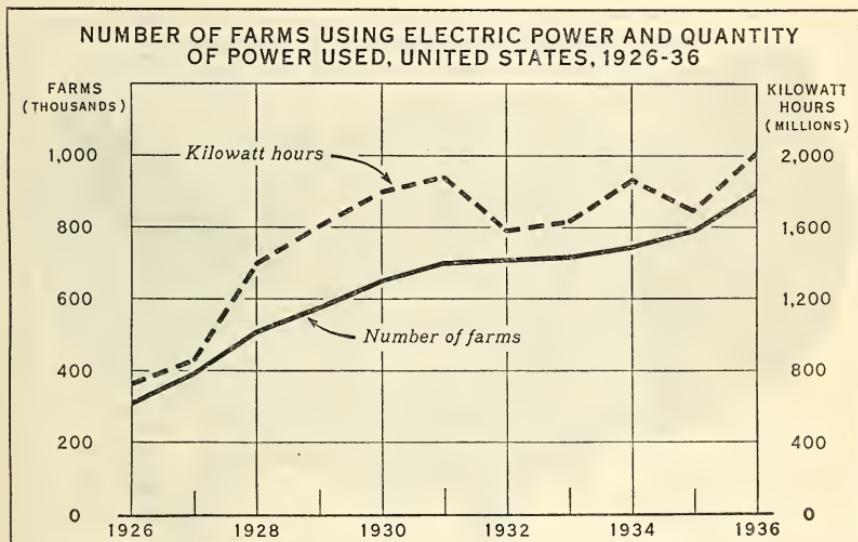
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FIGURE 18.—Although few farmers in Utah have stationary gas engines or electric motors, 70 percent had electric light in their homes in 1930 and the proportion was equally high in California. It exceeded 50 percent in southern New England, New Jersey, and Washington. The large proportion of the farmers who live in villages in these States doubtless accounts in part for this high proportion having electric light. In the Hay and Dairy Belt the proportion ranged, in general, from 20 to 60 percent, in the Corn Belt from 15 to 25 percent, in the Cotton Belt from 2 to 6 percent.



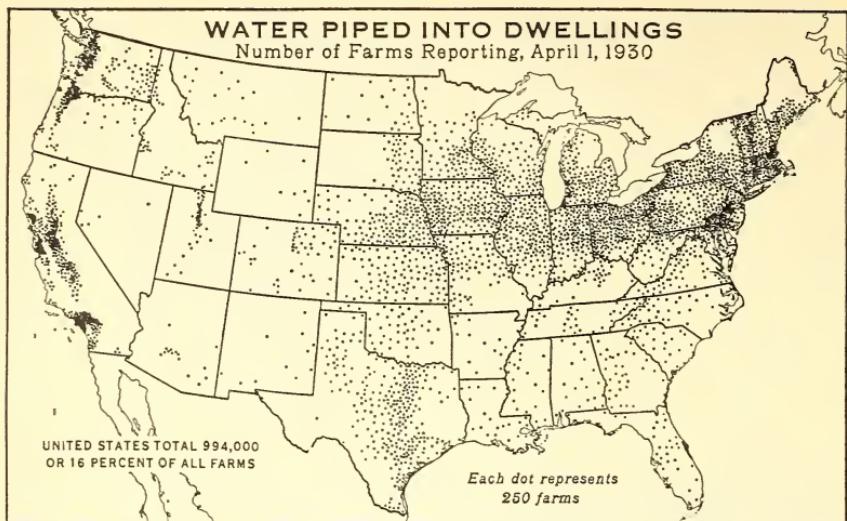
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FIGURE 19.—Most of the farms that have an independent electric-power plant are located in the Corn Belt and the Dairy Belt. There are a considerable number in Virginia and Missouri, in the bluegrass district of Kentucky, in the wheat regions, in the valleys of the far Western States, and in the Cotton Belt, particularly the Carolinas, Georgia, and Texas. The total number of farms having an independent power plant in 1930 was less than half the number of those who purchased power from a power company.



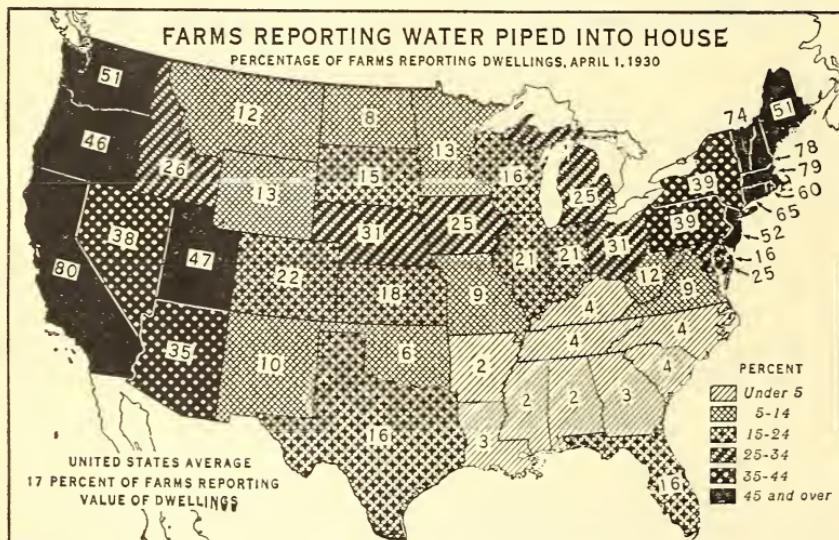
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FIGURE 20.—The number of farms using electricity increased rapidly during the last decade. In 1926 about 190,000 farms in the humid eastern half of the United States were using electric power. By 1936 the number had increased to 660,000. The annual kilowatt hours per customer increased from 586 to 941, but the cost declined from \$52 to \$48. West of the one hundredth meridian, where much power is used to pump irrigation water, farm customers increased from 119,000 in 1926 to 240,000 in 1936, kilowatt hours per customer from 5,882 to 6,087, and cost declined from \$120 to \$100. Based on estimates of the Edison Institute.



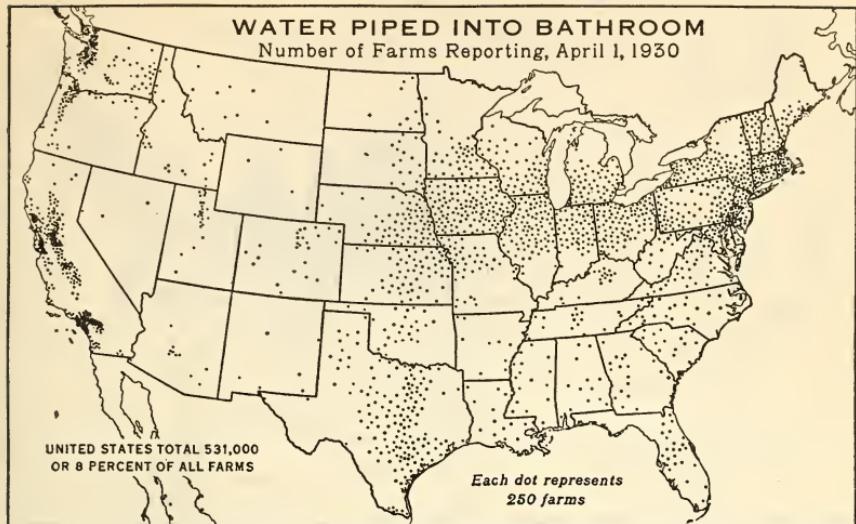
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FIGURE 21.—Farms having water piped into the dwelling house are most numerous in the Pacific Coast States and Utah, in the Corn Belt and in the Hay and Dairy Belt, particularly the eastern part. There are a considerable number in central and southern Texas and in Kansas. There are only a relatively few of such farms in the Spring Wheat Belt and the number in the South, excluding Texas and western Oklahoma, is smaller. In the entire United States, practically 1,000,000 farms had water piped into the dwelling in 1930. This is less than one farm in six.



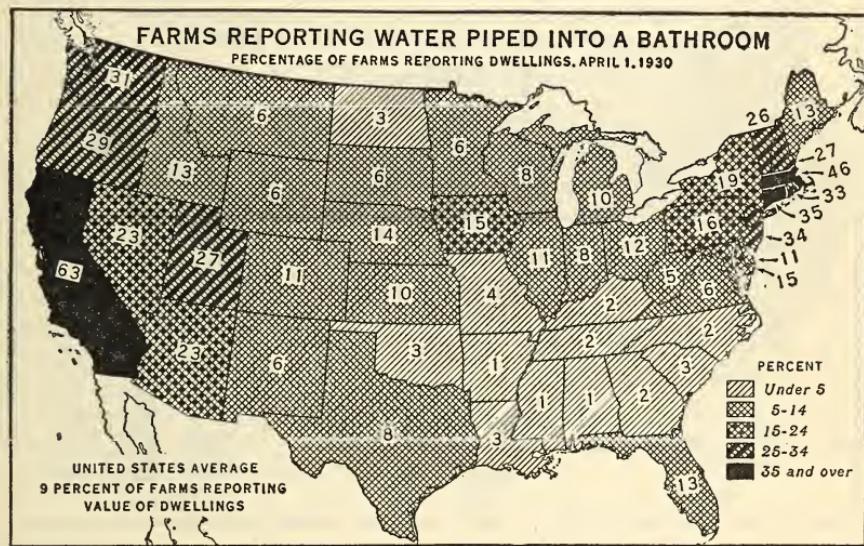
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FIGURE 22.—Over three-fourths of the farms in California and about one-half those in Oregon, Washington, and Utah had water piped into the house in 1930. In New England the proportions likewise ranged from 51 to 79 percent. In the Dairy Belt, outside New England, the proportion ranged from 13 percent in Minnesota to 52 percent in New Jersey, in the Corn Belt from 21 to 31 percent, but in the Cotton Belt, east of Texas and Oklahoma, from 2 to 4 percent. These figures reflect social standards as well as economic conditions.



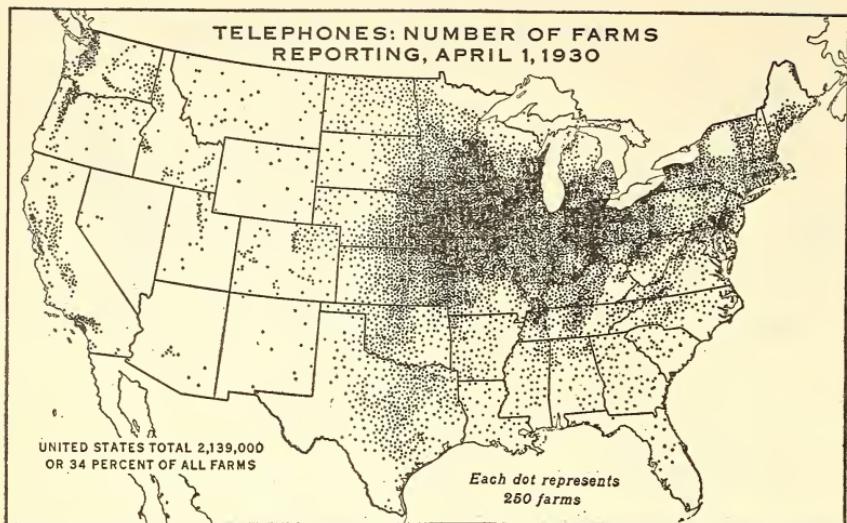
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FIGURE 23.—Only a little over half the farms that have water piped into the dwelling have water piped into a bathroom, but the geographic distribution is much the same. Most of the farms having a bathroom are located in the Pacific Coast States, Utah, the Corn Belt, the Hay and Dairy Belt, and Texas. There are only a few such farm bathrooms in the Dakotas, only a few in the Southeast of Texas, except in Virginia and Florida. The number is very small in Tennessee, Kentucky, the southern parts of Ohio, Indiana, and Illinois, and in much of Missouri.



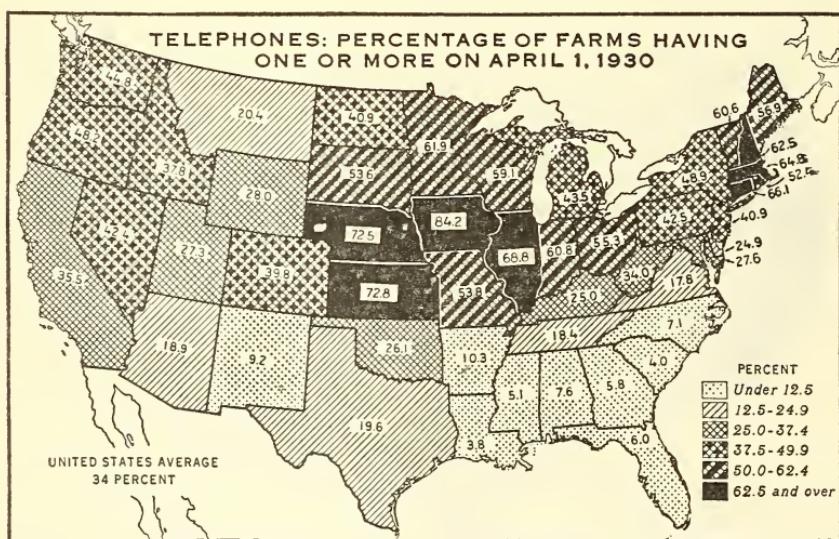
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FIGURE 24.—Nearly two-thirds of the farms in California in 1930 had a bathroom with running water, and over a fourth in Oregon, Washington, and Utah. In southern New England and New Jersey a third to a half had bathrooms. The proportion is relatively high in the other Northeastern States, and fairly large in Iowa, Nebraska, and Florida. Except for Iowa, Nebraska, and California, these are not rich agricultural States. Evidently the customs of the people, as well as their incomes, influence the proportion of the farms that have bathrooms and other amenities of life.



BAE31269

FIGURE 25.—Farms having telephones are located mostly in the Hay and Dairy Belt and the Corn Belt, but the number of such farms is large in southern Indiana and Illinois, and in Kentucky and Tennessee outside the mountains, also in southwestern Missouri, in Kansas, the western half of Oklahoma, and in much of Texas. As usual, the valleys of California, Oregon, and Washington show up clearly. One-third of the farms in the Nation had telephones in 1930, which is over twice as many as had water piped into the house, or had electric power.



BAE1224YB

FIGURE 26.—Nearly seven-eighths of the farms of Iowa had a telephone in 1930, and nearly three-fourths of those of Nebraska and Kansas. About two-thirds of the farms of Illinois, Connecticut, and Massachusetts had telephones, and three-fifths of those of Vermont, New Hampshire, Maine, Indiana, Wisconsin, and Minnesota. In most other Northern and Western States the proportion varied from a fourth to a half; but in the Cotton Belt east of Texas from only 4 to 10 percent. There is a closer relation between average farm income and proportion of farms having telephones than there is with the other home conveniences.

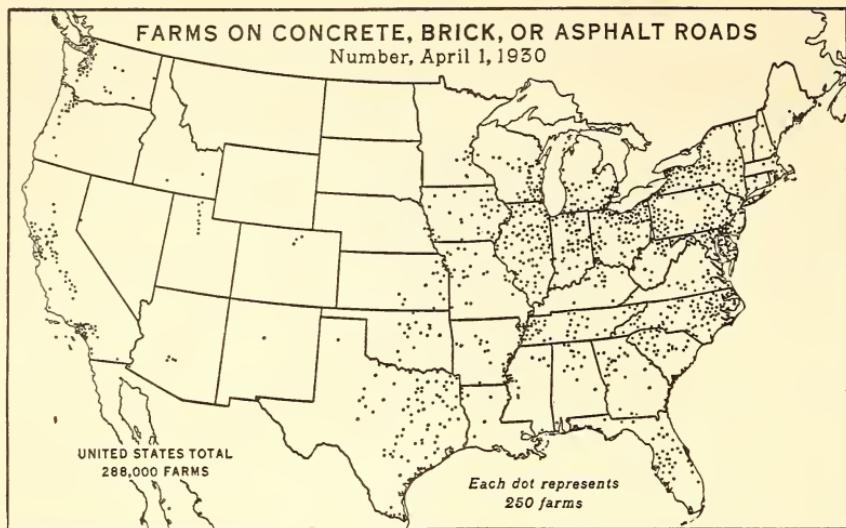
ROADS

Probably no factors have affected American agriculture more profoundly during the last quarter of a century than the gas engine and hard-surfaced roads. Use of the automobile and the tractor has reduced the number of horses and mules by about one-third and released probably 40,000,000 acres of cropland, and as much more pasture, for meat and milk production. This has induced vast regional shifts in crop and livestock production.

The demand for hard-surfaced roads has been met in different ways in different localities. By 1930 only 3.4 percent (perhaps 5 percent by 1937) of the farmers of the Nation were located on concrete or brick roads. This type of construction, the most expensive form, is most common in the densely populated, industrial and wealthy States north of the Potomac and Ohio Rivers, and in the Carolinas, in Tennessee, Texas, and California. Macadam roads provided nearly 5 percent of the farmers of the United States in 1930 with year-round service, but in the bluegrass district of Kentucky and in northwestern Ohio nearly 50 percent of the farms were located on such roads. Gravel roads adjoined 20 percent of the farms of the United States, but about 50 percent of the farmers of southwestern Ohio and central Indiana lived on such roads.

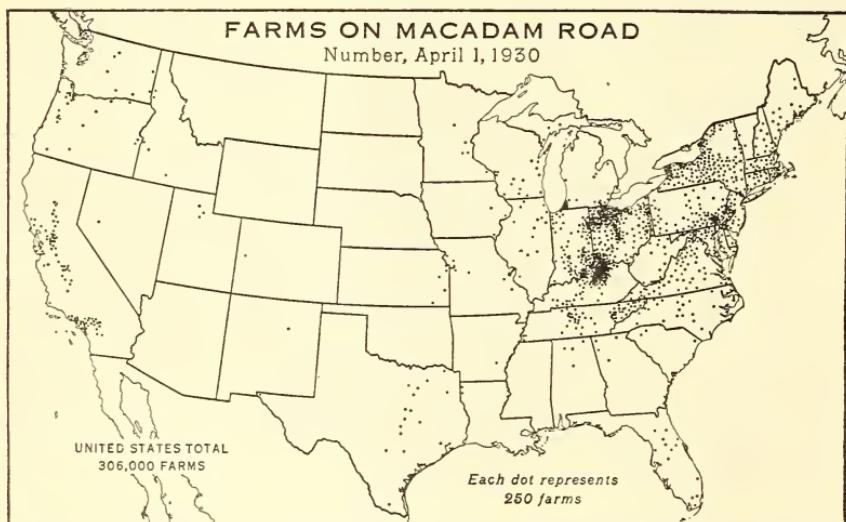
In all, one-third of the farms in the Nation were provided on April 1, 1930, with roads of a quality of gravel or better. But in Indiana three-fourths of all farms, in Ohio over two-thirds, in Massachusetts, New Jersey, Michigan, Wisconsin, Oregon, and Washington from 56 to 65 percent, and in California 50 percent of the farms were on such roads. Improved dirt roads adjoined 29 percent of the farms and unimproved dirt roads 36 percent of the farms of the United States in 1930. In the Great Plains States 80 to 90 percent of the farmers lived on dirt roads. But doubtless many of these farmers had hard-surfaced roads part of the way to town.

A new development deserves notice. Automobiles and good roads have encouraged many factory workers and professional and business men to live on a small place a few miles out of the city, have a garden, keep some chickens and occasionally a cow, and thus supply part of the family food. Many such places are reported by the census as farms. Between 1920 and 1935 an increase of 99 percent occurred in farms of 3 to 10 acres, and of 35 percent in farms of 10 to 20 acres. Much of this increase took place near the towns and cities. On the other hand, the farms of all the larger size groups decreased in number, except a 2-percent increase in farms of 175 to 259 acres, and 18-percent increase in those of over 500 acres. Apparently the automobile has increased the number of small farms more rapidly than the tractor has increased the number of large farms.



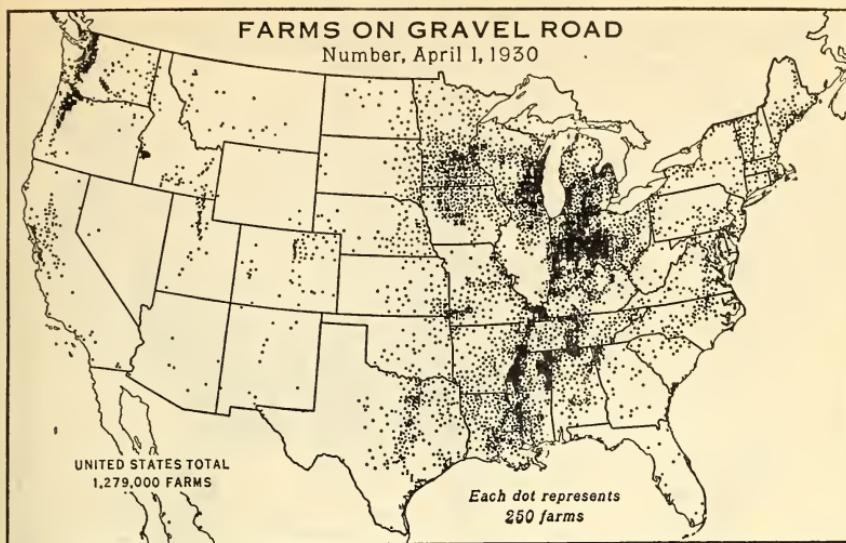
BAE31227

FIGURE 27.—The construction of concrete roads has progressed farthest in the manufacturing region that extends from Massachusetts to Maryland and westward to Wisconsin and Illinois. Outside this region concrete roads serve the most farms in the Carolinas, Tennessee, Texas, and California. But the number of farms on concrete and brick roads increased notably between 1925 and 1930 in many States. For the Nation as a whole the increase was 38 percent. The percentage increase since 1930 is not known, but is undoubtedly large.



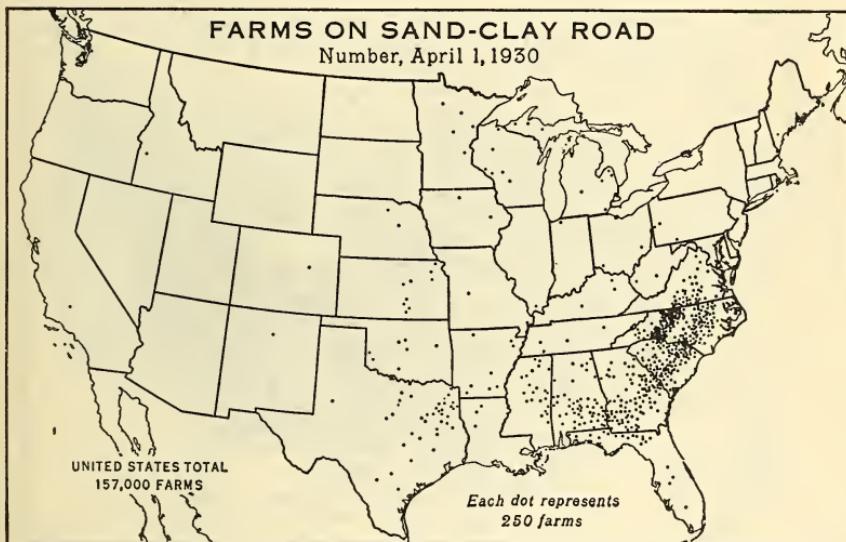
BAE31228

FIGURE 28.—Farms on macadam roads are located mostly in the bluegrass district of Kentucky, in Indiana, Ohio, New York State, and southeastern Pennsylvania, with somewhat fewer farms served in New England, New Jersey, Maryland, Virginia, the limestone portions of Tennessee, and in California. In these areas stone for crushing is available almost everywhere. In the entire Nation the number of farms on macadam roads decreased from 317,000 in 1925 to 306,000 in 1930, due doubtless in many cases, to replacements by concrete roads.



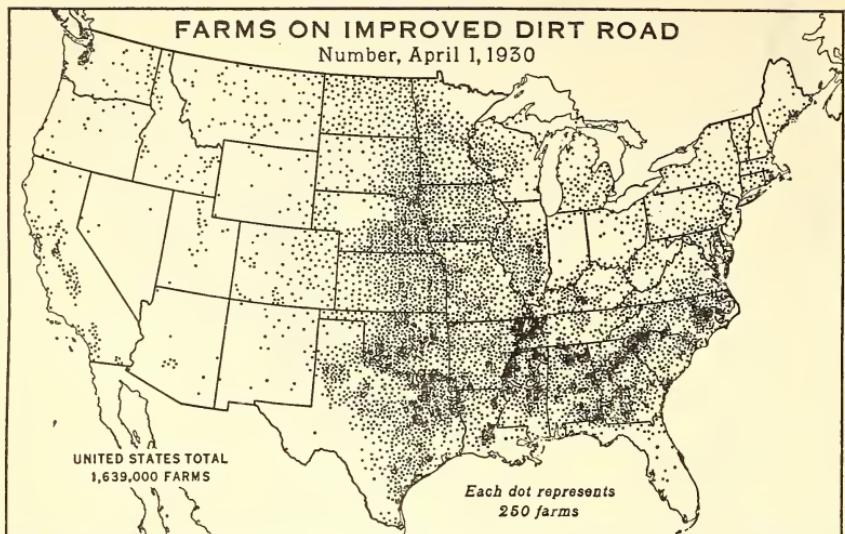
BAE31229

FIGURE 29.—Many more farms are located on gravel than on concrete or macadam roads, doubtless in part because gravel is a cheaper form of material. Twenty percent of all farms in the Nation were on gravel roads in 1930; a half or more in southwestern Ohio and central Indiana, and the proportion was almost as high in the Yazoo delta in Mississippi, in central Tennessee, in eastern Wisconsin, and in most of southern Minnesota and southern Michigan. The number of farms on gravel roads increased from 946,000 in 1925 to 1,279,000 in 1930 in the Nation as a whole.



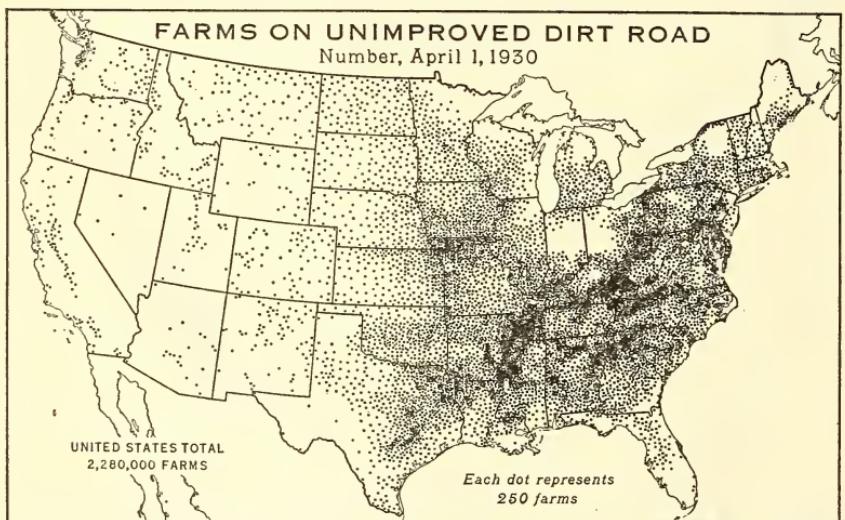
BAE31230

FIGURE 30.—The use of a mixture of sand and clay to make a road with fairly hard surface is most common in the South Atlantic States, extending westerly over the Coastal Plain, where both sand and clay are abundant, to Mississippi and Texas. A few such roads have been made in the northern cut-over portions of Michigan, Wisconsin, and Minnesota. This type of road construction is characteristic of the poorer sections of the country. In North Carolina 15.3 percent of all the farms were located on this type of road in 1930, and in South Carolina 16.1 percent.



BAE31231

FIGURE 31.—More farms adjoin improved (graded) dirt roads in the South than in the North, partly because there are more farms (including cropper holdings) in the South and partly because there is a much smaller mileage of hard-surface road. Improved dirt road is the common kind in most of the prairie region, extending from Illinois westward to Oklahoma, Kansas, and North Dakota. Almost one-fourth of the farms of the United States were located on improved dirt roads in 1930. The number decreased from 1,999,000 in 1925 to 1,639,000 in 1930.



BAE31232

FIGURE 32.—Unimproved dirt roads are the most common kind of road in the United States as a whole. Farms on such roads are very numerous in the South, in New York, Pennsylvania, Missouri, and Iowa—more than half the farms in northern Missouri and in southern and eastern Iowa in 1930 were on such dirt roads. On the other hand, in western Ohio and central Indiana almost every farm is provided with a hard-surfaced road. In the Nation as a whole the number of farms on unimproved dirt roads decreased from 2,748,000 in 1925 to 2,280,000 in 1930.

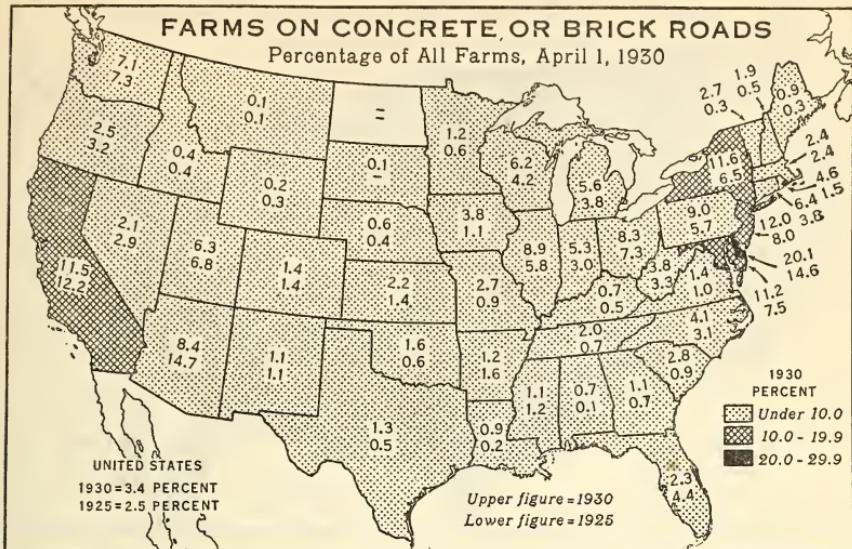


FIGURE 33.—In only five States were more than 10 percent of the farms located on concrete or brick roads in 1930. But several States were approaching 10 percent, and have doubtless passed this proportion since 1930. For the United States as a whole the increase was from 2.5 percent of all farms in 1925 to 3.4 percent in 1930. In most of the Southern States the proportion was below 2 percent in 1930, and this is also true of the Great Plains States. In the proportion of the farms on concrete roads the New England States fall behind the other Northeastern States.

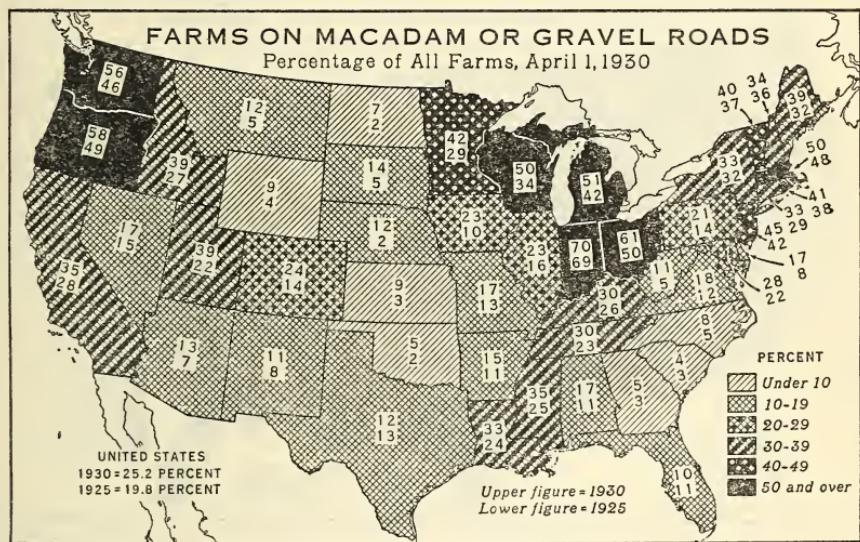
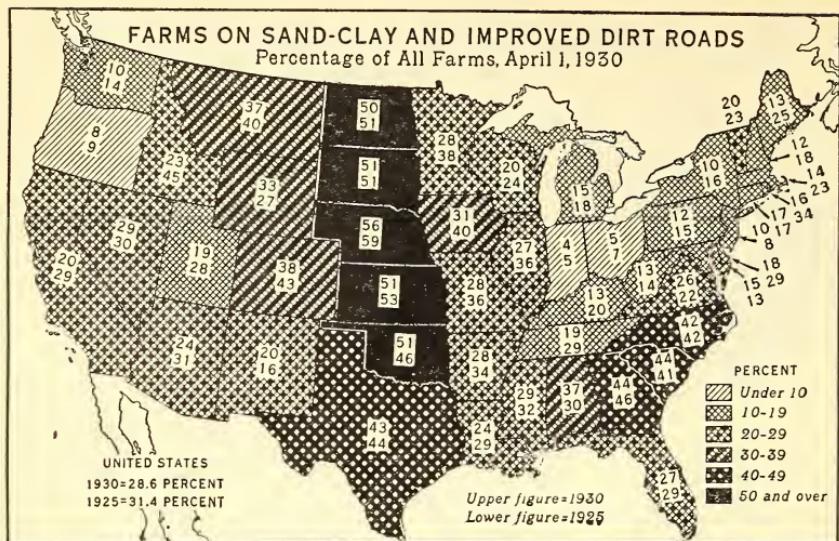
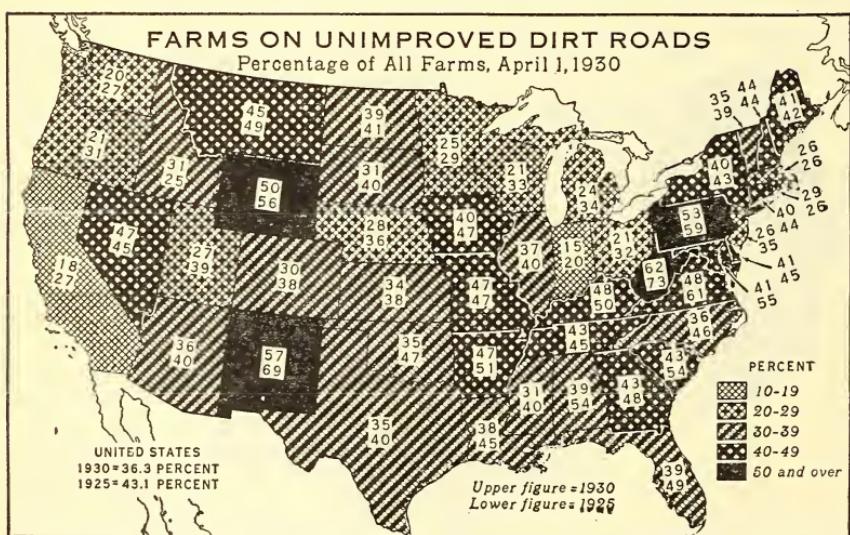


FIGURE 34.—One-half or more of the farms in Ohio, Indiana, Michigan, Wisconsin, Massachusetts, Oregon, and Washington adjoined macadam or gravel roads in 1930. In seven States, however, the proportion was less than 10 percent. Differences in State road policy, as well as in total expenditures for roads, are clearly indicated in this series of maps. Some States have provided most of the farmers with hard-surfaced roads, principally gravel, and other States have provided a smaller proportion of the farmers with higher grade roads, mostly concrete.



BAE31312

FIGURE 35.—Half the farms in the States from North Dakota to Oklahoma were on improved dirt or sand-clay roads in 1930 and a third or more were on such dirt roads, or the superior sand-clay roads, in the Carolinas, Georgia, and Alabama; also in Texas, Colorado, Wyoming, and Montana. In the industrial and mountain States from Tennessee and Michigan to Maine, the proportion of farms on improved dirt roads is small and declining. In the United States as a whole the number declined from 1,998,704 in 1925 to 1,795,485 in 1930 and the proportion declined from 31.4 percent to 28.6 percent



BAE31313

FIGURE 36.—Over one-third of the farms in the United States were located on unimproved dirt roads in 1930. The decrease was from 43.1 percent in 1925 to 36.3 percent in 1930. In four States the proportion still exceeded 50 percent; in two States, Indiana and California, it was below 20 percent. Rapid progress is indicated in the map above for most of the States in "getting the farmers out of the mud." At present, 1936, the proportion is doubtless less than one-third for the United States as a whole, and may be little more than one-quarter.

FARM EXPENDITURES

The expenditures by farmers for feed, fertilizer, labor (money wages only), machinery, and electric power totaled nearly \$3,000,000,000 in 1929, and taxes paid brought the figure up to about \$3,500,000,000. In addition there was an expenditure of over \$700,000,000 for interest and commissions on loans including mortgage debt. It appears, therefore, that these expenditures amount to fully a third of the farmers' gross income from farm production. When expenditures for livestock bought, for seed, spraying materials, containers, lumber (\$167,000,000 in 1924), and many other items are added, for which no census figures are available, it seems probable that these cash expenditures total about half of the farmers' gross income.

The expenditure for electric power was greatest in California, where power is extensively used to pump water for irrigation. But farmers are rapidly increasing their use of electric power in the Hay and Dairy Belt and in the Corn Belt. Expenditures for machinery were larger in the Corn Belt, in the Dairy Belt, and in the wheat regions than in other regions. The expenditure for feed was heaviest in the Northeastern States, where dairying is the dominant industry and is partly dependent on mill feed, grain, and linseed cake from the West, and cottonseed meal from the South. Much western grain is also used to feed poultry and work horses in this region. The heavy expenditure for feed in the California valleys and western Washington is for dairy cows and poultry principally. The expenditure for fertilizer is greatest in the South Atlantic States, extending northward on the Coastal Plain to New England. The fertilizer is used principally on the cotton and tobacco crops in the South, on tobacco and onions in the Connecticut Valley, and for the vegetable crops on the Coastal Plain from Norfolk, Va., to Boston, Mass. Outlying districts are the Aroostook potato district of Maine and the fruit and truck districts of Florida and California. The expenditure for labor is very heavy in these fruit-growing and trucking belts.

Thus it appears that farm expenditures are heaviest in the Northeastern States and California. In fact, many dairy and poultry farms in these areas approach manufacturing plants in character, transforming purchased feeds into finished products, with heavy expenditure for labor. In the Cotton Belt, on the other hand, the expenditure for labor is greatly reduced in the eastern part by means of the cropper and tenant systems, and expenditure for fertilizer in the western part is as yet insignificant. Nevertheless, there are many plantations in which expenditures for feed, fertilizer, labor, and lumber are all large. In the Corn Belt farm expenditures are lighter than in the North Atlantic States or in California, but heavier than in the South. The farms, especially in the prairie part of the Corn Belt, are large, and expenditures for labor, feed, machinery, and lumber are large per farm. There is little expenditure for fertilizer, but as the use of mineral fertilizer is slowly moving westward from the leached lands along the Atlantic coast into the areas of inherently more fertile lands in the Mississippi Valley, the expenditure for fertilizer in the Corn Belt is likely to increase. This increase is associated with the depletion of the organic matter and the supply of phosphorus, calcium, and other elements of fertility in the soil.

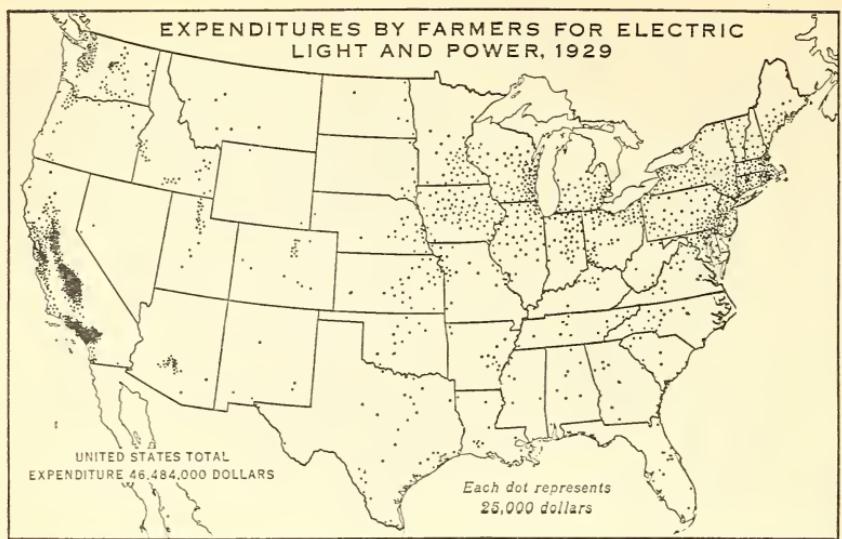


FIGURE 37.—The farmers of California spent one-half as much for electric power as was spent by all other farmers in the Nation, in 1929. Electric power in California is used principally in pumping water for irrigation. As with other forms of power and use of home conveniences, southeastern Pennsylvania and eastern Wisconsin stand out on the map. The farmers of the Corn Belt used much less electric power than those of the Dairy Belt, and the farmers of the Great Plains region and the Cotton Belt use still less—in many large areas no expenditure is indicated on the map.

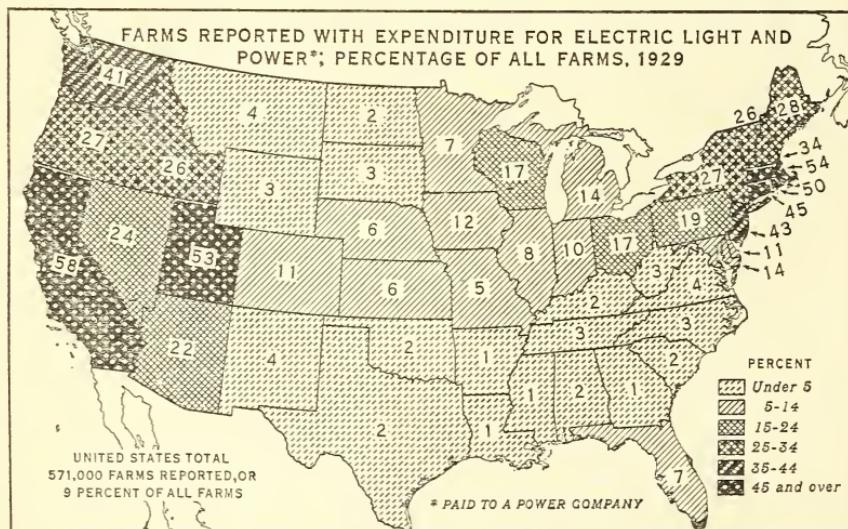
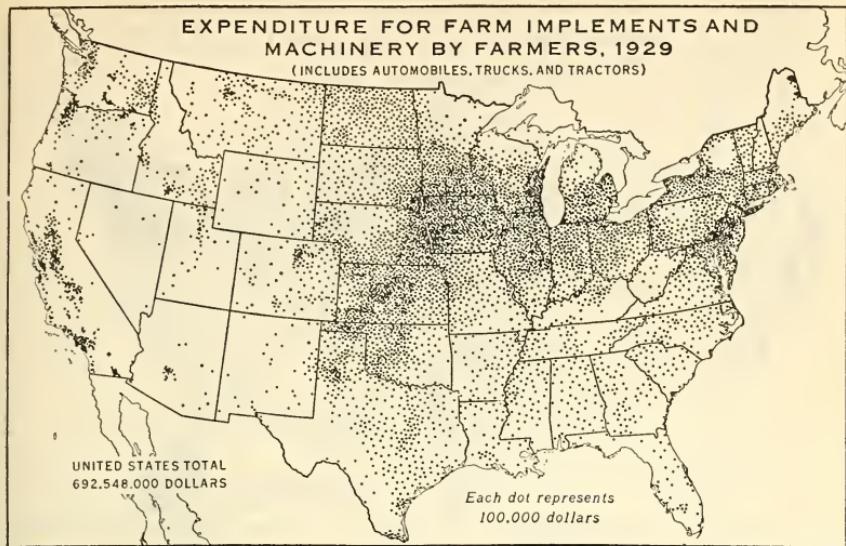
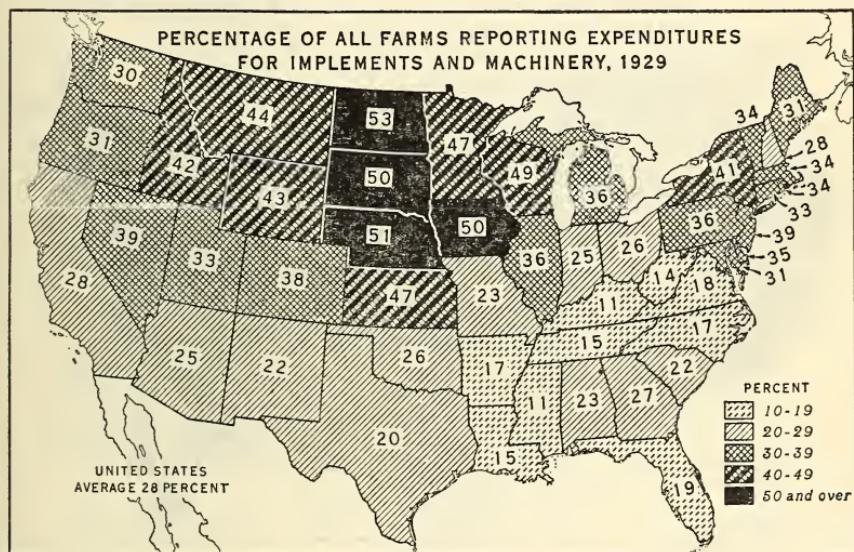


FIGURE 38.—As with most other home conveniences, the far Western and the Northeastern States have the largest proportion of farms reporting expenditures for electric power. More than half the farmers of California, Utah, and Massachusetts purchased electric power in 1929, and from one-fourth to one-half of the farmers in Washington, Oregon, Idaho, New Jersey, New York, Connecticut, Rhode Island, and northern New England, but in the Cotton Belt and in the Spring Wheat Belt, only 1 to 4 percent. The proportion of farms in the Nation purchasing electric power rose from 9 percent in 1929 to about 13 percent in 1936.



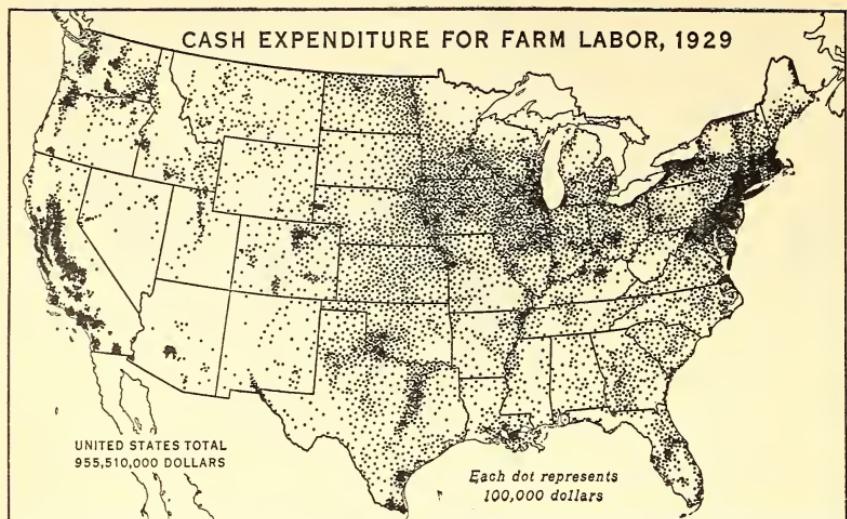
BAE31264

FIGURE 39.—About one-fourth of the expenditures in 1929 for farm implements and machinery were in the Corn Belt, one-fourth in the Hay and Dairy Belt, one-fourth in the Wheat Belts and the Grazing and Irrigated Crops Belt, and one-fourth in the remainder of the United States, namely, in the Corn and Winter Wheat Belt, the Cotton Belt, the Atlantic coast, the Gulf coast, and the Pacific coast belts. (See fig. 1, Miscellaneous Publication No. 260.) As heavy expenditures occurred in southeastern Pennsylvania, in the Ontario lowland of New York, and in eastern Wisconsin, as in Iowa and Kansas.



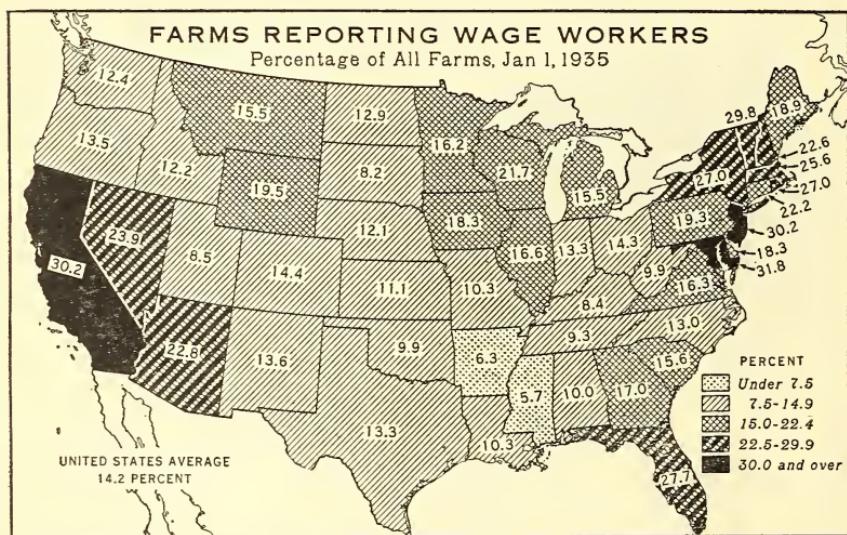
BAE29972

FIGURE 40.—Fifty percent or more of the farmers in Iowa, Nebraska, and the Dakotas purchased farm implements and machinery in 1929, nearly half in Wisconsin, Minnesota, and Kansas, and more than two-fifths in Wyoming, Montana, Idaho, and New York. These are grain-growing States, except Wisconsin and New York. By contrast, only 11 percent of the farmers reported such an expenditure in Kentucky and Mississippi. The States south of the Potomac and Ohio Rivers stand out on this as on many other maps, except that the proportions in South Carolina, Georgia, and Alabama are about as high as in Ohio, Indiana, and Missouri.



BAE31259

FIGURE 41.—The cash expenditure for farm labor in 1929 was greatest in the trucking, fruit-growing, and dairying areas, especially the Atlantic Coastal Plain and Piedmont from Maryland to Massachusetts, the western New York belt, and the irrigated sections of the West. Heavy expenditure was also general in the cotton sections of Texas and Oklahoma, in portions of the Corn Belt and the Spring Wheat Belt, and in the dairying sections of Wisconsin and New York. Cotton requires much hand labor, but money expenditure, as wages, is partly avoided by the use of share croppers and tenants.



BAE31534

FIGURE 42.—In California, Maryland, and New Jersey, characteristically truck- and fruit-growing States, 30 percent of all farmers reported expenditure for labor in 1929. In Florida, New York, Vermont, Massachusetts, and Rhode Island, also truck and fruit States (except Vermont), the proportions were almost as high. In New York and New England dairying is very important. In the wheat regions machinery reduced the proportion of the farms hiring labor to a range of 8 to 16 percent. In the Cotton Belt the labor was paid mostly with a share of the crop.

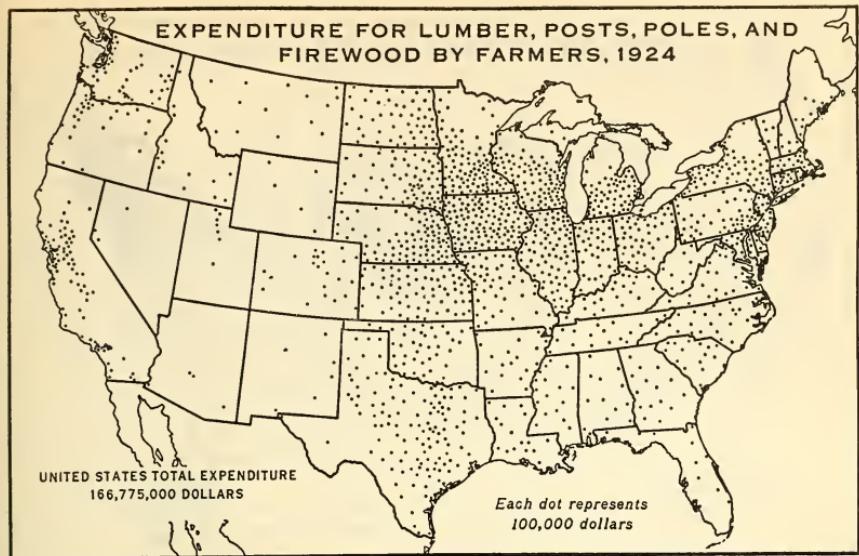


FIGURE 43.—Expenditure of farmers for lumber in 1924 was much less than for feed or labor, but nearly three-fourths as much as for fertilizer. The expenditure for lumber was heaviest in the Corn Belt, in the Hay and Dairy Belt, in the Wheat Belts, in Texas, in California, Oregon, and Washington. The lesser expenditure in the South is due not only to the milder climate that renders substantial houses and barns less necessary than in the North, but also to the smaller importance of livestock and the smaller wealth available for the construction of buildings.

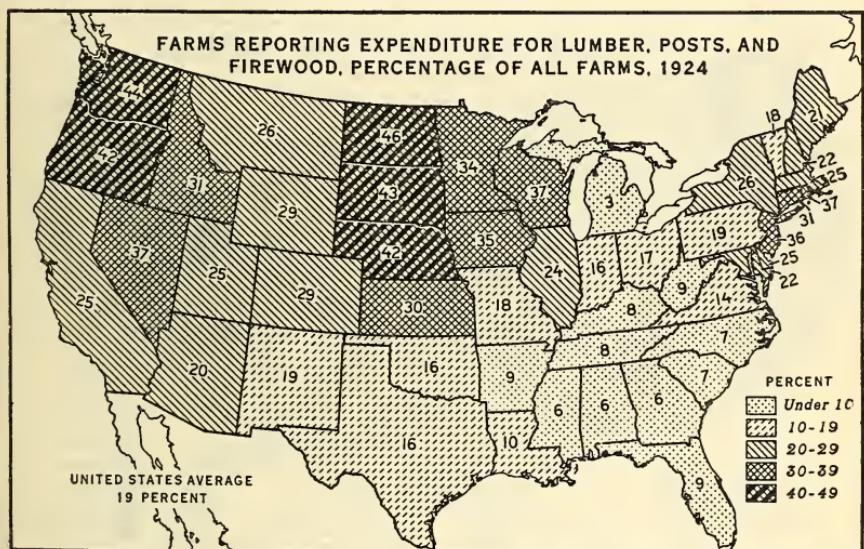
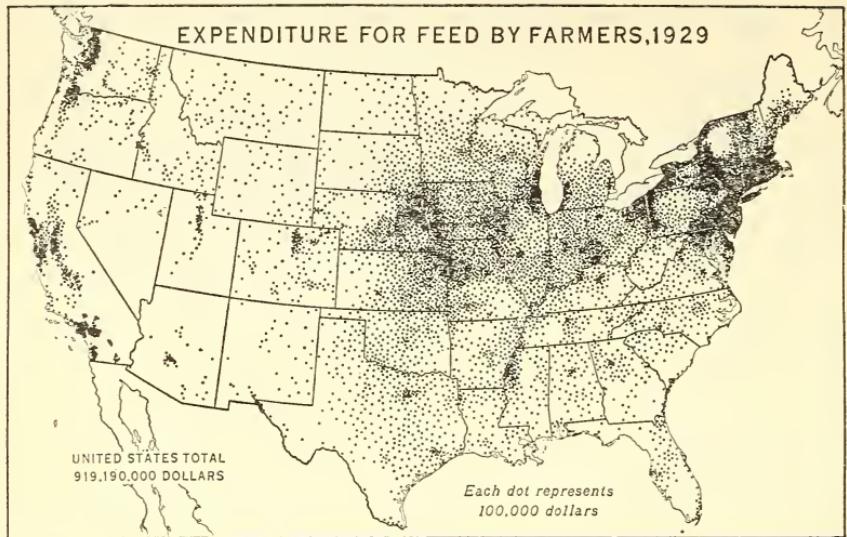
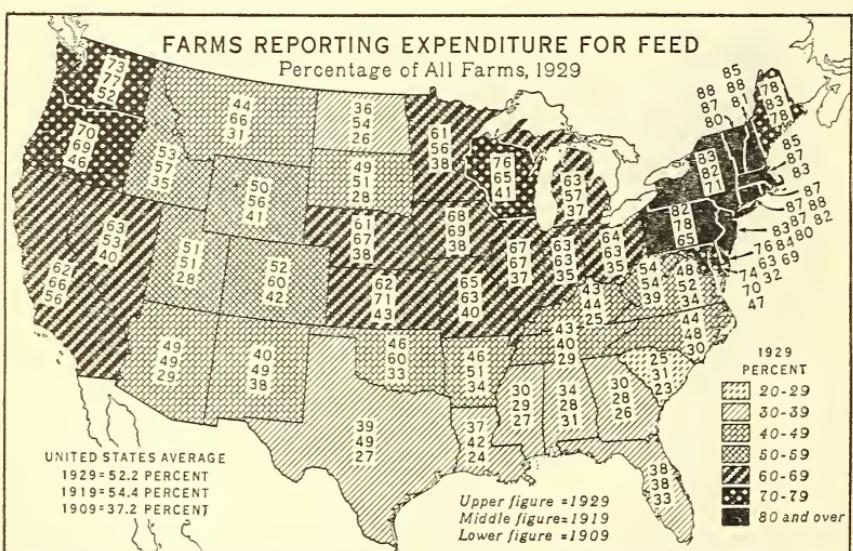


FIGURE 44.—The farmers of the United States are great users of wood. In addition to that which they grew, about one-fifth bought wood during 1924. The largest proportion bought wood in those sections where there is practically no woodland in farms—in the Dakotas and Nebraska and in eastern Washington and Oregon. The proportion was very large in Kansas, Iowa, Minnesota, Wisconsin, New York, New Jersey, and New England. In the South the proportions were low, partly because of the abundance of woodland and partly because croppers and tenants do not commonly buy lumber.



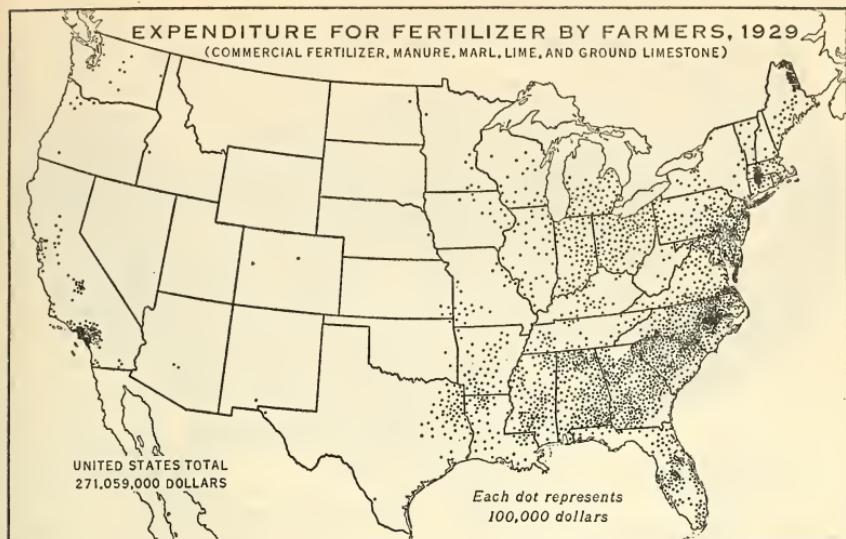
BAE31263

FIGURE 45.—The expenditure for feed is greatest in the Hay and Dairy Belt, especially the eastern portion, in southeastern Pennsylvania, in the Los Angeles and San Francisco Bay districts, and in western Oregon and Washington. In these areas dairying and poultry raising dominate, and the production of grain is deficient. There is also heavy expenditure in the Corn Belt, where feed is freely bought and sold by the farmers, most of whom raise cattle and hogs. In north-central Illinois much of the corn is sold and few cattle or hogs are raised.



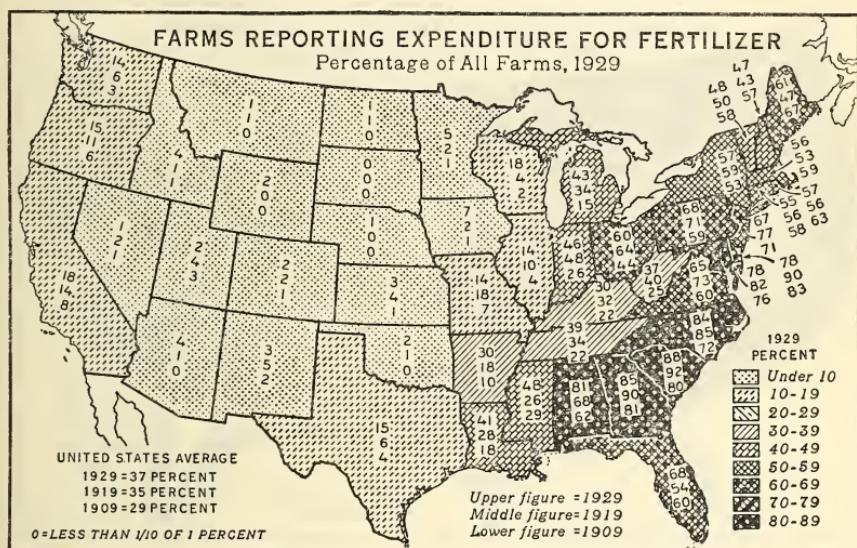
BAE29969

FIGURE 46.—In the North Atlantic States and Wisconsin, dairy States that feed more grain than they raise, three-fourths or more of the farmers bought feed in 1929. In Maryland, Washington, and Oregon, also dairy States, the proportion exceeded 70 percent. In the Corn Belt States, and in Michigan, Minnesota, California, and Nevada—all livestock States—the proportion varied from 61 to 68 percent. In the South and Southwest less than half the farms reported feed bought in 1929, and the proportion in nine of these States was lower in 1929 than in 1919.



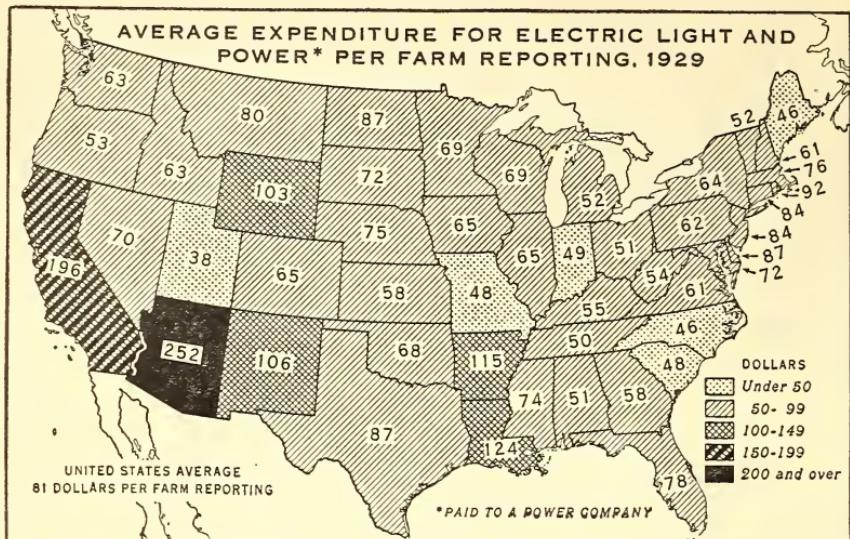
BAE24673

FIGURE 47.—Fertilizer is used at present principally on the more intensively cultivated crops, particularly cotton, tobacco, fruit, truck, and potatoes; and almost wholly as yet in the originally forested East and South, where the rainfall is heavier and the soils more leached, and in California. About one-half of the Nation's expenditure in 1929 occurred in the Coastal Plain and Piedmont portions of Alabama, Georgia, and the Carolinas. Significant and prophetic is the considerable expenditure shown in Ohio, Michigan, and Indiana, and even in Illinois and Iowa.



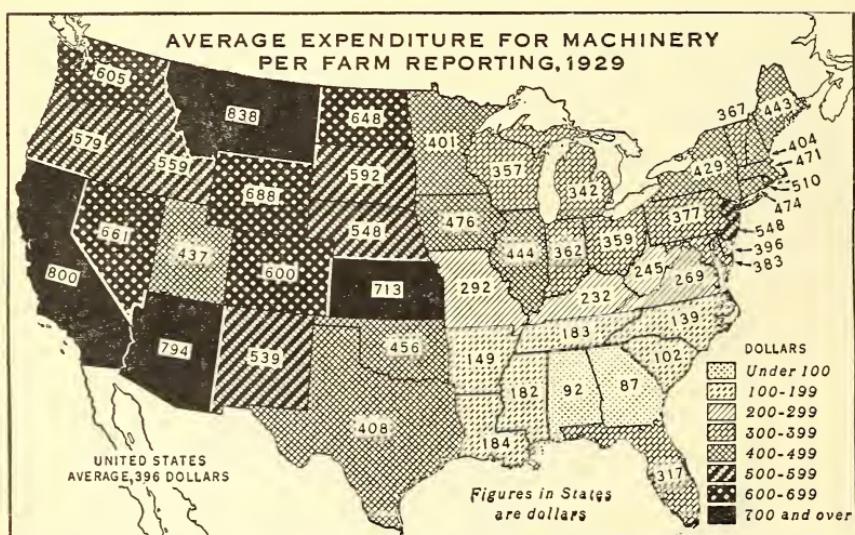
BAE24711

FIGURE 48.—Over 80 percent of the farmers in Alabama, Georgia, and the Carolinas bought fertilizer in 1929, and almost 80 percent in Delaware and Maryland. In Pennsylvania, New Jersey, Virginia, and Florida, about two-thirds bought fertilizer. In most of New England, New York, and Ohio, one half or more; and over 40 percent in Michigan and Indiana. The use of fertilizer is moving west from the forest onto the grassland soils. Although used mostly on crops that have a high value per acre, its use on general farm crops, even in the fertile Corn Belt, has proved to be profitable.



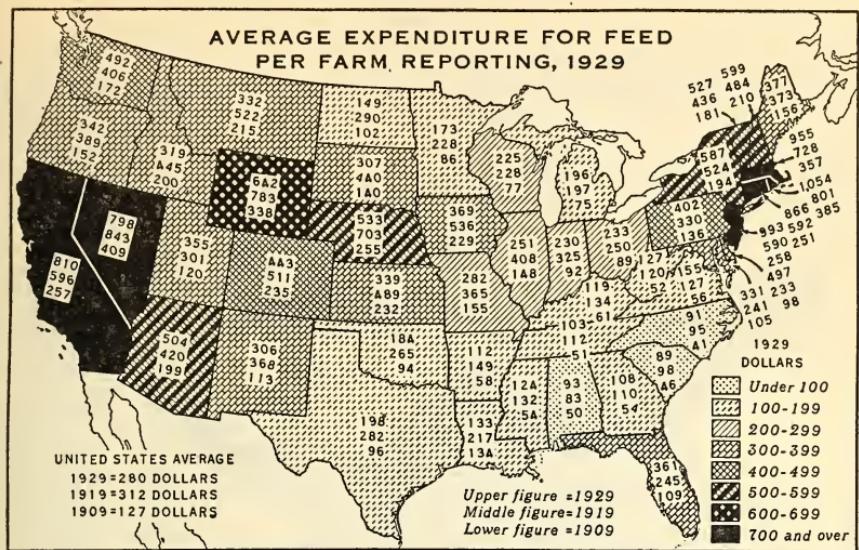
BAE31639

FIGURE 49.—The expenditure for power per farm reporting in California and Arizona, Louisiana and Arkansas, is large because many farmers use electric motors to pump water for irrigation. In most other States, the expenditure per farm ranges from about \$50 to \$75, but averages \$80 or more in the States from Delaware to Rhode Island, also in North Dakota, Montana, Wyoming, and New Mexico. It is less than \$50 in the Carolinas, Indiana, Missouri, and Utah. The price of power, as well as the quantity used, influences the expenditure per farm.



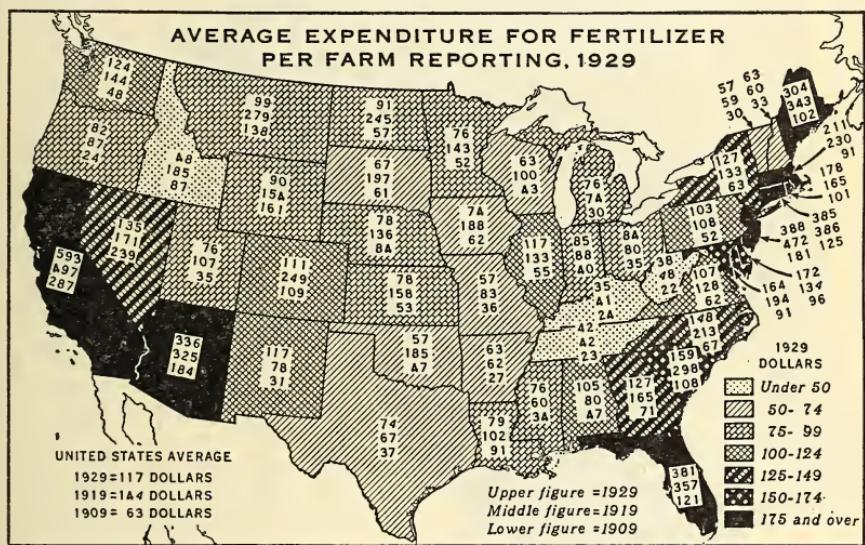
BAE29971

FIGURE 50.—The expenditure for machinery and implements per farm is smaller in the Eastern than in the Western States, where many farms are extensive and grain is grown, or other crops that are well adapted to the use of machinery. The expenditure is least in the eastern Cotton Belt, but it should be recalled that many farms in the South are small tenant holdings in plantations and that doubtless few of these tenants bought implements or machinery. About 28 percent of all farms in the United States bought machinery or implements in 1929.



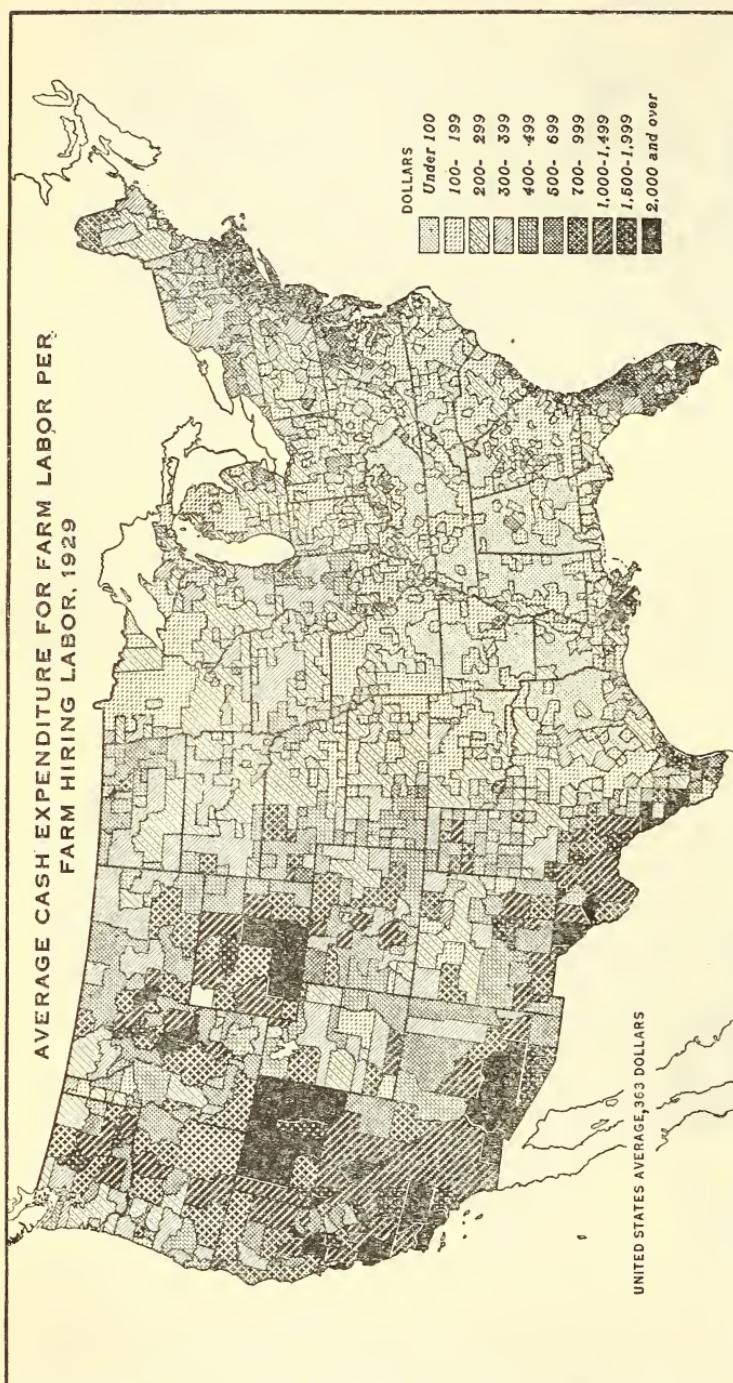
BAE29970

FIGURE 51.—Much feed is purchased by producers of milk and eggs for market in the Northeastern States. The average expenditure per farm reporting is about \$1,000 in New Jersey, Rhode Island, and Massachusetts. In California and Nevada, the average is nearly as high. In the Corn Belt the two-thirds of the farms that reported feed bought averaged from \$200 to over \$500 per farm in 1929. The decline in average expenditure for feed per farm in many States between 1919 and 1929 is the result principally, if not wholly, of decline in price of feed.



BAE31441

FIGURE 52.—The largest average expenditures for fertilizer per farm reporting are in the fruit and vegetable-growing districts of California, Arizona, and Florida, and in the trucking districts from Norfolk, Va., to Boston, Mass. In the eastern Cotton Belt the average is much smaller because the value of the products per farm is smaller, for there are many tenant and cropper holdings. The decrease from 1919 to 1929 was due in part to the decline in prices of fertilizers.



BAE29983

FIGURE 53.—Average cash expenditure for hired farm labor is influenced by type and area of farms, labor available, and non-agricultural wages. The latter are especially important in the North and East. Although the total expenditure for labor was high in the Northern States and in California (see fig. 41), the average expenditure per farm hiring labor was highest in several counties of the Grazing and Irrigated Crops Belt and near cities of the North Atlantic States. There are two reasons: (1) The large stock farms or ranches in the arid regions require large total expenditures for labor but small expenditures per acre, and (2) the large fruit and truck farms require much labor per acre. Labor costs are very low in the Southeast where farmers employ few laborers and wage rates are low.

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total, 1924.....	27	number, April 1, 1930.....	9
machinery, average per farm reporting, 1929.....	30	Telephones— farms reporting, number, April 1, 1930.....	16
Farm expenditures. <i>See</i> Expenditures, farm.	11	percentage of farms having 1 or more, April 1, 1930.....	16
Farm facilities— discussion—	11	Tractors on farms— number— increase, 1920-30.....	8
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Farm implements and machinery: <i>See</i> Imple- ments and machinery.	26	total, April 1, 1930.....	7
Farm labor, expenditures— cash paid per farm hiring, 1929.....	1-2	percentage of farms having 1 or more, April 1, 1930.....	7
total, 1929.....	32	Trucks, motor. <i>See</i> Motortrucks.	
<i>See also</i> Wage workers.	26	Wage workers, farms reporting, percentage of all farms, January 1, 1935.....	26
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<i>See also</i> Automobiles; Electric motors; Imple- ments and machinery; Motortrucks; Stationary gas engines; Tractors.	1-2	percentage of farms reporting dwellings, April 1, 1930.....	15
		Water piped into bathroom, farms reporting— number, April 1, 1930.....	14
		percentage of farms reporting dwellings, April 1, 1930.....	14

