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TYPES OF FARMING IN MISSOURI.

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University of Missouri, Agricultural Experiment Station, in cooperation with Bureau of Agricultural Economics, United States Department of Agriculture.

COLUMBIA, MISSOURI

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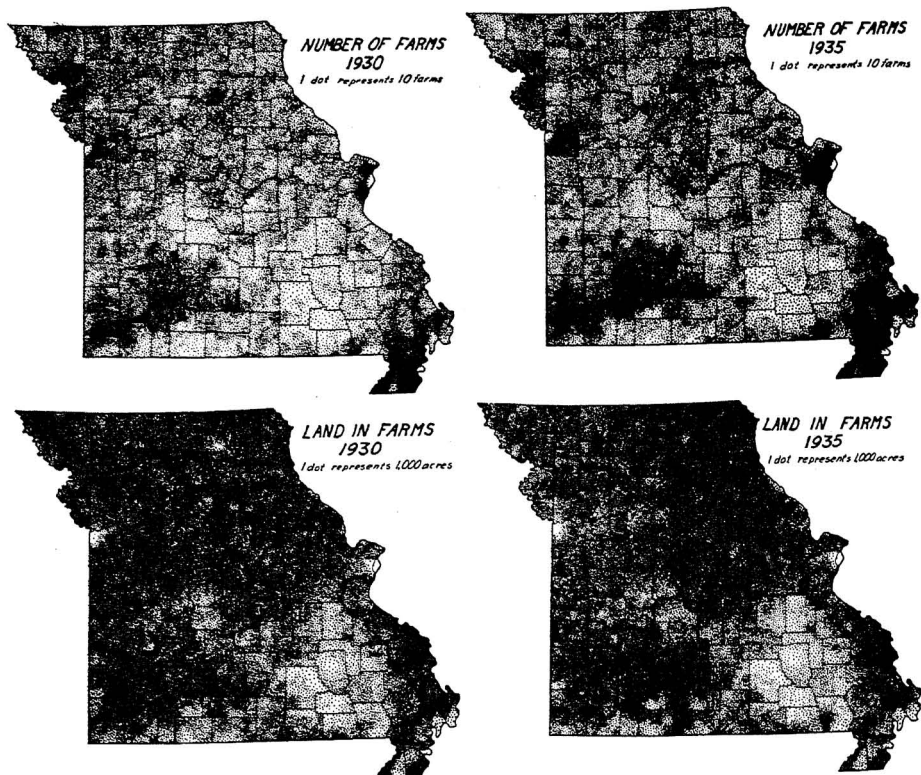


Fig. 1.—There is a concentration of farms in the southeastern lowland, in the southwestern part of the state, and near the cities. The acreage of land in farms shows a more even distribution, but areas of lesser density are noticeable near the cities and in the Ozarks. The percentages, which farm land represents of the total land area, are much smaller in the Ozarks and near the cities than elsewhere.

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INTRODUCTION

The types of farming in Missouri are the result of the interaction of physical, economic, biological, and social forces. The action of these forces has not been uniform in all parts of the state. For this reason the types of farming in different parts of the state either are not the same, or the relative proportions of farms of different types change. This lack of uniformity gives rise to areas of dominance of one type or another. Areas classified on the basis of dominance of types of farming are called type-of-farming areas.

Until recently, data have not been available on the number of farms of different types in the state or the organization of farms of the different types. In the reports of the 1930 Federal census of agriculture, all farms in the United States were classified on the basis of sources of gross income, and other descriptive data were tabulated according to type of farm. Heretofore only the general picture of land use and numbers of livestock in political subdivisions was available. This additional detail has made possible the type of study here presented.

The treatise which follows will describe the agriculture of the state of Missouri, first, in its more general aspects, and second, with respect to types of farming, taking account of the relative importance, location, and the homogeneity within the area of each type. The more pertinent of the causal factors dictating the types of farming and the type-of-farming areas will also be referred to and commented upon.¹

FARM LAND USE

Land use is a most important determinant of the type-of-farming and a description of the major aspects of such use will, therefore, contribute materially to an understanding of the agriculture of the state. For the sake of perspective, past as well as present use will be considered.

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¹The study herein presented has been made designedly descriptive and the analytical aspects, while not neglected, have been held to a secondary role. Succeeding studies to supply this background of cause and effect have been planned.

Present

The study of the present use of the land of the state may be divided into two parts: (1) a study of the general land use involving the larger subdivisions such as harvested crops, idle and fallow land, pasture, woodland not pasture, and other farm land, and (2) a study of the harvested crops individually.

General Land Use.—The location of Missouri's farms is shown in Figure 1. The dot maps, Figures 1, 2, and 3, and Table 1, show certain customary subdivisions of the farm land. Missouri's land surface is not taken for farms in uniform fashion and the land area of the Ozarks in southern Missouri, as Figure 1 makes clear, is less fully used for farms than are the northern, western and extreme southeastern portions of the state. Most land not in farms in Missouri is too rough or stony for agricultural use, but a considerable acreage in Southeast Missouri still needs drainage before it can be safely developed. A small part is also either held by timber companies or used for mining, industrial, residential or other urban uses. These latter uses are important in Jackson and St. Louis counties. (Table 1.)

TABLE 1.—DISTRIBUTION OF MISSOURI'S FARM LAND¹

Item	Land use in	
	Acres	Percent
Harvested crops	13,175,947	39.1
Idle, fallow or failure	2,470,325	7.3
Total crop land	15,646,272	46.4
Plowable pasture	7,017,663	20.8
Woodland pasture ²	5,261,642	15.6
Other pasture	2,017,431	6.0
Total pasture land	14,296,736	42.4
Woodland not pasture	2,438,358	7.2
Other farm land	1,361,553	4.0
Total farm land	33,742,919	100.0

¹Fifteenth Federal Census, 1930.

The distribution of crop land (land in harvested crops plus the idle, fallow and failure) representing almost one-half of all farm land, (Table 1) coincides with that of farm land for the most part (Fig. 2). The largest acreages of harvested crops (relatively) are in the southeastern lowlands, and the smallest in the Ozark highland. Over the entire Ozark area, approximately one-third of the state, the acreage of harvested crops is distinctly less in proportion to total land area than it is in other parts of the state.

The pasture land acreage in farms in the state is slightly less than that in crops, (Table 1). Pasture tends to be associated with crop land, but the proportion of the two varies from area to area. The relative amount of pasture land is, for instance, particularly great

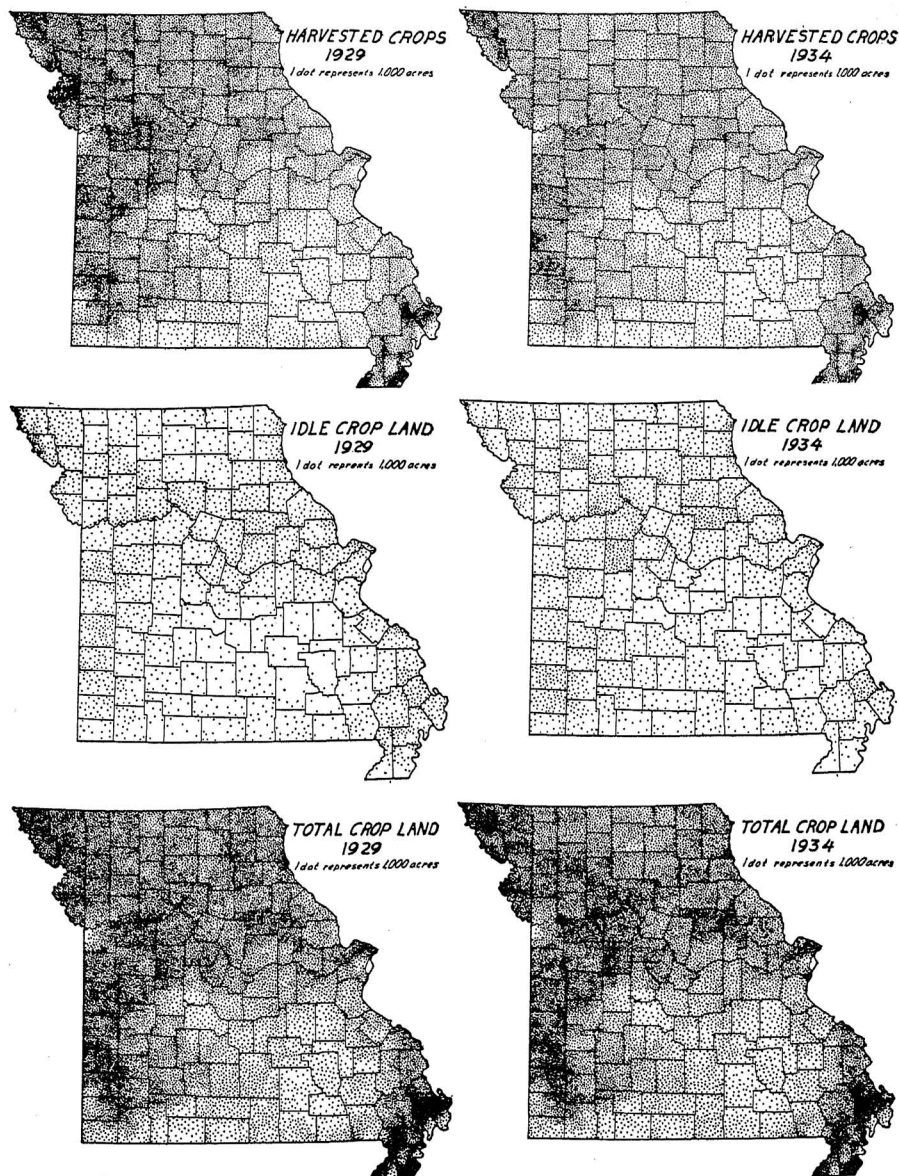


Fig. 2a.—Harvested crops, idle crop land, pasture, woodland not used for pasture, and all other farm land are somewhat variously distributed in different parts of the state.

in the south central section centering about Wright county. The distinct absence of pasture in farms in the southeastern Ozark counties gives an erroneous impression of the importance of pasture in

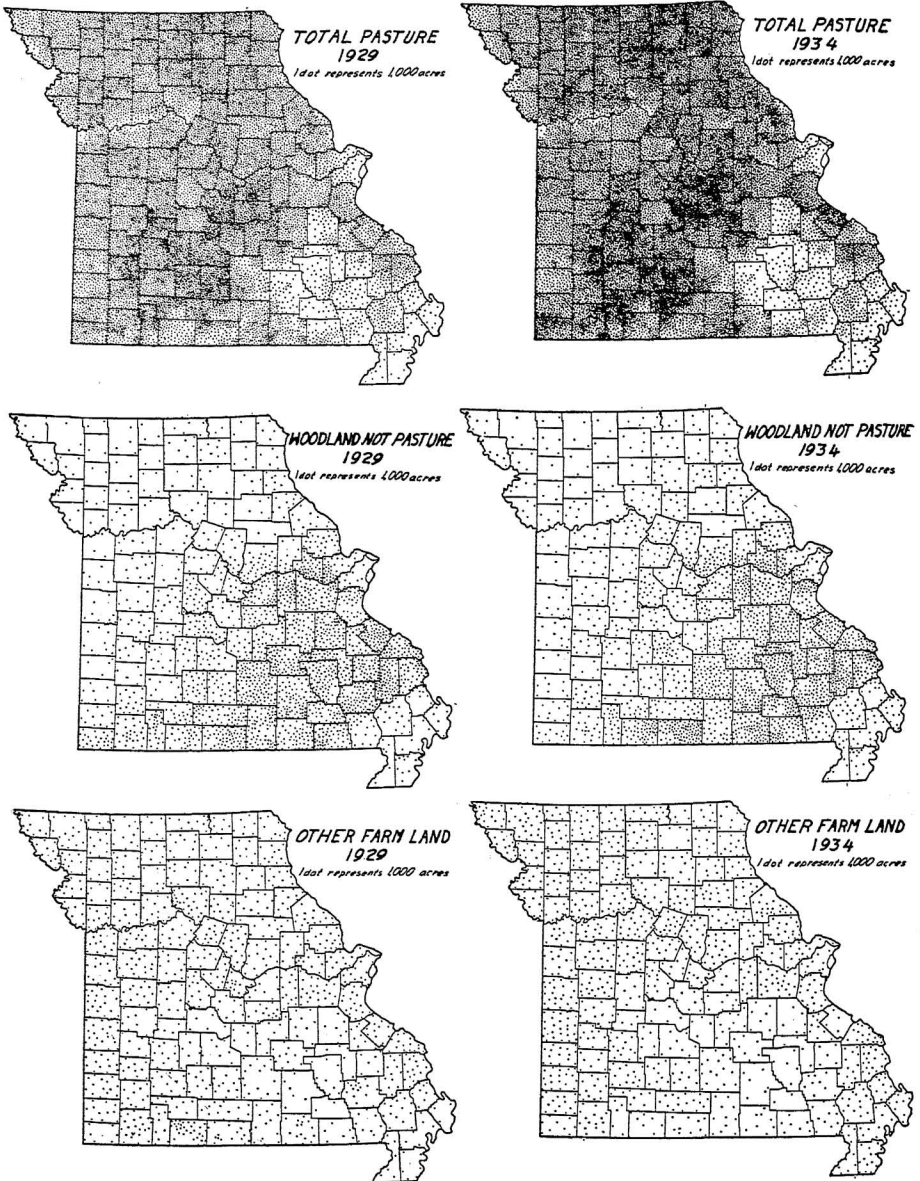


Fig. 2b.—Harvested crops, idle crop land, pasture, woodland not used for pasture, and all other farm land are somewhat variously distributed in different parts of the state.

this area. Much of the land in these counties is pastured as open timber range in non-farm ownership, and pasture as a form of land use is, therefore, much more important than the number of dots

indicates. In the lowland counties of the extreme southeastern part of the state, however, the absence of pasture acreage is accurately presented in the map. Pasture acreage is of relatively small importance along the bottom lands of the Mississippi and Missouri Rivers, particularly in northwestern Missouri.

Woodland which is not used for pasture, amounting to a trifle over 7 per cent of all farm land, is most prominent in the Ozark area in southern Missouri, and its presence here explains the absence of crops and pasture in farms in this area. Some woodland, not pastured, is found in the counties adjoining the Ozark area, but little is reported for the northern, and most of the western parts of the state.

The land classed as "other farm land," making up but 4 per cent of the farm area, is rather evenly distributed. "Other farm land"

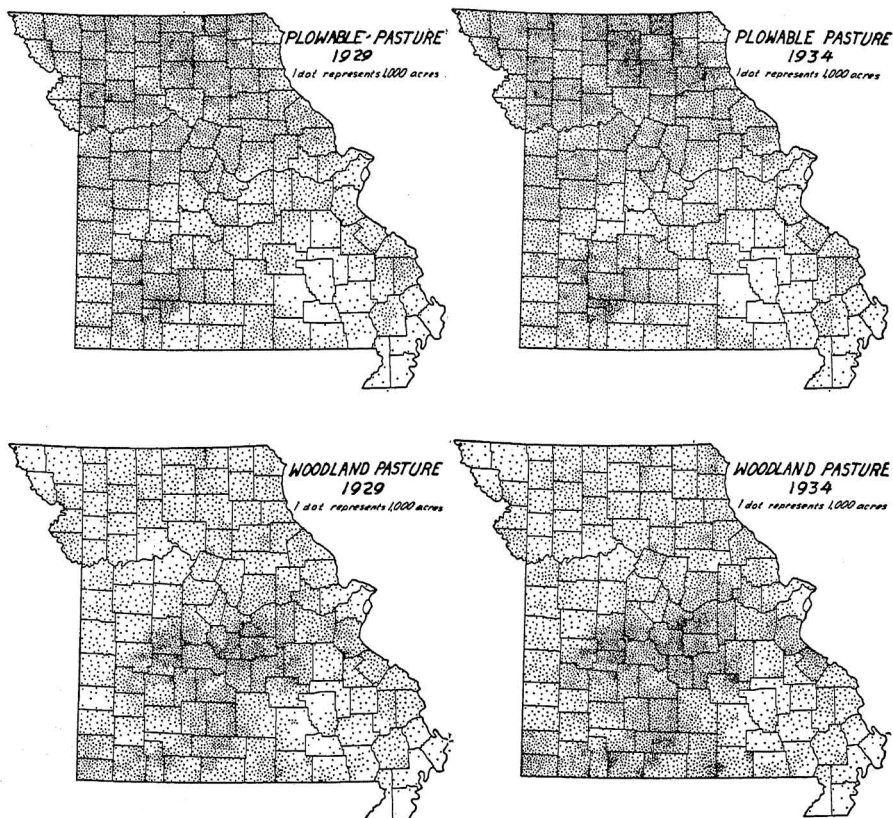


Fig. 3a.—The distribution of plowable pasture, woodland pasture, other pasture, and total woodland is not uniform for different parts of the state.

is land apart from that reported as crops, pasture, and woodland not pastured and includes the land in lanes, building sites, and other odd spots. The land that is too rough or too stony for the uses already given falls into this classification also.

Figure 3 shows the three major subdivisions of the total pasture area. Plowable pasture (20.8 per cent of the farm land) is more important in the northern part of the state and in a group of counties centering about Greene and Christian counties in the southwestern part. The southeastern half of the state reports considerably less plowable pasture, but much more woodland pasture, as is to be expected in an area where topography is less favorable for cropping. The acreage of woodland pasture in farms (15.6 per cent of farm area) is greatest in the Ozark border counties and least in the counties centering about Reynolds, Iron, and Wayne, where open

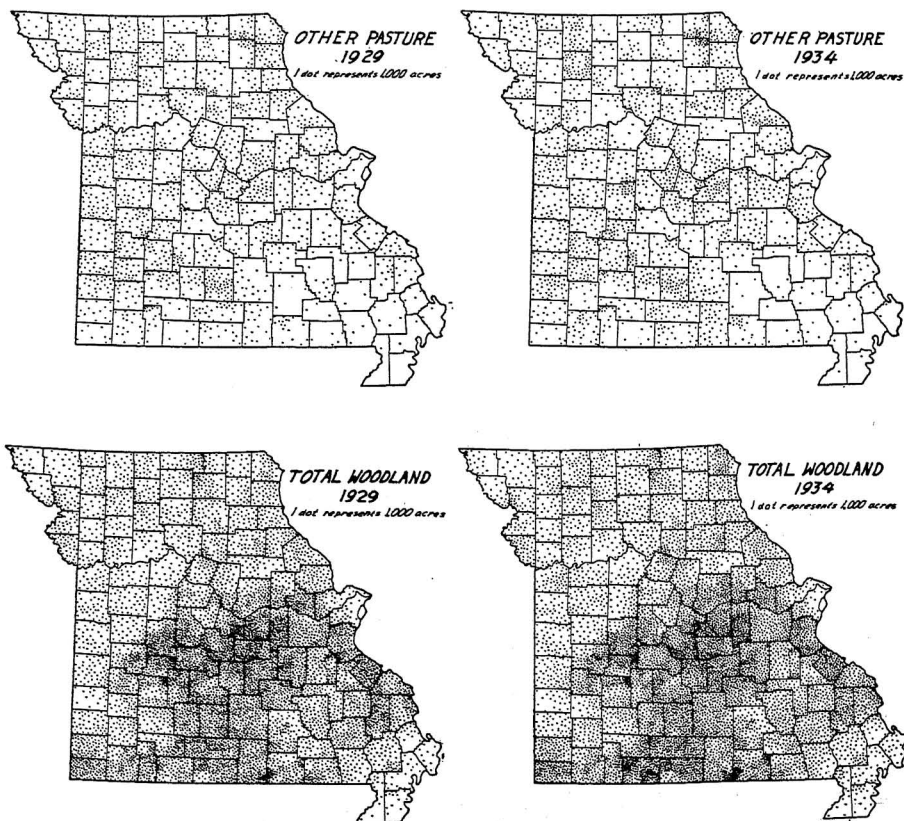


Fig. 3b.—The distribution of plowable pasture, woodland pasture, other pasture, and total woodland is not uniform for different parts of the state.

range in the timber in part takes its place. Southeastern lowland counties and counties in the northern part of the state report but little woodland pasture. Acreages of land classed as other pasture (6 per cent of farm area) are nowhere very great.

The location of the acreages of total woodland in farms, (composed of woodland pasture 15.6 per cent, and woodland not pasture 7.2 per cent, or 22.8 per cent of all farm land) is also given in Figure 3. Woodland in farms, for the state as a whole, amounts to the large total of 22.8 per cent of all farm land, and is considerably higher in the Ozark counties, reaching almost 60 per cent in Carter county.

Land in Crops.—The distribution of the major crops of Missouri is shown in Figures 4, 5, 6, and 7, while the relative proportion of each for the year 1929 is given in Table 2.

TABLE 2.—SPECIFIED CROPS OF MISSOURI¹

Item	Absolute Area	Land use in	
		Percentage of	
		Farm Land	Harvested Crops
	Acres	Percent	Percent
Corn	5,556,045	16.5	41.9
Wheat	1,533,531	4.5	11.5
Oats	1,383,500	4.1	10.4
Cotton	352,899	1.1	2.7
Soybeans	277,410	.8	2.1
Fruit	166,548	.5	1.3
Sorghum	119,311	.4	.9
Cowpeas	63,861	.2	.5
Potatoes	59,345	.2	.4
Other small Grains ²	44,520	.1	.3
Vegetables for sale	37,503	.1 ⁴	.3
Tobacco	5,039	—	.1
Total Crops other than Hay	9,609,512	28.5	72.4
Timothy & Clover Hay	2,456,137	7.3	18.5
Clover Hay	367,808	1.1	2.7
Alfalfa Hay	145,714	.4	1.1
Other Hay	701,046	2.1	5.3
Total Hay	3,670,705	10.9	27.6
Grand Total All Crops³	13,280,217	39.4	100.0

¹15th Federal Census. ²Includes barley, rye and mixed grains. ³Summation of Specified Crops amounting to 39.4% of total farm land instead of Census, 13,175,947 acres = 39.1% of total farm land. This is due to duplication of Crop land reported. ⁴Less than .1 percent.

Corn though present in every county (Fig. 4) is grown to a much larger extent in the northern, northwestern and extreme southeastern parts of the state than in the central and southern parts. Occupying over 5½ million acres, corn is grown on a larger proportion of the crop area than any other single crop, (42 per cent) (Table 2). Hay, its nearest competitor, occupies only slightly over 3½ million acres (28 per cent). Oats, on about one-fourth the land area in corn, are relatively prominent in northeastern Missouri and west central Missouri, but practically absent in southeastern Missouri. The wheat acreage is a slightly larger area than the

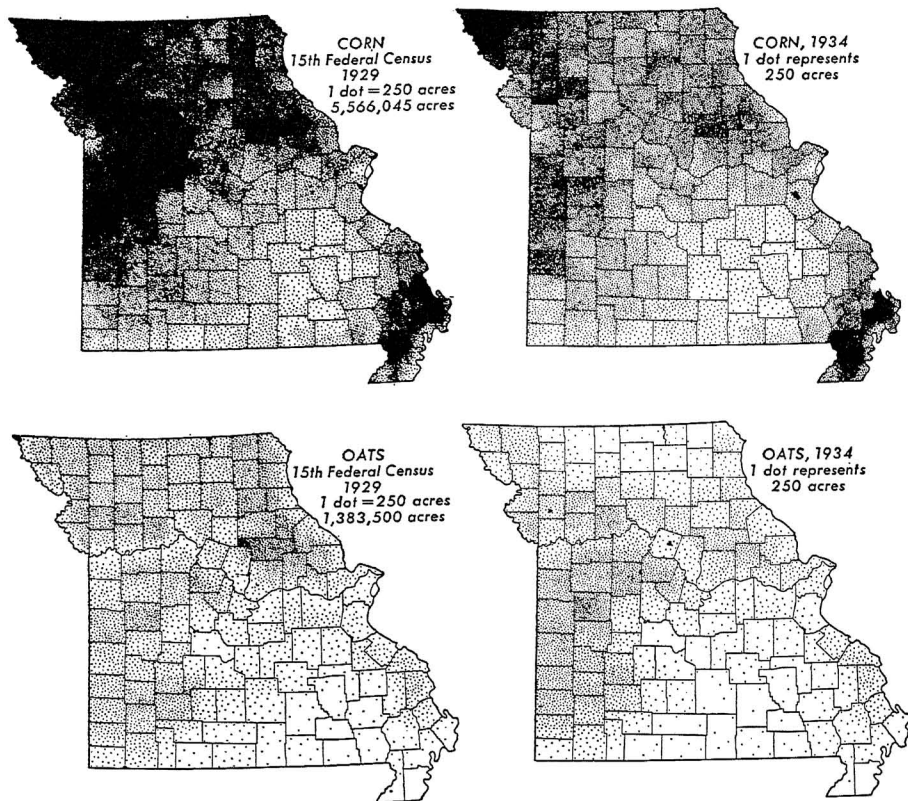


Fig. 4.—Corn is concentrated in the northwestern, western, and southeastern parts of the state. Oats appear to have several areas of density and wheat is concentrated along the rivers, and in southwestern Missouri. (Continued on opposite page.)

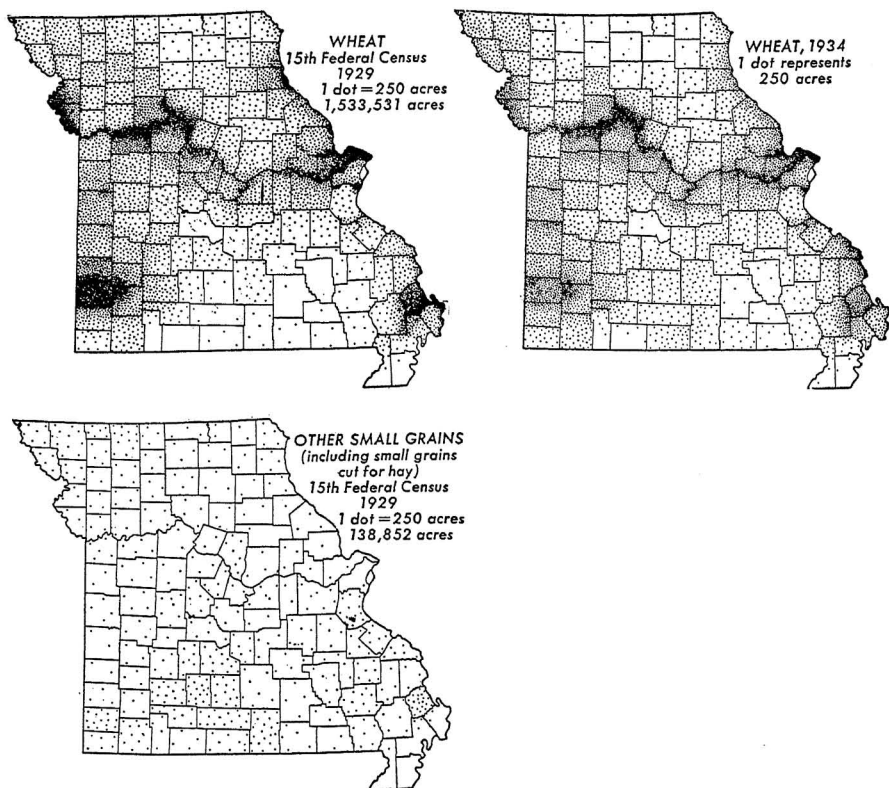


Fig. 4 (Continued).—Other small grains are not on a total area basis highly important, relative to the major grains.

oats acreage and is most heavily concentrated in western Missouri and along the Missouri and Mississippi Rivers. It is a striking fact that the four crops—corn, oats, wheat and hay—occupy 91.4 per cent of all crop land, leaving but 8.6 per cent for the various other crops.

Soybeans (Fig. 5) center in a belt extending from the northeastern corner of the state to the southwestern corner and in a few counties in southeastern Missouri. They occupy 277,000 acres (Table 2). Cowpeas on an area about one-fourth as large as that in soybeans, are found exclusively in southeastern and southwestern Missouri. Sorghums, occupying 119,000 acres, are prominent in southwestern Missouri only.

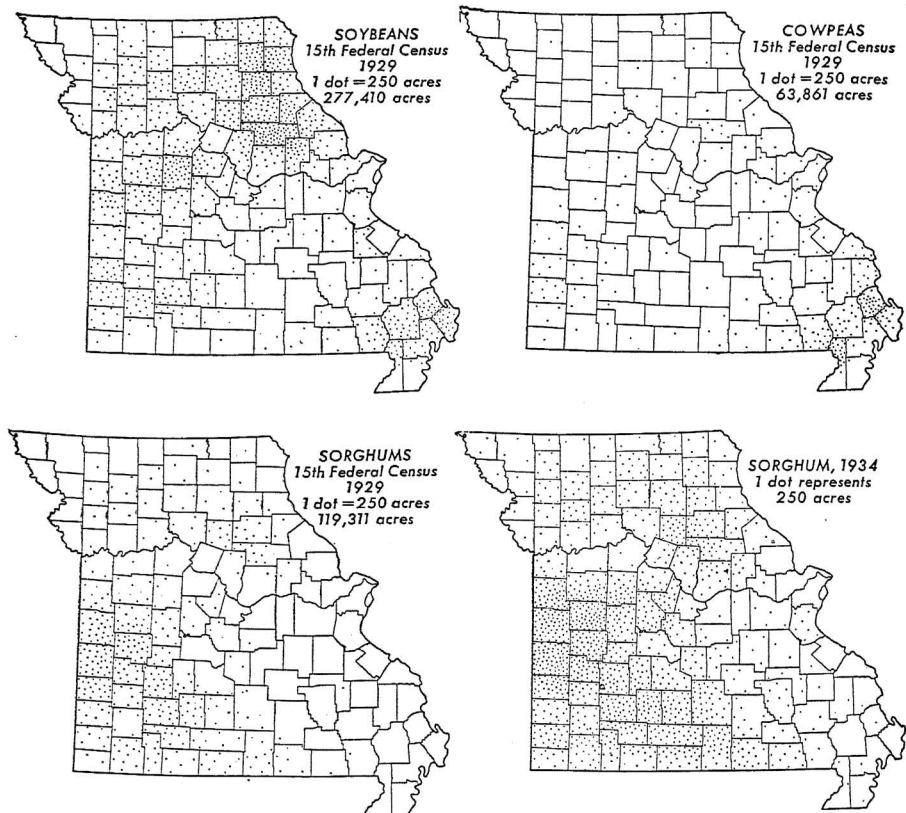


Fig. 5.—Soybeans are important in northwestern, southwestern, and southeastern Missouri, sorghums in southwestern Missouri, and cowpeas in southeastern Missouri.

The combined hay crops, occupying slightly over $3\frac{1}{2}$ million acres, equal to about two-thirds the area in corn, (Fig. 6, Table 2) appear to be more prominent in north central Missouri, although central and west central Missouri also report considerable hay. The southeastern lowland reports but little hay.

The differences in the various types of hay are important also, (Fig. 6, Table 2) the mixed hay, timothy and clover, occupying $2\frac{1}{2}$ million acres, or about two-thirds of the total, being concentrated largely in northern and northeastern Missouri, with a second center in the south central part of the state. The clovers are more important on an area basis in northwestern Missouri, near the major cities, in a few of the Missouri River counties and in some of the southwestern counties, notably Greene and Lawrence. The absence of clover in the southeastern and northeastern counties is

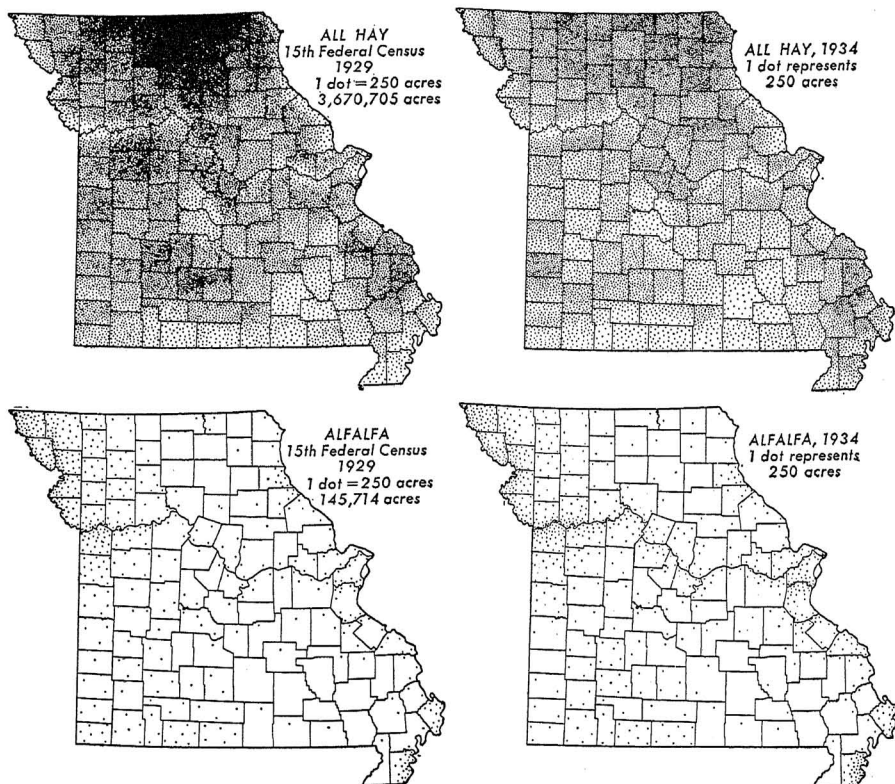


Fig. 6.—The relative lack of hay in the Ozarks and southeastern Missouri is particularly noticeable. Alfalfa is more important near the cities and in northwestern Missouri. (Continued on next page.)

particularly noticeable. Alfalfa is grown mostly in northwestern Missouri and near the two larger cities, Kansas City and St. Louis. The total acreage in alfalfa is less than 150,000.

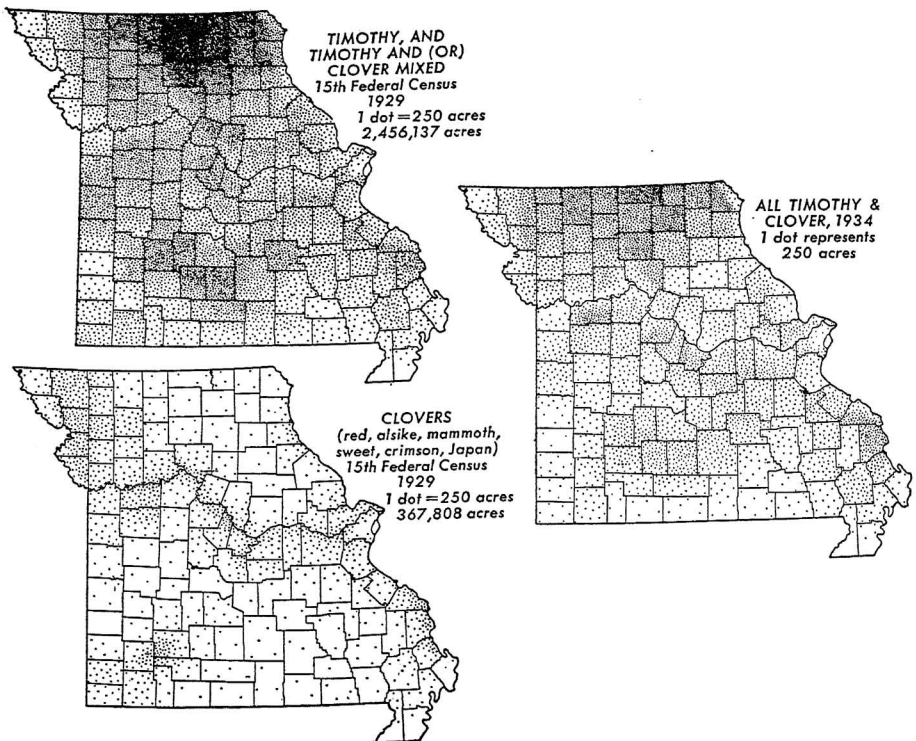


Fig. 6 (Continued).—Acreages of timothy and clover are large in northern Missouri, and to some extent in southwestern Missouri also. The clovers are concentrated along the two major rivers and southwestern Missouri.

Cotton on 353,000 acres represents an unusually fine example of local concentration, being found primarily in southeastern Missouri on the lowlands adjacent to the Mississippi River (Fig. 7, Table 2).

Tobacco, totaling about 5,000 acres, (about one-tenth of one per cent of the area in corn) is prominent only in Platte and a few other Missouri River counties, although practically every county in the state reports a few acres probably grown for home use (Fig. 7, Table 2).

Vegetables for sale (truck crops) on 375,000 acres are located mostly near the large cities and in southwestern Missouri (Fig. 7, Table 2). Land in orchards, vineyards and planted nut trees (167,000 acres) is concentrated near the cities and in southwestern Missouri also.

These maps and data reveal the differences in farm land use in Missouri and indicate the shifting emphasis upon crop enterprises that occurs from place to place.

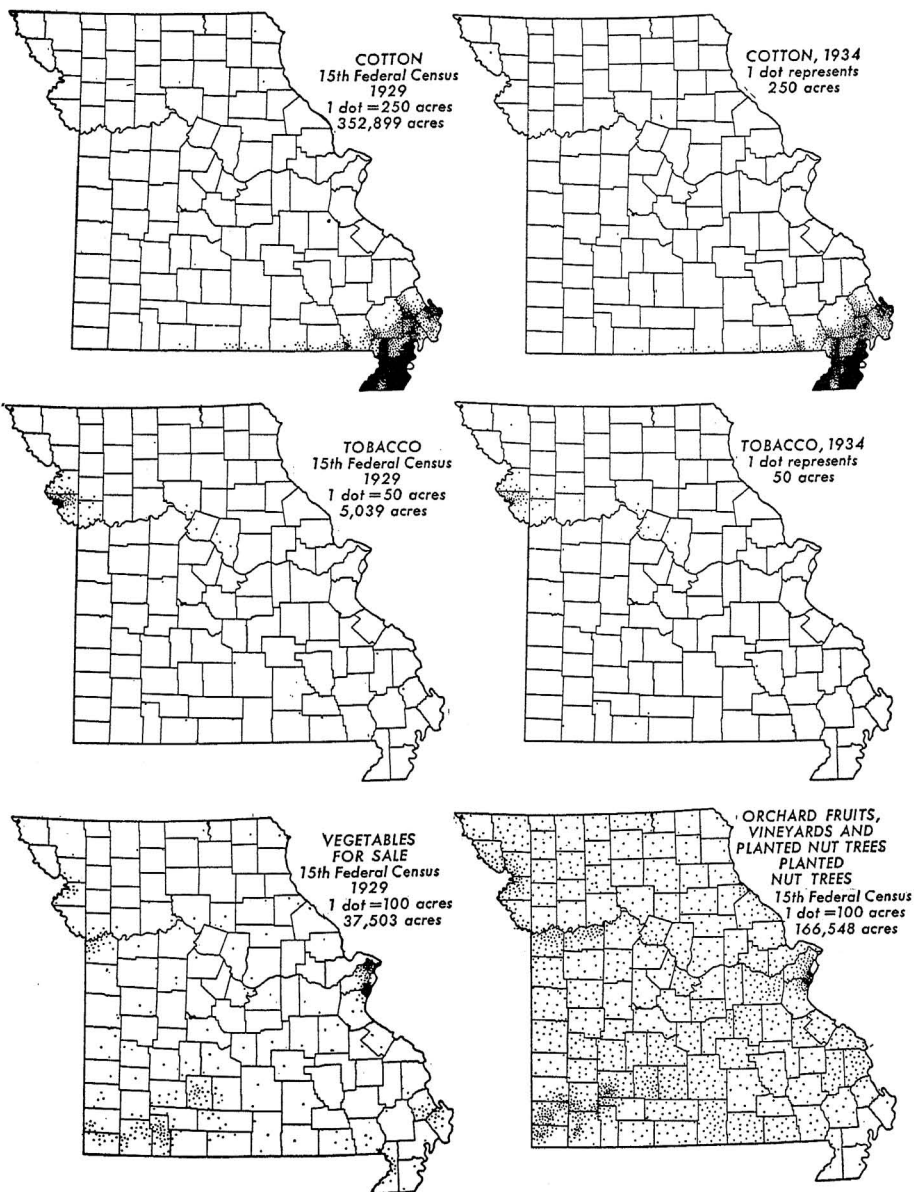
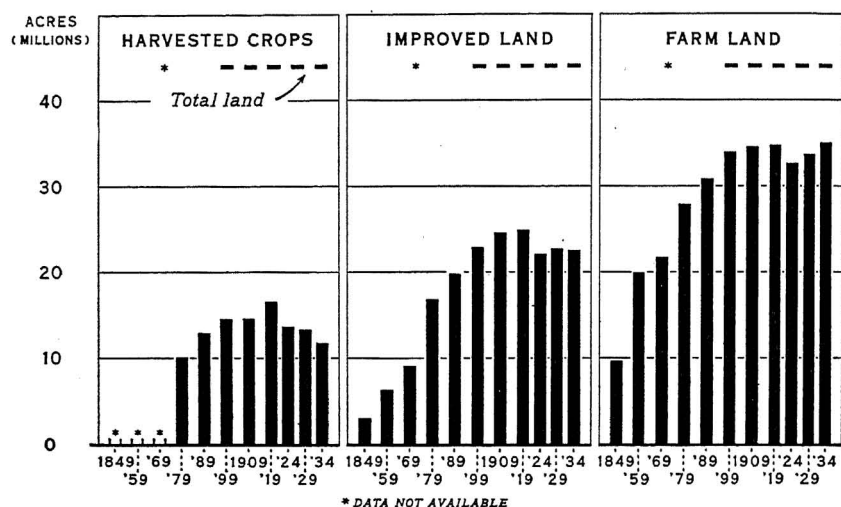


Fig. 7.—Cotton is concentrated in southeastern Missouri, tobacco near Kansas City, vegetables for sale near the cities and in southwestern counties. Orchard, vineyards, and planted nut trees are densest in the same areas as the vegetables for sale.

Past

The preceding section dealt with present day (1929) use of land in Missouri, considered from the standpoint of its general aspects and from that of specific crops. Farm land use of the past will be considered from the same standpoints.

General Land Use.—The use made of Missouri farm land has varied from time to time as Figure 8 reveals. From 1849 to 1899 Missouri's farm land area increased at a rapid rate. The more gradual increase from 1899 to 1919 was followed by an actual de-



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Fig. 8.—There was an increase in the acreage of farm land and its component parts, improved land and harvested crops, until 1919 and a decrease between that year and 1929.

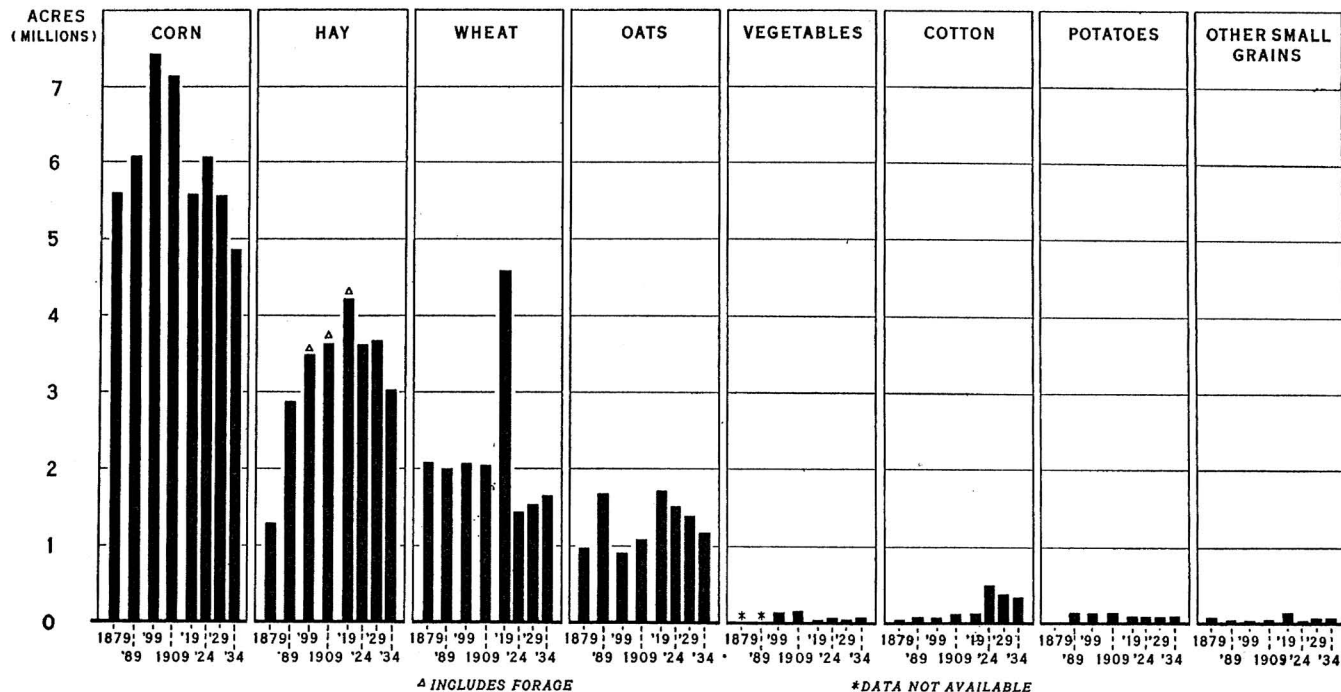
crease from 1919 to 1929. The back-to-the-farm movement during the depression years after 1929 brought about a sufficient increase in the acreage in farms to bring it to an all time high. Improved land (essentially crop land plus plowable pasture) increased and decreased likewise, the changes reflecting those in farm land. The upward trend of the acreage of harvested crops is more gradual than that of farm land or improved land. It reached a peak in 1919 and thereafter dropped off to 1929 with a still further and even more marked drop from 1929 to 1934. The low acreage in 1934, however, represents in part a curtailment because of abnormal drought.

Land in Crops.—The changes in area through which the acreages for a number of specified crops have gone during the period 1879 to 1929 are shown in Figure 9. Corn, always the major crop in terms of area, apparently reached its peak acreage in 1899, since which time its acreage has declined pronouncedly. Hay acreage on the other hand continued to expand until 1919, and fell off only moderately between that year and 1929. Wheat acreage, showing no definite trend from 1879 to 1909, had an unusual upswing in the war period, 1909 to 1919, but, following 1919, declined to a figure lower than that of 1909. The changes in oats, other small grains, cotton, potatoes and vegetables for sale, and their lower relative importance on an area basis in the successive census years, are also apparent in Figure 9.

The character of the changes in farm land use which have taken place in different parts of the state is evident from Figure 10. For the most part, the changes in these individual counties resemble the changes charted for the state as a whole. A few significant exceptions are worth noting.

The farm land in Atchison county, an area of favorable topography and fertile soil, quickly approached, following 1859, the total land area of the county. Improved land in this county has always made up a large part of the farm land and the area in harvested crops has always been a major part of the improved land. In contrast, the land area in Sullivan county, on admittedly poorer topography and less fertile soils, was taken up as farm land at a less rapid rate and neither improved land nor harvested crops have occupied as large a proportion of the farm area as was the case in Atchison county.

A similar situation prevailed in Greene county in southwestern Missouri, where the settlement and expansion apparently came more recently, and where local conditions apparently necessitate a larger proportion of unimproved land. Reynolds county in the Ozarks has but little of its land area in farms, and of the farm land but little is improved. The proportion of the improved land in harvested crops is high, although absolutely this figure also is very low. The trend of farm area in Reynolds county has been continuously upward from 1849 to 1929 with but few interruptions, a development quite different from that for most of the state. Harvested crops which expanded from 1879 to 1919 dropped back again from 1919 to 1929, the war expansion of 1919 evidently being excessive here as elsewhere in the state.



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Fig. 9.—The dominance over the period 1879-1929 of corn, oats, wheat, and hay relative to other crops is clearly revealed. Acreage of all the crops except cotton have declined recently.

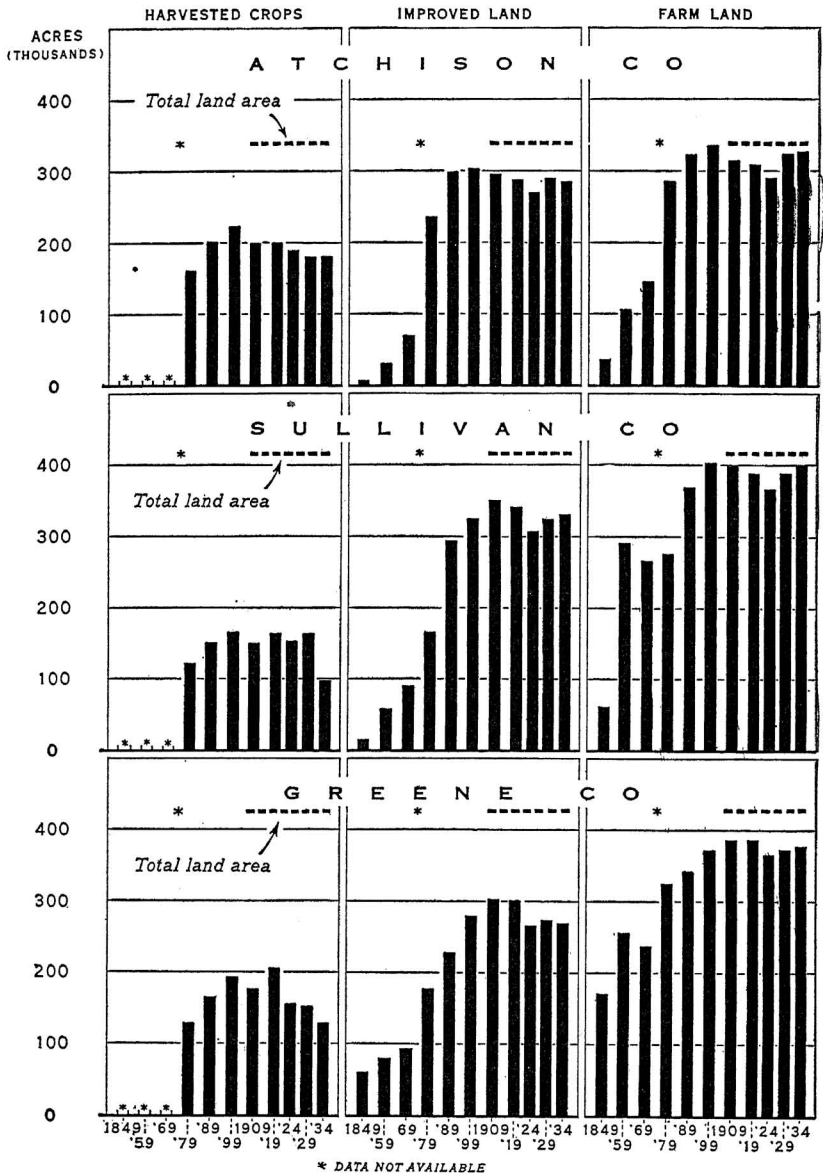


Fig. 10.—The variations in crop acreages in different parts of the state reveal a lack of uniformity in the use of the land for farming.

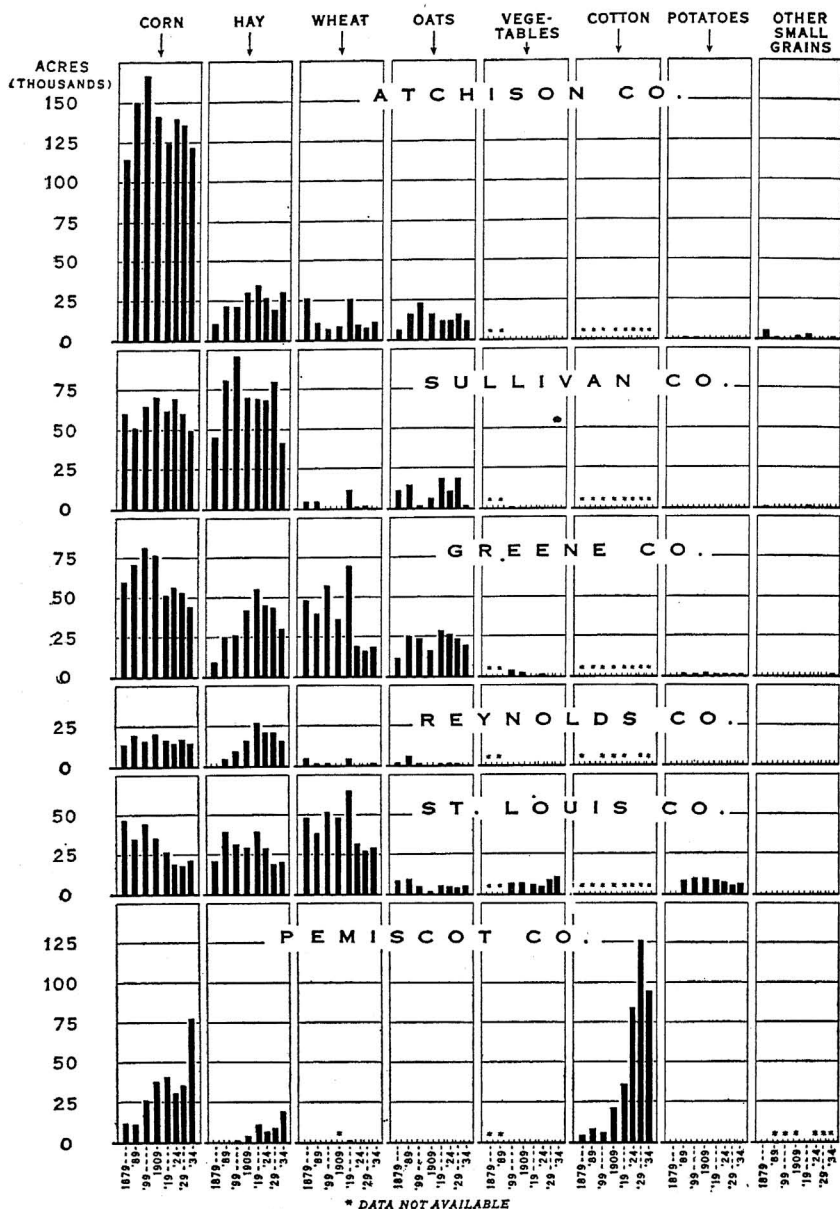


Fig. 11.—The differences in the variations from census period to census period in the crops grown in different parts of the state reveal a diversity in both past and present farm practices.

The upward trend of farm area in St. Louis county is not as marked as in some of the other counties, suggesting earlier settlement. The recent marked decline and the large area of non-farm land are suggestive of the urban influences at work taking the land away from farm uses. Similar developments have taken place in Jackson county, which includes Kansas City.

As most unusual among the differences in the state picture, Pemiscot county reveals the effect of recent settlement and the presence of much land needing reclamation through drainage. Since 1889 the farm land has increased appreciably and improved land and harvested crop areas have likewise increased. A considerable discrepancy still exists between the total land area and the land in farms. This probably represents land still needing reclamation.

The changes in the acreage of the seven specified crops and the proportions of each in the counties already studied are given in Figure 11. Generally, corn stands at the top among the crops in terms of farm area. Corn, however, is not always dominant. The acreages of hay in Sullivan and Reynolds counties, of wheat in St. Louis, and of cotton in Pemiscot have at one time or another exceeded the area in corn. Nor is the type of increase or decrease in corn acreage the same in all counties, Atchison, Greene, and St. Louis declining since 1899, Sullivan and Reynolds since 1909, but Pemiscot only since 1919. Differences may be noted for the other crops, also.

THE NUMBERS OF LIVESTOCK

The numbers of livestock in the state can also be studied from the standpoint of the present and of the past as in the study of the use of Missouri's land.

Present

According to the 15th Federal census of Agriculture, 1930, Missouri reports more than 2 $\frac{3}{4}$ million head of all cattle (Table 3).

TABLE 3.—NUMBERS OF LIVESTOCK IN MISSOURI¹

Kinds of livestock	Distribution	
	Totals	Number per 1000 acres
		of farm land
	Number	Number
All cattle	2,782,400	82.4
Cows & heifers kept for milk		
2 years old and over	969,569	28.7
Cows & heifers kept for beef		
2 years old and over	432,701	12.8
Other cattle	1,380,130	40.9
Sows & gilts farrowing	404,851	12.0
All swine	3,861,240	114.4
Sheep & lambs	1,750,089	51.9
Poultry	25,197,245	746.7
Work animals—(Horses and mules)	852,403	25.3

¹Fifteenth Federal Census, 1930.

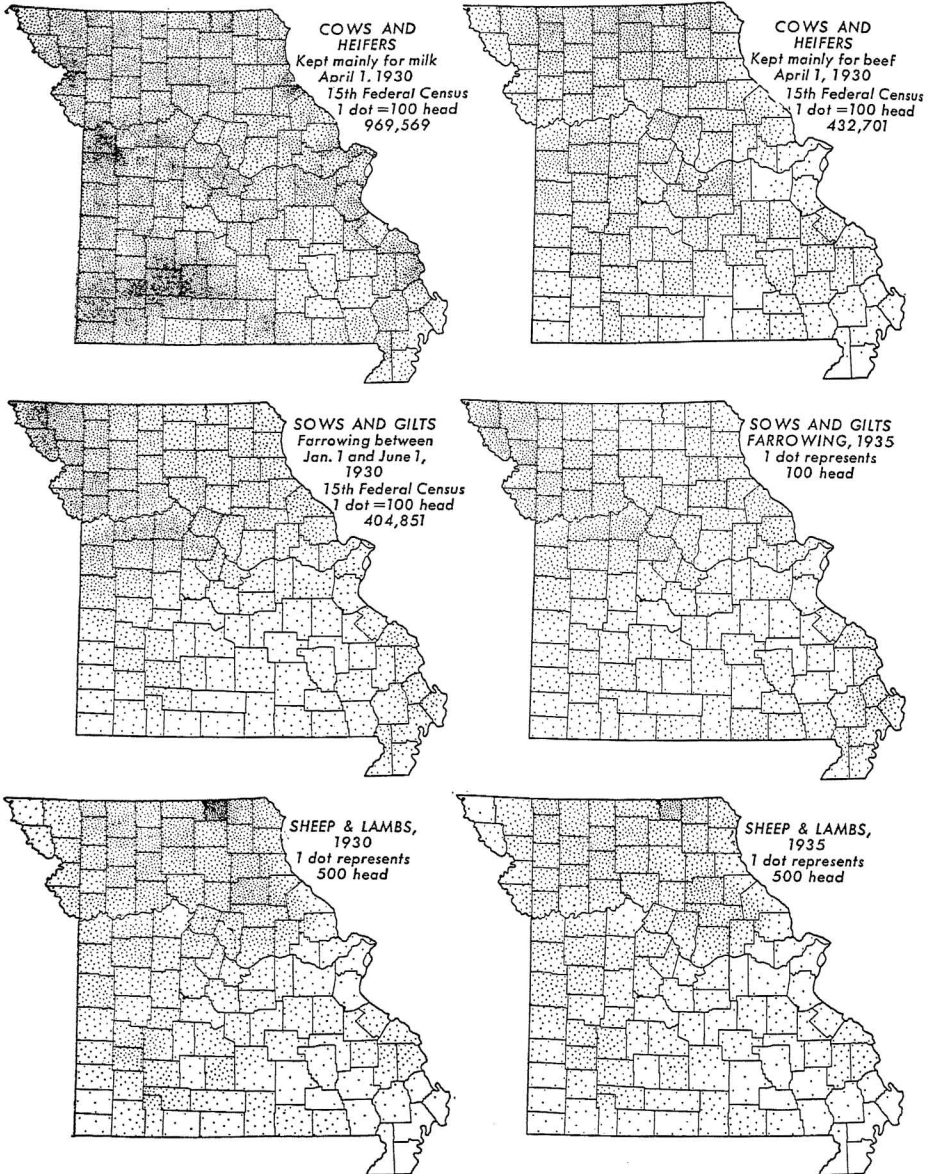


Fig. 12.—Cows and heifers kept mainly for milk are more numerous in southwestern Missouri and in the counties near the larger cities. Cows and heifers kept mainly for beef show a more even distribution, sows and gilts farrowing are concentrated in northern and northwestern Missouri, while sheep and lambs are more numerous north of the Missouri River.

Of these slightly more than a third are cows and heifers kept mainly for milk. As shown in Figure 12, these are not uniformly dis-

tributed, the areas of largest numbers centering about Greene county in southwestern Missouri and near Kansas City in the west central part of the state. The eastern and southeastern counties report few cows. The number of cows and heifers kept mainly for beef is less than half the number kept mainly for milk. These beef cows appear to be most numerous in the north central and northwestern counties.

Sows and gilts farrowing number about 400,000 (Table 3) and, like the beef cattle, are found in the northern and northwestern half of the state (Fig. 12). Sheep and lambs total about 1,750,000, the largest numbers being in the northern and northeastern parts of the State. Southeastern Missouri has only a few sheep, the southeastern lowland counties reporting practically none.

The numbers of chickens, like the other livestock, are highest in northern and western Missouri (Fig. 13) and lowest in the

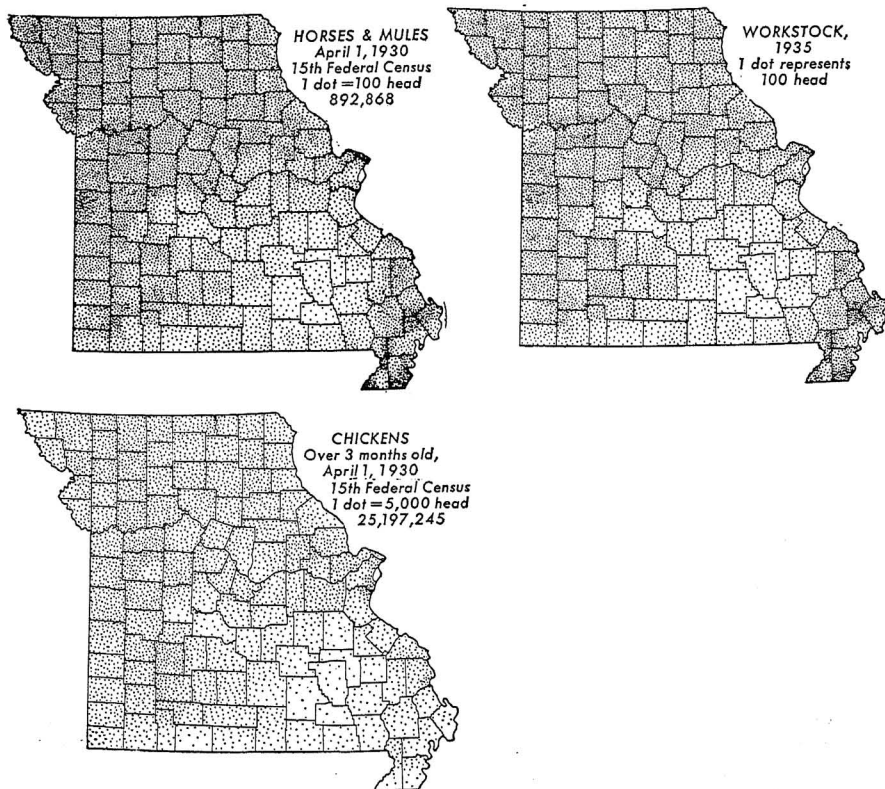


Fig. 13.—Chickens are evenly distributed, though smaller in number in Ozark counties. The distribution of horses and mules is much the same except in the Southeast Lowlands where, though there are few chickens, the work stock is numerous.

southern and southeastern parts. In like fashion the number of horses and mules is highest in the northern and western parts of the State and in the extreme southeastern counties.

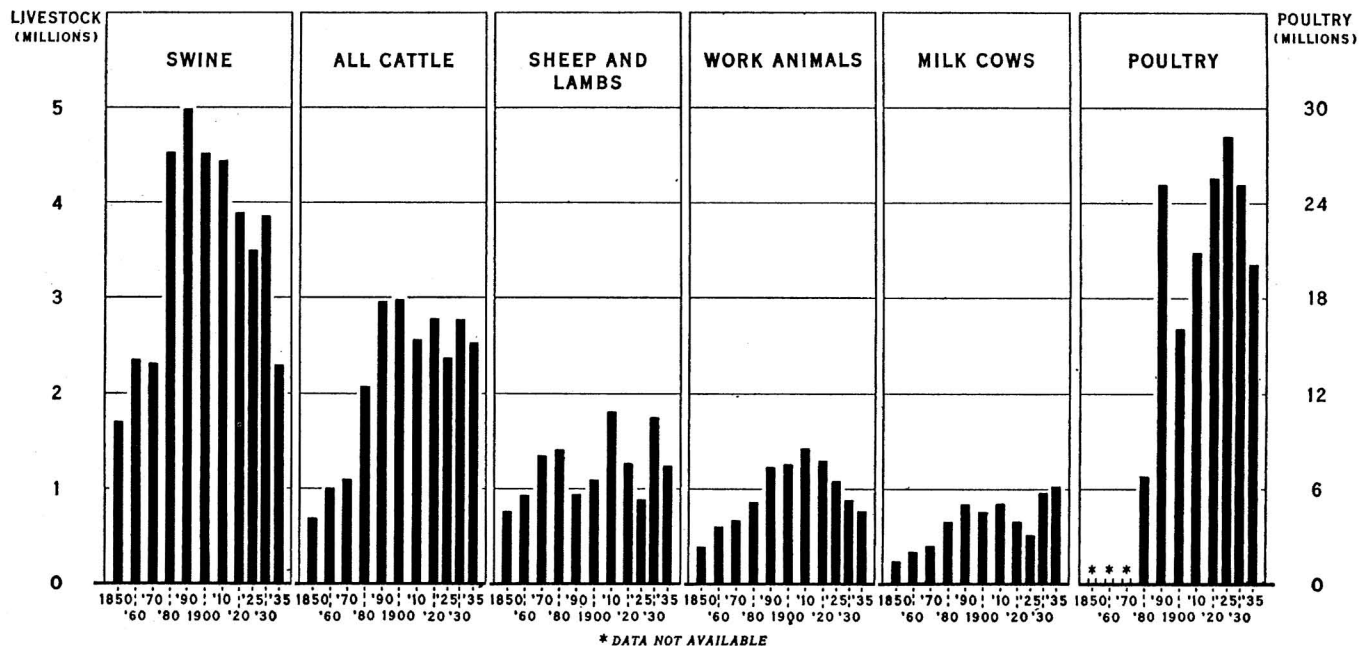
Past.

The numbers of livestock in Missouri, like the acreage of specified crops, have varied from census period to census period (Fig. 14). The various livestock types generally show an increase in absolute numbers up to 1890 or 1900, following which a less rapid increase, or even a decrease, has taken place.

Numbers of hogs reaching their peak in 1890, have fallen regularly from census period to census period since that time. All cattle likewise increased rapidly, particularly from 1870 to 1890. Since 1900 the numbers have varied but appear to be tending downward. The numbers of milk cows follow the trend of all cattle to a large extent. (Beef cow numbers have been reported only since 1900 and are not shown on the graph). Sheep and lambs, while varying somewhat, have apparently increased gradually over the period. The number of work animals reached its peak in 1910, since which time it has declined.

As in the case of land use, both in general and for the specified crops, these variations in numbers of livestock for the state as a whole, over a period of time, are accompanied by differences in the various parts of the state, as revealed in the county charts, Figure 15.

Emphasis on livestock in different parts of the state is significantly different, both as to numbers and trends in numbers, as shown in Figure 15. In general, numbers have increased and then declined. The peak in terms of numbers of hogs came as early as 1880 in Sullivan, Greene, and St. Louis counties, but not until 1900 in Atchison and Reynolds, and 1920 in Pemiscot. Hogs, though generally dominant in terms of numbers, were exceeded by all cattle in Sullivan county from 1890 to 1930, and recently in this same county sheep have also been more numerous than hogs. The numbers of all cattle have exceeded those of hogs in Greene county and numbers of milk cows in this same county have been increasing at a rapid rate. Livestock in terms of absolute numbers are not very prominent in Reynolds county or in the southeast lowland area, milk cow numbers, for example, being especially low.



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Fig. 14.—Swine outnumber all other kinds of live stock except chickens. Their numbers have been decreasing in recent years. Sheep and milk cows have been increasing in numbers.

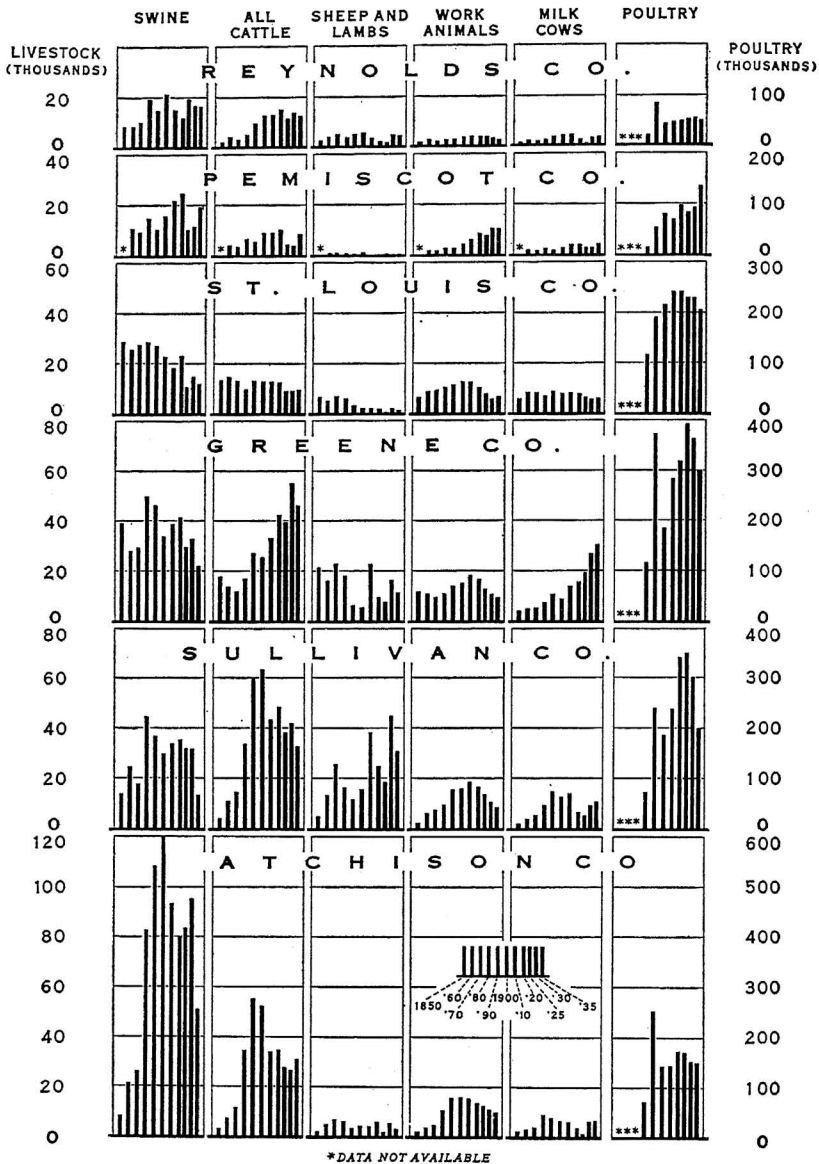


Fig. 15.—Changes in the numbers of different kinds of livestock for various counties of the state from census period to census period are by no means uniform.

GROSS VALUE OF PRODUCT AND REAL ESTATE VALUES

A measure of the achievement of Missouri's agriculture of unusual significance in a study of types of farming in the state is available in the gross value of farm products sold, traded or used in farm households. Regional differences are evident in this item also. Highest figures for gross value of product are reported

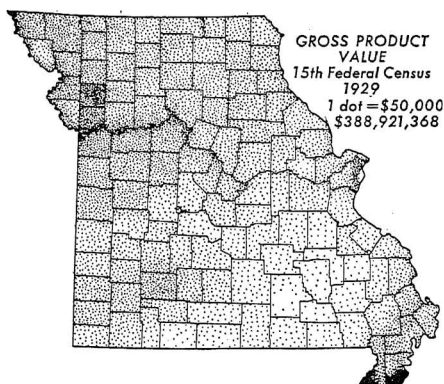


Fig. 16.—The value of the gross product, absolutely considered, is highest in the southeastern lowland, rather evenly distributed in northern and southwestern Missouri, but very low in the Ozarks. On the per acre basis the values are highest in southeastern Missouri and near the cities, with the lowest values in the Ozarks.

from the northern, northwestern and extreme southeastern parts of the state (Fig. 16).

The areas with the highest total value are not necessarily the areas with the highest figures for gross value of product per acre of farm land. The highest per acre figures for 1929 were those in the southwestern lowland counties of Pemiscot and Dunklin (Fig 16). Other high per acre figures are those in the counties near the larger cities as St. Louis and Kansas City. The high per acre values in the northwestern part of the State continue into several counties south of the west center of the state, but the values drop off quickly, as in Vernon and Barton counties, to rise above average again in Jasper and Newton and several adjacent counties, Greene being especially high in contrast with the adjacent counties. The contrast between the northeastern and northwestern parts of the state is worth noting. Of 21 counties north of the Missouri River and concentrated in the eastern half of the state all but one are below the state average in their gross value of product per acre, while of 23 counties north of the Missouri River and concentrated

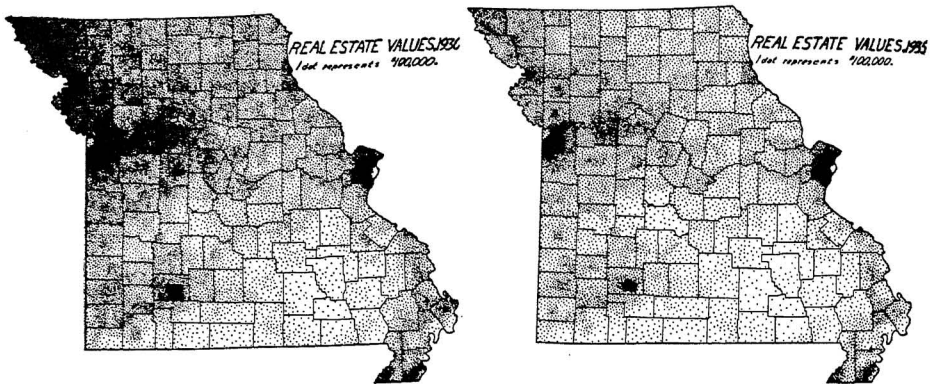


Fig. 17.—The investment in land and buildings is highest near the major cities and in northwestern Missouri, with the lowest values in the Ozarks. On a per acre basis values are highest near cities, and in northwestern Missouri, with the lowest values in the Ozarks.

in the western half of the state, all but one are above the state average in their gross value per acre.

This recognition of differences in the gross value of product of the state may be correlated with the real estate values, as shown by the value of land and buildings (Fig. 17) both total and on an acre basis. High total values occur near the two cities, St. Louis and Kansas City, in the northern, northwestern and western parts of the state, in the southwestern corner centering in Greene county, and in the southeastern lowland and a few of the Mississippi River counties. The entire Ozark area is low in terms of total real estate values. The per acre values parallel the above picture, with St. Louis county leading, Jackson county next, and the northwestern counties, though lower than these two, still significantly higher than the rest of the state. The southwestern counties adjacent to Greene and the southeastern lowland counties are still well above the average, while northeastern Missouri and the Ozark area are correspondingly low.

The preceding picture of the land use, the livestock numbers, the gross value of product and the real estate values is one of differences as one moves from place to place in the state. These differences in the agriculture, in both kind and degree, are important as indicative of the differences in the types of farming in the State and the forces which have brought them into being.

THE FORCES INFLUENCING DIFFERENCES IN MISSOURI'S FARMING

The foregoing differences in terms of crops, livestock, gross value of product and real estate values, it has been suggested, are associated with differences in the physical, economic, and other factors. The land resources include topography, soil, and climate. The economic influences are: (1) the external price relationships, including the effect of markets and transportation, and (2) the internal organizational relationships growing out of the particular character of the combination of enterprises adopted in the farm business. Biological and social factors also are involved, including the organic nature of plants and livestock and the nature of man himself.

Land as a Factor

Under the heading of land are to be included the topography or surface, the soils and the climate.

Topography.—The nature of the surface of the state may be judged from Figure 18, showing the land relief map and the general contour map. The Ozark area in southern and southeastern Missouri is distinctly rougher than other parts of the state. The much smoother area north of the Missouri River, as well as the two smoother areas in the western part of the state, west central Missouri and southwestern Missouri, may be read from the land relief map directly, or from the smaller number of lines on the contour map. The southeastern lowland adjacent to the Mississippi River appears as a plainlike area on both maps. Figure 19 summarizes the relief and contour maps into topographic regions known as the Plains, the Ozark Highland, and the Lowland. The subdivisions of the major topographic regions appear on the map, also.

Soils.—Perhaps the most important single factor influencing types of farming in Missouri are the soils. To facilitate description the soils of the state have been grouped into seven regions (Figure 19B). The soils within each region are roughly alike, though in three of these regions, subregions have been designated.

Soil Region 1.—This region is dominately Marshall silt loam. It contains also a large area of the Wabash soils in the river bottoms. Between the Wabash and the Marshall and occurring on the river hills are the Knox silt loams. The acreage of the Knox, which is a deep wind laid soil, is greatest in Platte and Buchanan counties and little or none of this soil is to be found at any considerable distance from the Missouri River.

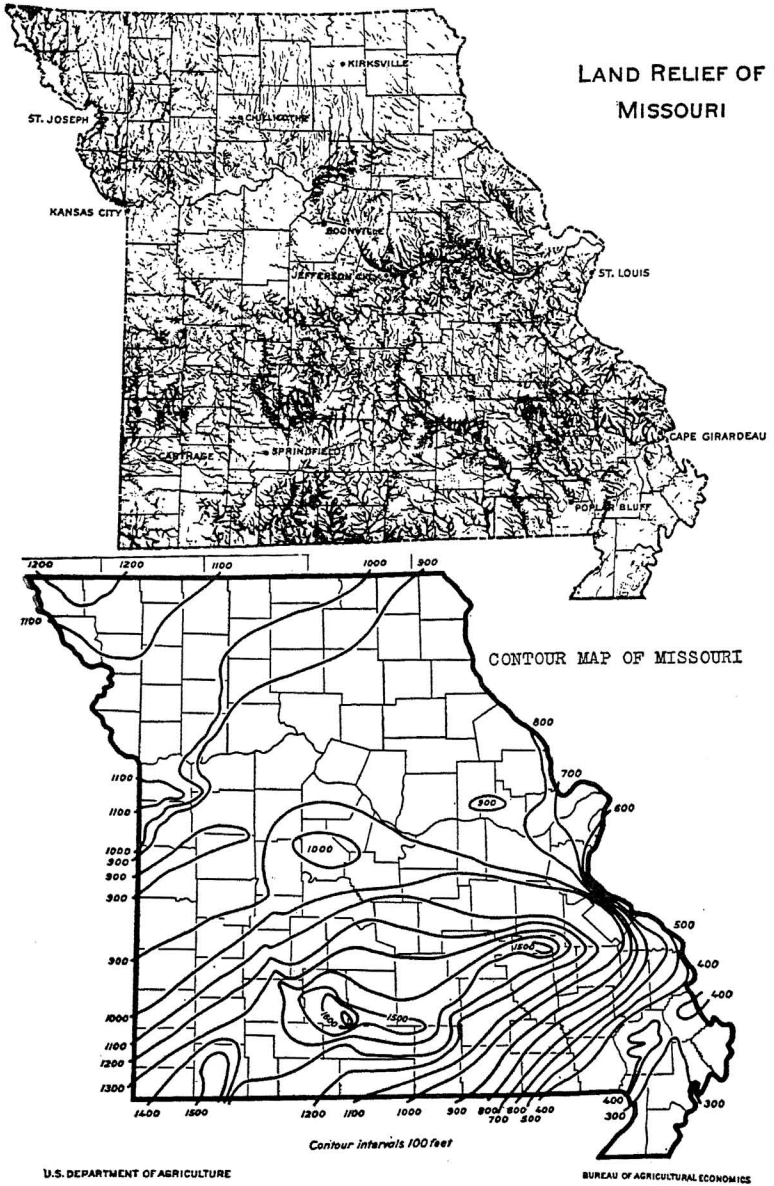


Fig. 18.—The rougher area in the Ozarks and the more level, plain-like areas in northern, northwestern, southwestern, and southeastern Missouri are readily seen on both the relief and the contour maps.

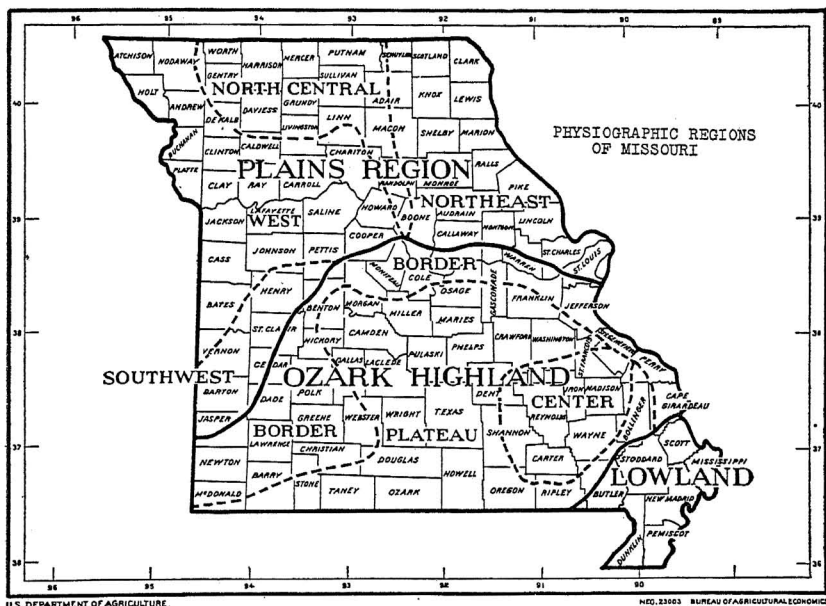


Fig. 19a.—The physiographic regions represent a summarization of the physical features shown on the relief and contour maps. The soil regions present some correlation with the physiographic regions.

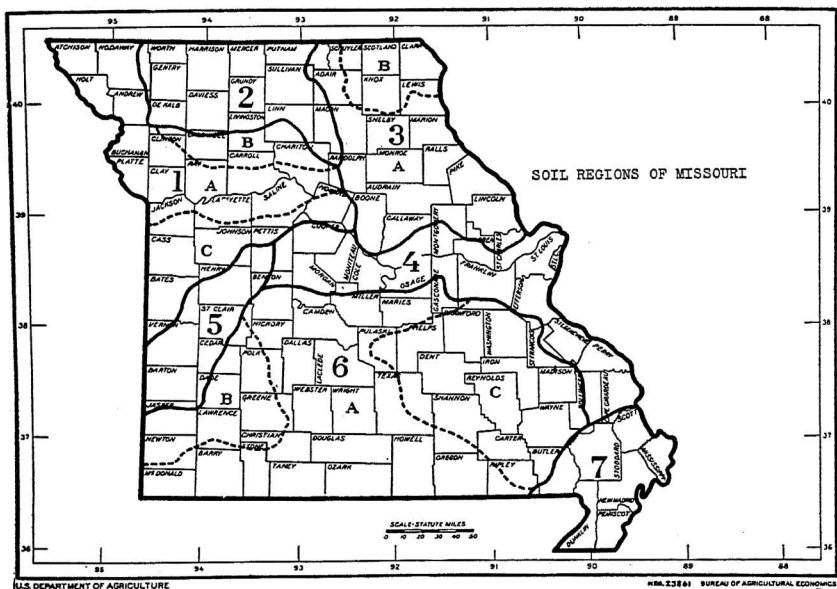


Fig. 19b.—The soils of each region, above, are reasonably uniform. For a description of the major soil type in each region consult the accompanying text.

All things considered, this region contains the most productive soil of the state. The nitrogen content of the soil of this area is high as Figure 19B makes clear. Nitrogen is a good, though not exact index, of fertility. It will be noted that the boundaries of soil Region I coincide closely with the boundaries of soils with a nitrogen content of 3000 pounds or more per acre in the surface 7 inches.

Subregion B of soil Region I is made up dominantly of Grundy silt loam though there are included areas of Shelby and Summit soil as well. The Grundy soils have a relatively level or smooth topography, and in this respect are quite the equal of the Marshall. However they are not as fertile nor as productive as the Marshall.

In subregion C of this region the soils are dominantly Summit with areas of included Oswego and Bates soils. Summit is definitely less productive than the Marshall and somewhat less productive than the Grundy as well. However Summit soils have a relatively smooth topography and are admirably adapted to mechanical cultivation.

Soil Region 2.—Much the greater portion of the area of soil Region 2 is a glacial soil, the Shelby loam. Associated with the Shelby are small areas of Grundy which occur in plateau like positions. Along the stream bottoms occur the Wabash soils, not as important in this as in the preceding soil region.

While the topography of the Grundy is smooth, that of the Shelby is rolling and, in the Eastern portions of the region, occasionally hilly. The Shelby is also a distinctly erosive soil and over large areas of it a considerable portion of the top soil is gone.¹

Both because of the topography and because of its lower nitrogen content (see Figure 19B) the Shelby is less productive than the Grundy and in general Region 2 soils are moderately fertile only though considerably above the average of the State in productivity.

Soil Region 3.—The Putnam silt loam is the characteristic soil of Region 3. Associated with the Putnam, however, and occurring along the so called "river breaks" are great acreages of the Lindley loam. Minor acreages of Knox and Hagerstown silt loams occur in the eastern parts of the region and in the river bottoms are to be found areas of Wabash.

The Putnam soils have a rather smooth topography, indeed in places the topography is quite flat. They are not remarkably fertile, however, and are much lower in nitrogen than the Grundy and Shelby soils though in turn much superior to the Lindley. The

¹See for instance pages 33 to 35 "Soil Erosion in Missouri" by L. D. Bayer, Missouri Agricultural Experiment Station Bulletin 349.

more notable character of the Putnam soil is its impervious subsoil. This subsoil forms a so called clay pan and because the water seeps through the subsoil only slowly, the surface soil becomes not only abnormally wet during periods of heavy rainfall, but is quickly subject to drought in periods of light precipitation.

The Lindley soils of this region are much less productive than the Putnam. Furthermore they occur upon hillsides and are therefore severely subject to erosion.

Baver comments "The Lindley loam is perhaps the most severely eroded soil type in the state. Originally it was timbered with white and other oaks. After the timber was cut and the land cultivated it did not require much time to lose most of the original 8 to 10 inches of surface soil. The strongly rolling to hilly topography as well as the subsoil cause rapid runoff of excessive rainfall and excessive losses of soil. At the present time practically all of the Lindley soils that have been cultivated have lost over three-fourths of their original surface and are now less than 4 inches in depth."¹

In the northeast portion of Region 3, there is an area of soil closely related to the Grundy and hence more productive than the Putnam. Interspersed with these Grundy-like soils are considerable areas of the Lindley so that the general level of productivity of subregion B is only moderately above that of subregion A. In general the productivity of Region 3 is less than that of Region 2 and much less than that of Region 1.

Soil Region 4.—While the soils of Region 4 are varied, the Union silt loam is the more common type. The chief associated types are the Hagerstown and Tilsit silt loams, both of which are found for the most part in the southern and eastern extremities of the region.

The Union silt loam is only a moderately good soil at best. Its topography is always rolling and commonly hilly. Where it occupies steep slopes it is more often than not stony. Nevertheless the Union as well as the Tilsit and Hagerstown is very generally farmed, though the proportion of it that is under actual mechanical cultivation is much smaller than is true for the dominant soil types of the preceding soil regions. Not only is a large percentage of the Union in pasture, therefore, but much of it is still in timber.

The Hagerstown soils are on the whole superior to the Union both because they are more fertile and because their topography is smoother. The Tilsit silt loam also has a less hilly topography than the Union but is less fertile than the Hagerstown and probably

¹See pages 35 and 36 of Missouri Agricultural Experiment Station Bulletin 349.

no more productive than the Union. On the whole, therefore, soils of Region 4 are moderately low in fertility.

Soil Region 5.—The soils of Region 5 are about equally divided between the Cherokee and Oswego and the Bates soils. None of these soils are of high fertility. The Cherokee and Oswego have a level topography and a stiff impervious subsoil and therefore poor internal drainage. The topography of the Bates is more rolling and the subsoil more friable. Its surface and internal draining are both good. All three soils are acid and it is necessary to lime to establish the clovers and alfalfa. None of them are high in nitrogen and both Cherokee and Oswego are seriously troubled by clay pans. In this respect these latter two soils are much like the Putnam silt loam of Region 3. They tend therefore, to be soggy after heavy spring rains while at the same time they are abnormally subject to drought during the hot mid-summer periods when and if the rains fail. In general the soils of Region 5, while they have a topography relatively favorable to farming, are low in fertility and therefore not highly productive.

Soil Region 6.—The largest soil region is number 6 which comprises the Ozark highlands, and its western border sometimes called the Springfield Upland. The predominant soil of the region is the Clarksville gravelly and stony loam and, in plateau like areas, the Lebanon silt loam. Both the Clarksville and Lebanon are among the most infertile soils of the entire state and the productivity of the entire region is so low that it has been characterized in a number of studies as marginal or submarginal for crops (see Figure 20A).

In subregion C of the area most of the soils are of the Clarksville stony type. These occupy a topography almost always hilly. Very little of the Clarksville stony soil is in cultivation and most of it still in timber though used at the same time for a desultory grazing (see Fig. 20B).

Even in subregion A of this region there are great areas of Clarksville gravelly and Lebanon silt loam. The topography of the Lebanon is relatively smooth but otherwise it is a poor soil. Miller and Krusekopf state, "The Lebanon silt loam probably has more unfavorable subsoil characteristics than any Ozark soil. . . . The level surface and the absence of stones favored the early occupation of the land. Many such fields have been abandoned, and these are now covered with a dense growth of scrub oak. The presence of the hard-pan does not permit a good under-drainage. As a result cultivation must frequently be delayed until late in spring. It

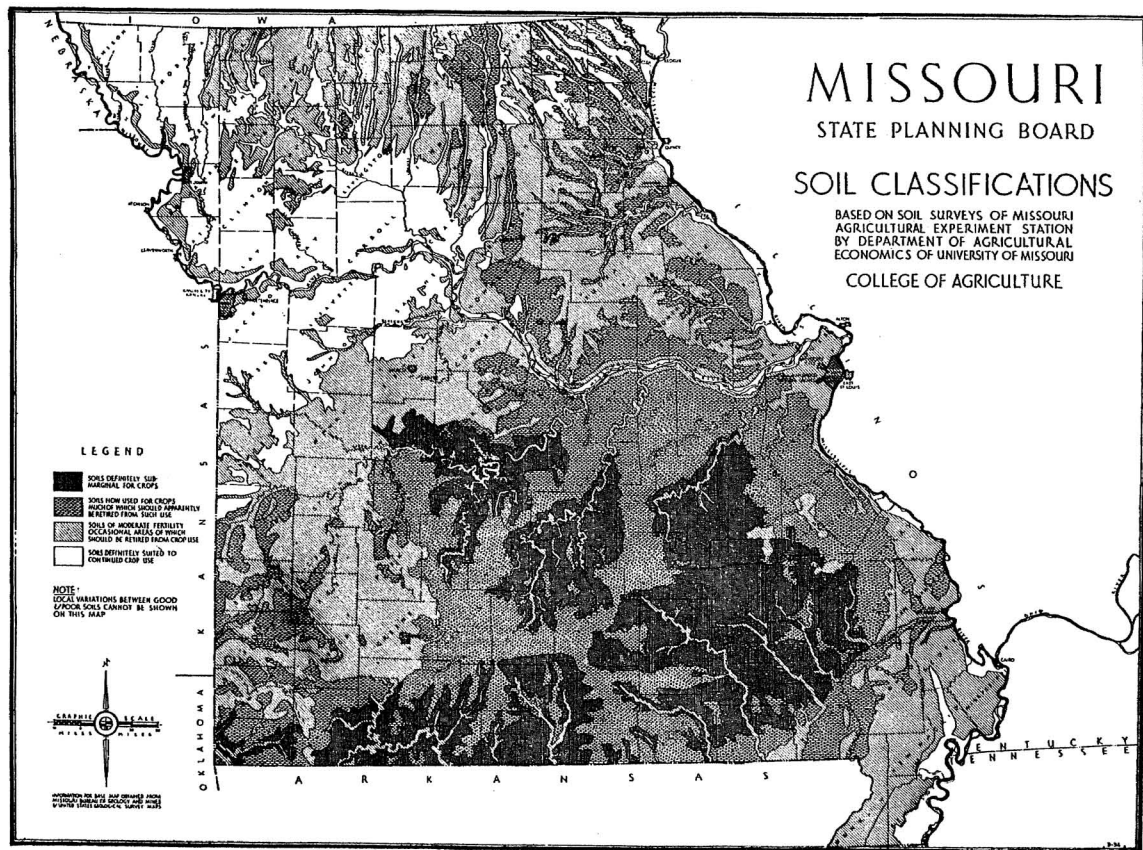


Fig. 20a.—A considerable portion of the land in the Ozark Highland region of Missouri is unsuited to agriculture because it is so hilly and stony. Fortunately much of such land is not in farms.

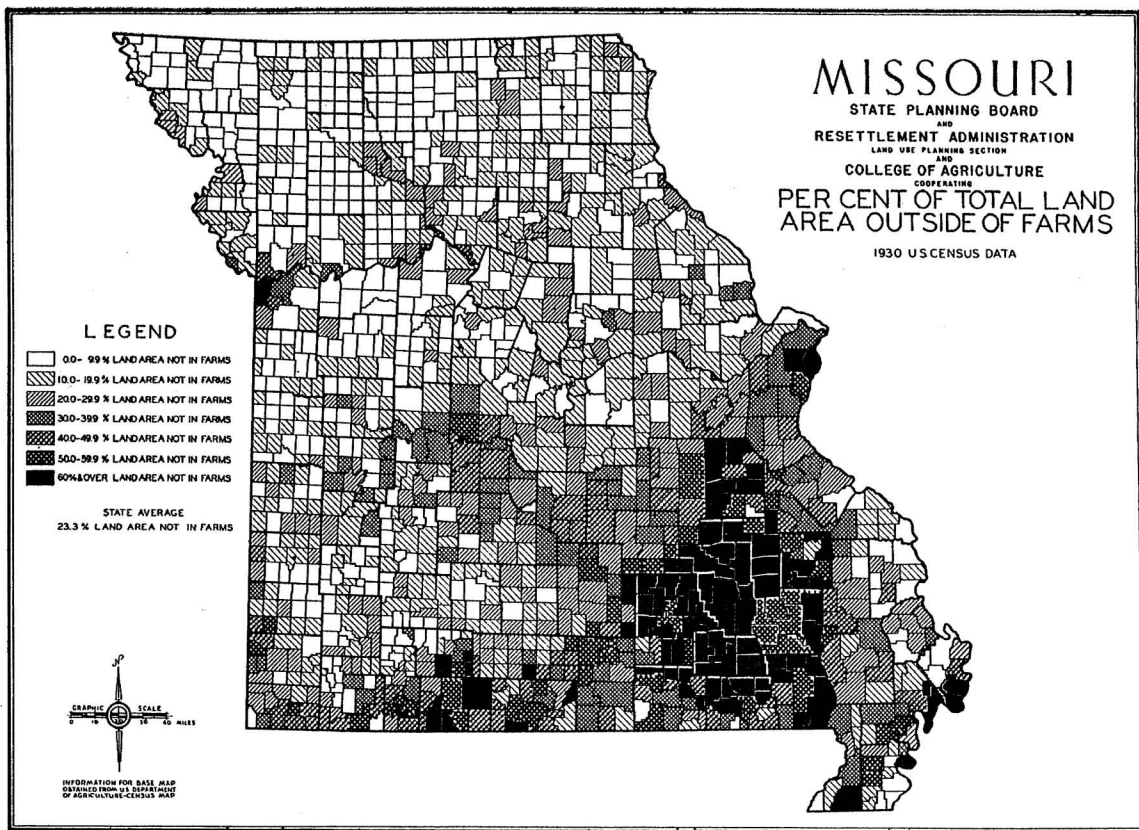


Fig. 20b.—A considerable portion of the land in the Ozark Highland region of Missouri is unsuited to agriculture because it is so hilly and stony. Fortunately much of such land is not in farms.

can be said that the Lebanon soils are among the least productive of the Ozark lands.¹¹

The Clarksville gravelly loam which occupies a much larger area, is a somewhat more fertile soil than the Lebanon. However its topography is rolling and even hilly and it is therefore less suited to cultivation than is the Lebanon. While considerable areas of the Clarksville gravelly are in farms much of it is still in timber and a large acreage of it is suited only to timber production. Most of the Ozark Upland was originally forest land and it is not too much to say that the future use of most of the area in subregions A and B appears to be for timber growing rather than for farming.

On the other hand the soils of subregion B are much superior to those of either subregions A or C. The dominant soil is the Crawford gravelly loam which is much more fertile than either the Clarksville or Lebanon. It has a relatively favorable topography and its structure is very good. That is, the Crawford soils are deep and friable and it is upon them that the apples and pears and other tree fruits of southwest Missouri are grown. They are also relatively durable soils and appear to stand up well under intensive culture.

Associated with the Crawford soil in this region are smaller areas of Lebanon, Bates, and Cherokee soils which are, without exception, inferior to the Crawford in productivity.

Soil Region 7.—The soils of Region 7 are alluvial soils deposited by the Mississippi, the Black and the St. Francis Rivers. The major soils are of the Sarpy, Sharkey, Lintonia and Waverly series. These grade all the way from the very fertile types such as the Sarpy and the Lintonia to the very infertile Waverly silt loam. All of these alluvial soils have an excellent topography but nearly always they are in need of drainage before they can be used for farming. The low lying Sharkey clay loam and Waverly silt loam are particularly likely to be swampy. The Sharkey is, furthermore, a heavy soil locally called "gumbo" and is somewhat intractable to handle because of its tendency to bake while drying. In general the more productive soils occur in the eastern and northern parts of the region and the less productive soils in the western and northwestern parts.

In addition to the alluvial soils, there are two ridge like areas of wind laid upland soil closely related to the Knox. The upland soils are on the whole less fertile than the alluvial soil, but for the

¹¹From "The Soils of Missouri", Missouri Agricultural Experiment Station Bulletin 264.

most part quite suitable to farming. The larger acreages of them are to be found in the northern part of the region.

Climate.—The climatological conditions prevailing in a region represent further dominating forces influencing the agriculture physically feasible. When taken for a relatively small geographic area, such as that included in a State, the climatological changes occurring are often inconsiderable and the tendency is to decide that these forces have no, or relatively slight, influence in determining the agriculture. For the country as a whole the influence of climate is emphatic and for the State of Missouri certain notable influences have clearly been at work.

Precipitation.—From Figure 21, portraying the normal annual precipitation for the State of Missouri, it would appear that no part is hampered by lack of rainfall for growing crops in an average year. The general seasonal distribution also appears to be excellent. Roughly, half the precipitation falls during the growing season from April to August, inclusive.

The factor of precipitation alone probably plays only a minor role in determining regional differences in the farming within the state. The specific criticism of the precipitation for the state as a whole is that excessive rains fall in the spring and until about July 1 to 15. From then on too little rain falls through the remainder of July and through August (Fig. 21). This is a factor affecting corn adversely, particularly on those soils such as the Putnam and Grundy with impervious subsoils. The heavy spring rains produce on such soils, a sogginess which is followed quickly by a baked condition when the drier period ensues. Other soils such as the stony or sandy loams, with subsoils of highly porous nature, also suffer from the inadequate summer precipitation. This periodic excess and deficiency of precipitation influences the choice of crops, resulting, for some areas, in the selection of small grains in preference to corn, because the small grains are matured before the coming of the drier summer season, and in the selection of sorghums in other areas, since sorghums are more drought resistant than corn.

Furthermore, the distribution of the rainfall within the growing season has a significant effect upon the cropping. A rather uniform distribution is to be preferred to one which concentrates a maximum of rainfall in a short period such as a day or two, and then suffers long intervals of rain free days. Even the most favorable soils will be adversely affected in both periods of alternating deluge and of drought.

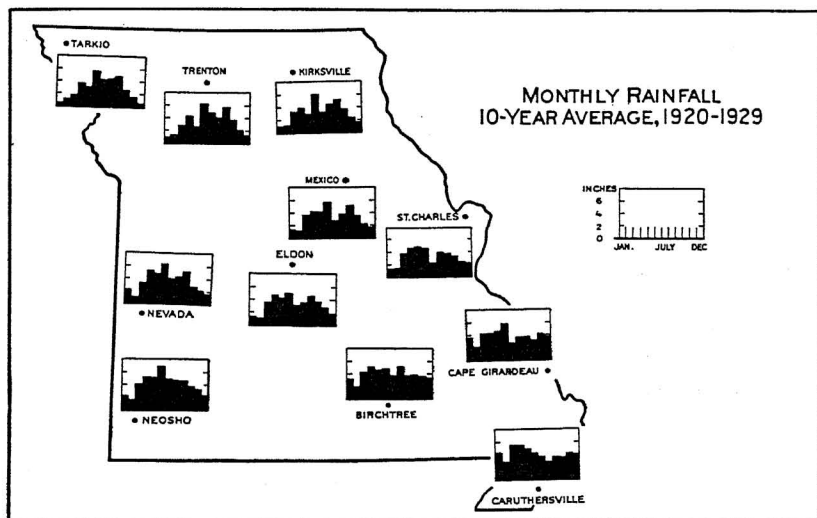
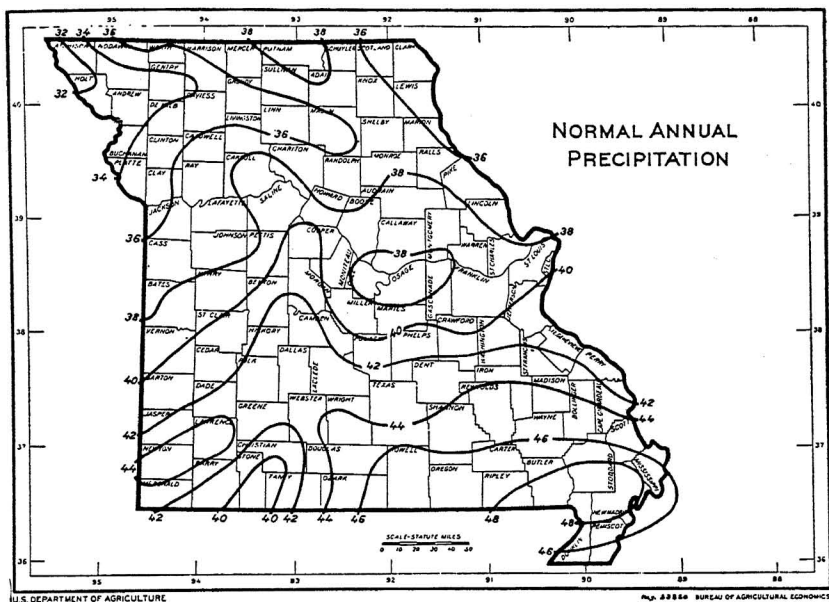


Fig. 21.—The normal precipitation of Missouri appears to be ample and the distribution generally satisfactory.

That there is no general lack of moisture, given favorable soil conditions, is apparent from the fact that some of the most productive lands of the state are in northwestern Missouri where the average rainfall is the lowest for the entire state. Here a quite satisfactory seasonal distribution of rainfall, favorable temperatures, a fertile soil, and a deep subsoil capable of adequate water storage and drainage, combine to affect the type of cropping and through this the type of farming.

In fact, the ample total rainfall of the state may even function in places to determine the type of cropping, not because of insufficient moisture but because of too much. On occasion when the spring or summer rainfall is excessive, areas of rolling land, and there are many of them in Missouri, suffer from erosion when too liberally utilized for intertilled crops, such as corn and soybeans. As a consequence a larger percentage of small grains and grass in relation to intertilled crops proves advisable in such areas. Winter wheat and winter barley, especially, because they occupy the land surface during the autumn and early spring, tend to check such erosion and for this reason displace other crops which might produce a greater immediate income.

Temperature.—The fact that Missouri's climate is continental undoubtedly has an important effect on her agriculture. Cool, humid marine climates are favorable to grass growing, while the sunny and occasionally dry weather of the Missouri summer, together with the often intense heat of the mid-summer period, are more favorable to a husbandry based upon cereal and other crops, the value of which is enhanced by a process of ripening. In general, therefore, temperature plays an important part in determining the type of farming in Missouri and undoubtedly explains in a measure the reluctance of farmers in certain parts of the state to increase their acreage of pasture and meadow even when the ravages of erosion brings rather forcibly home to them the necessity for soil conservation.

Both temperature and precipitation are also factors affecting the nitrogen content of the soil, as the researches of the Missouri Agricultural Experiment Station have disclosed. The yields of most crops and particularly of corn are in turn very sensitive to the variations in nitrogen content of the soil. This fact is of utmost importance to Missouri's agriculture, since corn is the most widely grown of all crops in the state.

The range in average temperature over the major part of the state, however, is not great and changes in cropping systems be-

cause of variations in temperature alone are probably matters of no great moment, (Fig. 22) though in certain years (notably 1936, 1934 and 1930) excessive July temperatures have been a major factor in limiting crop yields. Furthermore, when combined with a lack of precipitation, especially on those soils in which the sub-

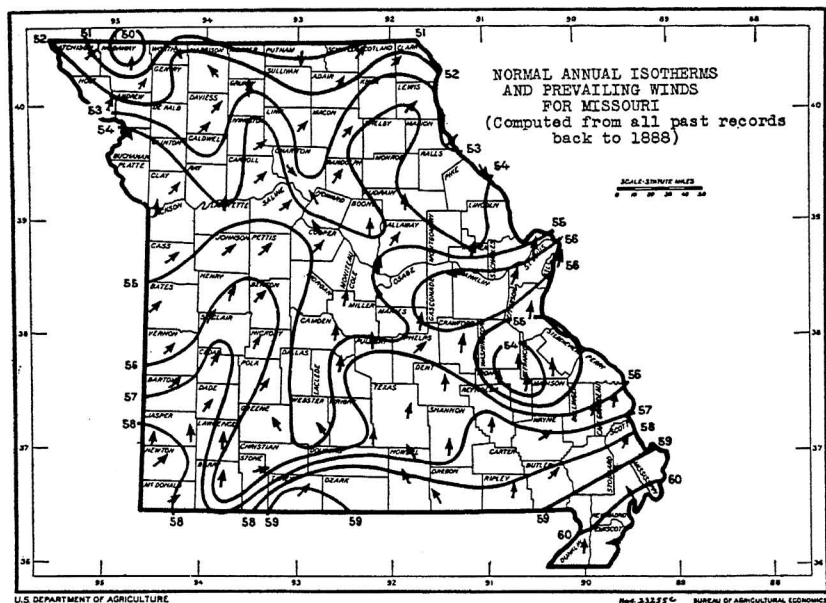


Fig. 22.—Average annual temperatures do not vary greatly from place to place in Missouri.

soil is either too pervious or impervious, the effects of high temperature are accentuated. Thus, corn, in some sections of Missouri is forced to give way in part to sorghums, to soybeans, or to cow-peas, because a slightly higher summer temperature is accompanied by deficient summer precipitation, or what amounts to a deficient summer precipitation because of the unfavorable character of the soils. The high temperatures accompanying drying winds in the western portions of the state may also have an effect upon the cropping. Hot drying winds apparently affect corn more severely than the sorghums. For this reason sorghums tend to replace corn to some extent in parts of the Plains region of Missouri.

Evaporation.—Evaporation is important in connection with precipitation for an otherwise ample rainfall may easily be offset by excessive loss of moisture to the air. Temperature is important in determining the rate of evaporation, but of moment also are soil

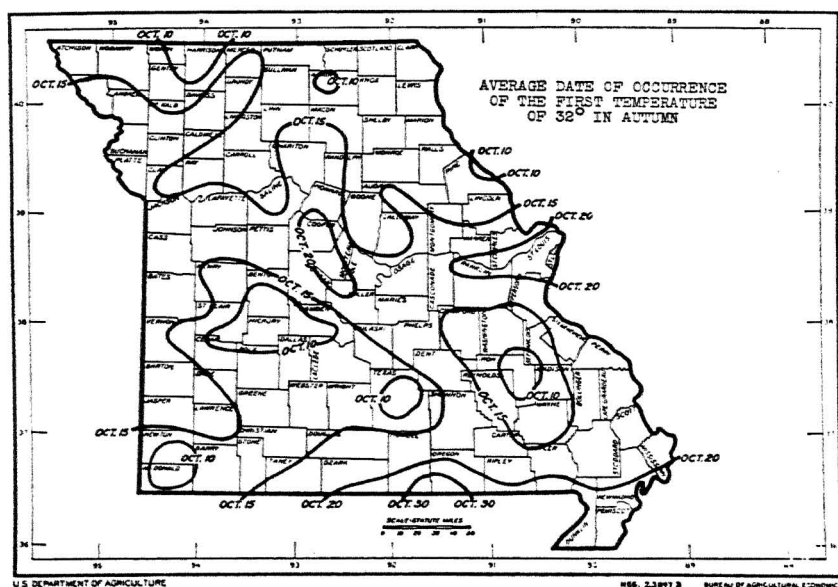
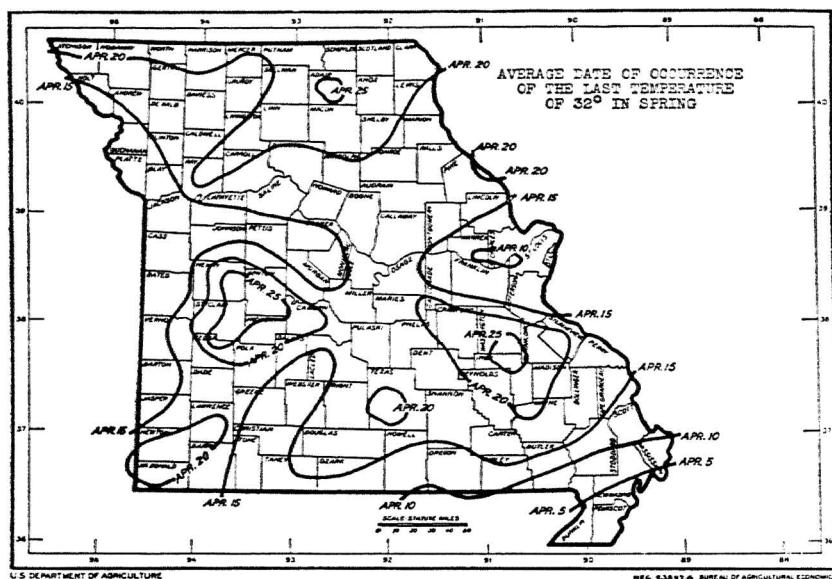


Fig. 23.—The frost dates do not show great differences from place to place in the state.

structure and texture, as well as the character of the air drainage. Hot drying winds, such as those encountered in the western part of the state, stimulate evaporation and offset the beneficial effects of an otherwise favorable precipitation, and through the adverse effects upon cropping, influence the farming.

Growing Season.—Frost dates are commonly recognized as setting the limits of the growing season, and in this manner affecting cropping practices. For the State of Missouri the last killing frosts in the spring and the first in the autumn fall on about the same dates in the Ozarks as in the northern parts of the state (Fig. 23). The length of the growing season over the larger part of the state, therefore, varies only between 165 days and 180 days (Fig. 24).

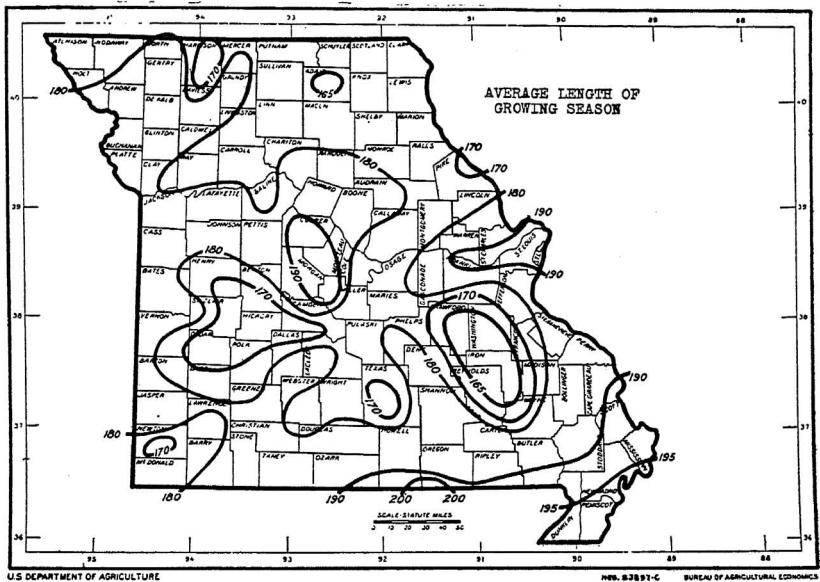


Fig. 24.—The length of the growing season is fairly uniform over the state, with the one exception of the southeastern lowland where it is considerably longer than in the northern part of the state.

The exception to this rule occurs in the extreme southeastern part of the state where the growing season attains a length of from 190 to 200 days.

Other Climatological Phenomena.—Other climatological phenomena, as storms, winds, hail, etc., are not recognized as having a significant influence in determining differences in farming in Missouri, although as part of the entire meteorological media in which the farming of Missouri functions, they do, of course, play some part.

Elevation and its Effect upon Climate.—The range in elevation for most of Missouri is not great; therefore its effect in determining differences in the agriculture of the State is not marked. Exceptions to this statement are to be found where the change in altitude brings with it an accompanying change in soil or topography. The small differences in altitude for the state as a whole tend to minimize somewhat the differences in temperature and length of growing season, as can be perceived from the climatological maps (Figures 22, 23, 24).

Local situations are often noted where favorable air drainage makes possible the growing of fruits and other crops susceptible to frost damages, while in other less favored regions the topographic situation is such that the currents of cold air settle over the surface, precluding the possibility of such cropping due to the excessive risk of frost.

The Economic Factors

The economic factors influencing farming may be separated into those external to the farm and those internal to the farm.

External Factors.—External economic factors include the interaction of supply and demand relations as these are affected by markets, distance thereto, transportation, and other influences, and usually are expressed in costs and selling prices. Costs would include the actual outlays for goods and services, or the imputed costs for these measured by the opportunities which exist, or are deemed to exist as alternatives. Selling prices are the objective prices received or expected for the goods and services produced upon the farm, and for which the above costs have been incurred.

Cost.—For Missouri, land values are generally higher in the northern part of the state than in the southern portion, and highest near metropolitan centers. Labor rates are also higher in the northern part of the state and near metropolitan centers. Power, equipment, and other costs are likely to vary in the same manner because of the fact that these are more abundantly used in North Missouri and near urban centers. Certain deficit feed areas exist south of the Missouri River. Feeds will tend to be higher here than in the feed surplus regions of the northern part of the state.

The higher land values of northern Missouri and the urban centers may correctly be said to exist as a result of the more productive type of farming made possible by the higher physical and higher economic production possible in these areas. The higher

labor rates, however, may be as largely determined by the alternatives which exist in occupations other than farming. The favorable economic opportunity to use this labor profitably in agriculture in the northern part of the state acts to maintain these higher rates. In contrast, the less favorable opportunities in agriculture existing south of the Missouri River function to depress the rates for the labor which is resident there and does not or cannot leave.

Selling Prices.—Selling prices in Missouri are generally higher in the urban centers and in the regions of deficit supply. The intensive types of farming surrounding the urban centers may be attributed to the favorable price situations existing. Similarly, the stocker and feeder hogs and cattle of the Ozark Highland are in some part a response to the favorable prices paid for these animals by feeders from the surplus feed sections, though certain local peculiarities in feeds and forage available (acorn mast in the case of hogs and free timber range in the case of cattle) are important additional factors.

Markets.—Markets as an influence in determining regional differences in farming have a marked effect upon the agriculture of the state as a whole and upon local sections of the state. The growth of a large consuming center gives opportunity to producers of a variety of products, particularly those which are perishable or semi-perishable. These urban centers are responsible for the truck crops and milk zones near the cities. Local orchards and small fruit acreages may develop for the same reason. Specialized potato, watermelon, or cantaloupe regions often owe their origin to a favorable market situation, but once developed, these specialized areas often reach out for market outlets beyond the local market opportunities.

Local markets have not been the final determinants in the location of most of Missouri's crop and livestock enterprises. Hogs, beef cattle, and grains are readily shipped over long distances. Butterfat, poultry and eggs, fruit, truck crops, and tobacco, although often brought together for a local market are, because of improved transportation facilities, now susceptible of long distance shipment to markets outside of the borders of the state.

Transportation.—It may be better to say for the state as a whole that geographical differences in Missouri's farming types are more definitely correlated with differences in transportation and access thereto than to differences in markets themselves. The markets as a whole stand potentially ready for all of Missouri's farmers. For restricted local regions, however, access to these markets

is occasionally limited because of ineffective transportation facilities on their entire absence.

Thus, Kansas City, St. Joseph, and St. Louis together with the markets of the eastern or southern states are potentially ready to accept Missouri's farm products. Apart from the local influences of the two metropolitan centers and the lesser influence of the smaller cities, types-of-farming in Missouri may be said to be a response to general rather than to specific market influences.

Railroads.—With the exception of the central portions of the Ozark region, all parts of Missouri have ample access to railroads, and in most cases, such access enables a choice of alternative markets. (Fig. 25).

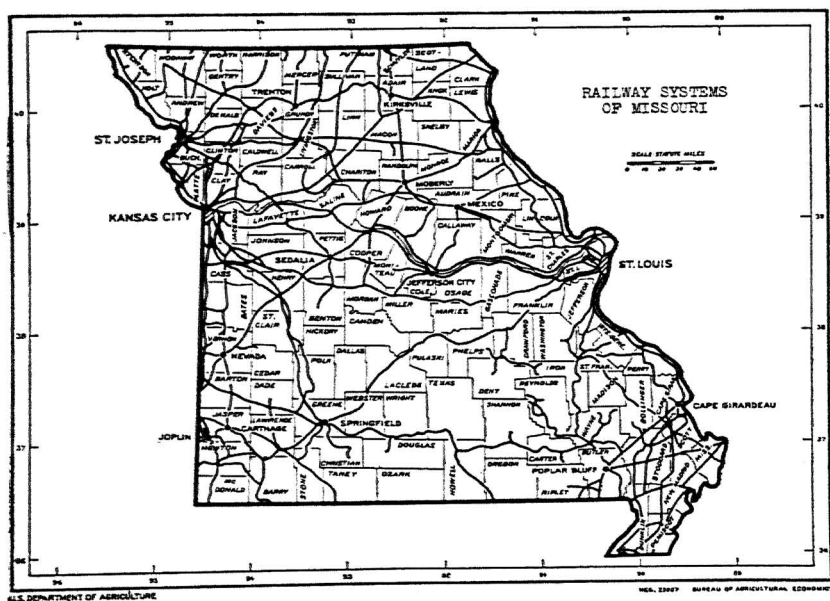


Fig. 25.—The state, with the exception of the rougher Ozark area, which lacks rail facilities, has a well distributed railway network.

In the northwest, railroads lead to Kansas City, St. Joseph, Des Moines or Omaha, and as well to Chicago and St. Louis. In the northeast, they lead to Chicago or St. Louis. In the southwest, one group of roads leads north to Kansas City, but there are two alternative routes to St. Louis. The Southeast lowlands are particularly well supplied with rail facilities and have a wide choice of markets to north, south, and east.

Only the central Ozark Region is poorly supplied with rail facilities, and even here the fringe is well traversed, while two routes of the St. Louis and San Francisco railroad cut directly across the Highland. The St. Francois mountain district, because of the traffic provided by the mines is, despite its ruggedness, better supplied with rail facilities than the other portions of the central Ozark region. Only three counties of the State have no railroad mileage. These are Dallas, Camden, and Ozark. The two former counties are narrowly missed, however, and can hardly be called less well supplied with railroad facilities than the majority of the Ozark Highland counties.

Truck lines have grown up to supplement railroad facilities where the amount and direction of freight traffic are such as to permit. Doubtless these truck lines have to a considerable extent corrected the lack of transportation facilities for the Ozark region, and increased the already good facilities for the remainder of the state. No satisfactory data on the exact extent of such traffic are available to give statistical proof of the above statement.

There is no reason to suppose that the types of farming in Missouri will be much conditioned from section to section because of rail facilities alone. The only possible exception is the Ozark Highland. In this region there are evidences that the dairy enterprise has secured a good foothold along the railroads but gives way to the raising of beef cattle where distances from rail are great. In other words, it seems quite possible that the lack of rail facilities has held back the development of dairying and forced a greater reliance on beef cattle than might otherwise have been the case.

Highways.—It is probable that few farm enterprises in Missouri are seriously affected by a lack of roads. The normal situation is ready access to a road that has at least been graded. Dairying in some parts of the state may be awaiting the development of a road system that is dependable for service at all times of the year, however. Farmers avoid a daily or semi-weekly delivery of milk or cream when automobiles or wagons must traverse the distance to town hub deep in mud, as is too often the case in certain seasons on unsurfaced roads. The low mileage of "all weather roads" in certain Ozark counties and in north central Missouri may therefore have been a factor retarding the development of dairying in those areas.

Internal Factors.—Internal economic forces included the competition between the systems of farming physically feasible. This

competition may be resolved upon the basis of the comparative advantage of some single crop over against all the others. Corn for example, in most of Missouri's counties assumes so dominant a place in the cropping that it affects the entire farm organization. In parts of Missouri wheat assumes this dominance and in southeastern Missouri cotton takes first place. In some regions no one crop is sufficiently superior to all others to assume a dominant position, but instead, the system which is economically feasible is one including more or less nearly equal parts of several crops.

The comparative advantage of a given crop, or a given system, may arise because of advantageous yields based upon soil or topographic or climatic features, or upon favorable production conditions irrespective of yields because of advantageous labor conditions or available capital. The effect of soil, climate, and crop combination upon yields is a major factor in limiting the spread of corn and favoring the presence of wheat, the sorghums, and in some cases, oats, soybeans, or even the forages. The availability of labor at low rates is unquestionably a factor favorable to the fruit and dairying of the southwestern part of the state, and also the cotton of the southeast lowlands.

Biological and Personal Factors

The specific biological influences limiting the farming in Missouri are not always readily apparent. Ordinarily these forces work quietly and are often unrecognized after the type of farming is established. This situation arises because the farming is at present so constituted as to hold the influences in check at or near the economic minimum. Thus, latent insect pests, diseases, and weeds are ordinarily ready to become potent forces should the cropping or livestock organization deviate from this optimum.

Continuous cropping or excessive cropping to small grains in Missouri would favor the spreading of certain types of weeds. The addition to the crop rotation of a cultivated crop such as corn, sorghum, or soybeans functions to clean the land of weeds and in this way, weeds influence the cropping combinations. On the other hand, corn suffers severely at times from chinch bug and grasshopper damage. Both of these pests winter best under the cover provided by stubble or by forage plants. The net effect on farming systems in the state of either weed or insect pests is, however, scarcely ever clearly discernible.

Not to be overlooked in the consideration of these other forces influencing the farming in Missouri are the personal characteristics of the individual farmer himself, his likes and dislikes, his national-

ity, and the previous experience which has grown out of these, the age of the farmer, and the economic demands made upon him by family and community ties, by church, state, etc. Although it may not be possible always in the case of biological and personal factors to point to a definite and positive relation between these and a resulting type of farming, yet these factors have acted (and are acting) to propel farming in the direction which it has taken.

THE TYPES OF FARMING IN MISSOURI

The preceding picture of the land use, the crops grown, the livestock on hand, the gross value of products, and the real estate values reported has given an idea of the agriculture of the state, and particularly the differences in the agriculture from place to place. This picture of the agriculture and its differences, while instructive and helpful, may not have given an understanding of the types of farming to be found in Missouri, nor a proper idea of their importance. For example, areas with much corn may have either cash grain or livestock farming. Corn fed to livestock may be used for cattle or hogs, or both. Areas with much wheat may have this crop in rotation with other crops as corn, oats and hay, or the wheat may be grown largely to the exclusion of other crops. In an attempt to picture more clearly the type of agriculture in Missouri, the sources of the gross value of products need to be analyzed.

The Type of Farming in General

Missouri is primarily a livestock state, judged by the fact that for 1929 43% of the gross value of products was derived from livestock and 23% from livestock products: a total of 66% from livestock enterprises (Table 4).

To this must be added approximately one-half of the value of products used by the household (16 per cent), making a total of at least 74 per cent. Almost three-fourths of the entire product sold, traded or used in the household are to be credited to the

TABLE 4.—THE SOURCES OF THE GROSS VALUE OF FARM PRODUCTION IN MISSOURI¹

Source	Value distribution	
	Total	Percentage
	Dollars	Percent
Crops	67,723,303	17
Livestock	168,429,791	43
Livestock products	88,735,176	23
Forest products	3,934,752	1
Household use	60,098,346	16
Total	388,921,368	100

¹Fifteenth Federal Census, 1930.

livestock enterprises. Crops directly accounted for 17 per cent of the gross product and forest products 1 per cent.

The Specific Farming Types

A further aid in picturing the types of farming followed in Missouri is the mass of data provided by the 15th Federal Census of Agriculture dealing with types of farming. The classification of all farms into twelve major and five minor types offers an opportunity to portray the agriculture of the state in much greater clarity, particularly with reference to the types of farming which prevail. The basis of the above classification is the gross value of the production reported for each farm. In general, 40 per cent or more of the gross product from one source designates the type. The proportion which each type represents of the total is given in Table 6.

The cotton type of farm in Missouri is known to employ many share cropper tenants listed in the Census as other tenants and reported as separate farms. These croppers are in reality part and parcel of the larger farm to which they are attached. By reducing the number of cotton type farms to include only owners, part owners, managers and cash tenants, the more readily comparable characteristics of the cotton farm unit appear. For instance, the average size of the original classification was 54 acres. This becomes 275 acres when the number of cotton farms is revised downward, as above stated.

The characteristics of the various types of farms using this reduced number for cotton farms based on state averages are shown in Tables 5-11 inclusive. Some of the items, such as those on percentage basis, are more effectively contrasted horizontally, that is, when the percentage for the item considered is contrasted with the percentage for the number of farms of the given type. Other items, such as the per farm or per acre figures, are more effectively contrasted vertically, i. e., when the figure for one type is contrasted with the figure for the similar item for another type.

The general farms represent the largest single group (34.9 per cent) but, since they are smaller than average in size, they occupy a slightly smaller (than 34.9 per cent) proportion of the farm area. The small size and limited productivity are expressed in the gross value of product per farm, which is low, being about two-thirds of the state average. This lower gross value goes hand in hand with the lower real estate values on these farms (Table 5). The quality of the land of these general farms is further revealed

by the gross product per acre, which also is low, being next to the smallest of all types (Table 7).

The general farms are to a large extent livestock in character: milk cows, beef cows, and swine being important. Because of the large number of farms involved, this group includes more milk cows than any other group (Table 5) although the density of stocking based on the numbers of cows per 1000 acres of farm land is only about two-fifths that found on strictly dairy farms (Table 8). The livestock character is further shown by the fact that the livestock and livestock products sold or traded represent 58 per cent of the total gross product, crops alone contributing only 16 per cent. The modest productive capacity of these farms is borne out by the figure showing that almost one-fourth of the total gross product was used in the household (Table 9). Of this amount the larger proportion undoubtedly came from the livestock enterprises.

Animal-specialty farms are important in Missouri, not only because of their large numbers (24.5 per cent of the total and the second largest group) but because their larger than average size and higher productivity gives them the largest farm area, the largest gross value of product and the largest investment of any single

TABLE 5.—TYPES OF FARMING IN MISSOURI¹

Types of farms	Percentage distribution of—					
	Livestock					
	Cows & heifers		Other cattle including calves	Sows and gilts	Other pigs 3 months and over	Workstock horses and mules
	Dairy	Beef				
	Percent	Percent	Percent	Percent	Percent	Percent
General	38.3	20.2	27.3	25.1	21.5	33.6
Animal specialty	24.9	69.4	50.9	57.0	62.5	34.0
Self sufficing	5.6	2.7	3.4	3.0	2.7	6.7
Poultry	5.5	3.1	4.0	2.8	2.3	5.0
Abnormal	2.9	1.6	2.1	1.8	2.0	3.1
Dairy	17.0	.6	8.4	3.3	3.1	5.3
Cash grain	3.4	2.0	2.7	4.8	3.8	6.8
Cotton	1.2	.1	.5	1.4	1.4	3.9
Fruit .....	.6	.1	.3	.2	.2	.6
Crop specialty .....	.4	.2	.3	.5	.4	.7
Truck .....	.2	.2	.1	.1	.1	.3
Unclassified	—	—	—	—	—	—
Total	100.0	100.0	100.0	100.0	100.0	100.0

¹Fifteenth Federal Census, 1930.²Less than .1 percent.

TABLE 6.—TYPES OF FARMING IN MISSOURI¹

Types of farms	Percentage distribution of—									
	Number of farms		Area	Gross value of product	Investment				Land Use	
	Original	Revised			Land and bldgs.	All bldgs.	Dwellings	Implements	Harvested crops	Plowable pasture
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	
General	33.3	34.9	33.4	24.4	28.3	30.7	31.1	29.7	32.7	29.0
Animal speciality	23.4	24.5	36.3	43.3	38.7	35.4	32.8	38.9	36.4	46.1
Self-sufficing	10.7	11.2	6.8	2.8	4.1	5.2	5.9	3.3	4.4	4.9
Poultry	6.9	7.2	4.8	4.7	4.5	6.2	6.5	4.7	4.1	5.1
Abnormal	6.2	6.6	2.6	4.4	3.7	5.4	6.4	3.5	1.5	2.7
Dairy	5.9	6.2	5.6	7.2	6.5	7.0	6.9	6.9	4.9	6.9
Cash grain	5.7	5.9	6.7	5.3	8.7	5.8	5.7	8.1	9.9	3.9
Cotton	5.6	1.1	2.2	5.6	2.8	1.8	2.0	2.6	4.3	.4
Fruit .....	.9	.9	.6	1.0	1.0	1.0	1.1	.9	.6	.4
Crop speciality .....	.8	.9	.8	.8	1.0	.8	.8	.8	1.0	.5
Truck .....	.6	.6	.2	.5	.7	.7	.8	.6	.2	.1
Unclassified	—	—	—	—	—	—	—	—	—	—
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

¹Fifteenth Federal Census, 1930.TABLE 7.—TYPES OF FARMING IN MISSOURI¹

Types of farms	Values of Gross Product & of Real Estate—per Farm and per Acre									
	Gross Product		Land and Buildings		All Buildings		Dwellings Alone		Implements	
	Per Farm	Per Acre	Per Farm	Per Acre	Per Farm	Per Acre	Per Farm	Per Acre	Per Farm	Per Acre
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
General	1,173	8.73	6,047	45	1,787	13	1,044	8	334	2.52
Animal speciality	2,968	14.28	11,831	57	2,948	14	1,569	8	633	3.04
Self-sufficing	422	4.98	2,736	32	940	11	612	7	118	1.45
Poultry	1,091	11.73	4,653	50	1,754	19	1,057	11	258	2.78
Abnormal	1,131	20.37	4,251	77	1,701	31	1,152	21	211	3.81
Dairy	1,964	15.23	7,937	62	2,313	18	1,315	10	441	3.42
Cash grain	1,492	9.38	11,001	69	1,996	13	1,127	7	542	3.41
Cotton	8,296	30.21	18,522	67	3,183	12	2,008	7	923	3.36
Fruit	1,699	20.87	7,670	94	2,183	27	1,380	17	390	4.79
Crop speciality	1,659	12.80	8,267	64	1,842	14	1,013	8	379	2.92
Truck	1,520	34.81	8,645	198	2,275	52	1,623	37	430	9.85
Unclassified	—	—	—	—	—	—	—	—	—	—
Total	1,679	11.97	7,477	53	2,036	15	1,171	8	398	2.84

¹Fifteenth Federal Census, 1930.

TABLE 8.—TYPES OF FARMING IN MISSOURI¹

Types of farms	Numbers of livestock per 1000 acres of farm land					
	Cows & heifers		Other cattle	Sows and gilts	Other pigs	Horses and mules
	Dairy	Beef				
	Number	Number	Number	Number	Number	Number
General	28.2	6.5	39.8	9.2	35.9	24.8
Animal specialty ...	16.8	20.5	68.8	19.3	96.2	23.2
Self-sufficing	20.4	4.2	24.7	5.5	22.8	24.5
Poultry	28.5	6.9	40.7	7.2	26.7	26.0
Abnormal	27.5	6.6	39.1	8.5	42.7	29.2
Dairy	73.5	1.2	72.0	7.1	30.5	23.1
Cash grain	12.6	3.1	19.4	8.8	31.6	24.9
Cotton	13.7	.6	11.6	7.9	34.5	43.6
Fruit	24.8	2.4	28.0	3.4	18.0	24.6
Crop specialty	11.7	3.1	17.5	7.9	29.1	21.1
Truck	21.0	1.6	19.8	5.0	20.1	41.3
Unclassified	—	—	—	—	—	—
Total	24.6	10.7	48.7	12.3	55.9	17.4

¹Fifteenth Federal Census 1930.

group (Table 6). They include more than two-thirds of the beef cows, more than half of the other cattle, over half of the sows and gilts farrowing, and over three-fifths of the other pigs (Table 5). Numbers of sheep are not available by types of farms, but the animal-specialty farms would include most of the sheep in Missouri also. Although these farms have the largest percentage of harvested crops of all farms, they also have the largest percentage of plowable pasture, including, as they do, almost half of the plowable pasture reported for all farms (Table 6). These characteristics all suit their larger size and livestock character.

The animal-specialty farms have the highest density of stocking in terms of beef cows, other cattle, sows and gilts farrowing and other swine. They would rank high in sheep also were these figures available. They are low in terms of milk cows (Table 8).

The per acre gross value of products for these farms is not the highest by any means. Because of their larger size, however, they have the second largest gross value per farm. This fact helps explain their high real estate value per farm, while the high value of buildings per farm is associated with their livestock character and larger size (Table 7). In keeping with their heavy stocking with livestock, almost 85 per cent of the gross product comes from livestock and livestock products, crops contributing only between 5 and 6 per cent. The use of farm products by the household reached only 9 per cent of the total gross value, this low figure indicating their highly commercial character (Table 9).

The importance of these two groups of livestock farms in Missouri, the general and the animal specialty, is revealed by the facts that together they include almost three-fifths of all farms, al-

most seven-tenths of the farm area, two-thirds of the gross value of products, two-thirds of the investment in real estate, more than three-fifths of the milk cows, almost nine-tenths of the beef cows, more than three-fourths of the sows and gilts farrowing, more than eight-tenths of the other swine and two-thirds of the horses and mules. The remainder of these items is distributed among nine

TABLE 9.—TYPES OF FARMING IN MISSOURI¹

Types of farms	Percentages of the gross product value from					Total
	Crops	Livestock	Livestock products	Forest products	Household use	
	Percent	Percent	Percent	Percent	Percent	
General	16.2	26.0	32.1	1.8	23.9	100
Animal specialty	5.6	72.0	12.7	.5	9.2	100
Self-sufficing	25.4	10.7	19.6	1.6	62.7	100
Poultry	4.3	13.5	62.3	.6	19.3	100
Abnormal	7.1	58.8	13.3	4.4	16.4	100
Dairy	5.0	18.5	63.3	.6	12.6	100
Cash grain	64.6	12.5	10.3	.4	12.2	100
Cotton	86.4	3.1	2.5	.1	7.9	100
Fruit	71.7	5.0	10.7	.6	12.0	100
Crop specialty	73.9	9.7	6.1	.4	9.9	100
Truck	79.9	1.9	4.7	.3	13.2	100
Unclassified	—	—	—	—	—	—
Total	17.4	43.3	22.8	1.0	15.5	100

¹Fifteenth Federal Census, 1930.

TABLE 10.—TYPES OF FARMING IN MISSOURI¹

Types of farms	Size of farms		Land use—					
	Original	Revised	Harvested crops	Plowable pasture	Other pasture	Harvested crops	Plowable pasture ²	Other pasture
	Acres	Acres	Acres	Acres	Acres	Percent	Percent	Percent
General	134	134	52	24	8	39.0	18.1	6.1
Animal specialty	208	208	83	55	13	39.9	26.6	6.3
Self-sufficing	85	85	22	13	5	25.7	15.1	5.8
Poultry	93	93	32	21	6	34.1	22.4	7.0
Abnormal	56	56	13	12	4	23.1	21.7	6.3
Dairy	129	129	44	33	9	34.2	25.3	7.3
Cash grain	159	159	93	19	6	58.4	12.0	3.6
Cotton	54	275	210	10	2	76.3	3.6	.6
Fruit	83	83	34	12	4	41.7	14.9	4.9
Crop specialty	131	131	67	18	6	52.1	14.1	4.8
Truck	45	45	19	6	1	42.4	12.8	3.2
Unclassified	—	—	—	—	—	—	—	—
Total ..	132	140	56	30	8	39.0	20.8	6.0

¹Fifteenth Federal Census, 1930.

other types, thus leaving relatively small percentage figures for most of them. Although these other types are less important numerically and in terms of the area occupied, the gross value of product achieved and the investment represented, they may be very important locally as an expression of the utilization of the resources available, and for this reason are worthy of careful consideration.

The self sufficing type, the next in order of importance in terms of numbers (11.2 per cent) has land area, real estate value and gross value of product percentage figures which are all lower

than the number percentage figure. The proportion of the total gross product reported for these self-sufficing farms was in fact only one-fourth the percentage figure for the number of farms and is indicative of the low productivity of these self sufficing farms (Table 6). Although averaging 85 acres in size, they had only 22 acres of harvested crops per farm (Table 10) which, with the modest livestock numbers (Table 8), produced only \$422 of gross product per farm, or \$4.98 per acre, the lowest of all figures in these two income items (Table 7). This low productivity is associated with the lowest figures for real estate values per farm and per acre, the lowest value of buildings per farm and per acre also, while the self sufficing type is one of the three types, with lowest values of dwellings per farm. Implements per farm are lowest in value on this type (Table 7), which is in keeping with the small acreage in harvested crops, both absolutely and on a percentage basis (Table 10). The numbers of livestock are lower than average in each livestock type, most of the items being less than half the average for the State. The exceptions are milk cows and work animals, in which the numbers per thousand acres of farm land approximate the averages for all types (Table 8). As is to be expected, the products of the farm go largely to serve the household directly, only about one-third of the gross product being sold or traded (Table 9).

Farms classed as poultry in type, representing 7.2 per cent of all farms, (Table 6) are smaller than average sized units (Table 10) with modest investment and modest gross value of product (Table 7). The gross product comes largely from the livestock enterprises, more than three-fourths being so reported, which leaves but little for crops, since 19 per cent is credited to use by the household (Table 9). The size of this latter figure indicates the self-sufficing character of the usual Missouri poultry farm. Although the gross product per farm is only about two-thirds of the average for all farms, the gross product per acre is practically the average figure, indicating that the intensity of operation is higher than the per farm figure would indicate (Table 7). Despite this intensity, the size of the business is too small to give a large gross value of product, which further helps to explain why the proportion of the gross product used by the household, becomes so large a proportion of the total (Table 9). Poultry farms, as here classified, will include both the highly specialized plants given over entirely to poultry production, and with little else for sale, as well as the more general farms on which poultry production is sufficiently

important to make up 40 per cent or more of the gross product.

The abnormal farms, 6.2 per cent of all types, (Table 6) including primarily part time units, represent one of the smallest groups in terms of acres per farm, and the smallest in terms of acres of harvested crops per farm (Table 10). This small area, coupled with the limitations of management of part time units, gives a lower than average gross product per farm, but the gross product per acre is almost double that of the average (Table 7). The intensity of operation on these small units is high, but the small size restricts the total gross production. The numbers of livestock is low in all classes except milk cows; (Table 8) and perhaps poultry. The gross product is derived from the livestock enterprises to the extent of 72 per cent of the total, crops contributing only 7 per cent, while the self-sufficing elements are over 16 per cent (Table 9).

The dairy farms of Missouri, as here classified, including 6.2 per cent (Table 6) of all farms, are slightly under average in size, and for this reason occupy an area slightly less than the number percentage would indicate. They are sufficiently productive, however, to bring forth a larger than proportional gross product (Table 6). The gross value per farm and per acre are both well above the average (Table 7). Milk cows are the outstanding livestock on these farms, the 6 per cent of all farms reporting 17 per cent of all milk cows (Table 5), or 73.5 per 1,000 acres of farm land, a figure almost three times greater than the average of all types. Numbers of other cattle are also high, but the numbers of swine are more moderate (Table 8). The gross value of the products is derived primarily from livestock and livestock products, 82 per cent being so reported. Crops contribute only 5 per cent and the household elements make up 13 per cent (Table 9).

Cash grain farms are larger than average in acres (Table 10) which gives them a proportion of the farm area, which is larger than the percentage figure for their numbers. Their proportion of the real estate values is also higher, but for the year 1929 their share of the gross product is lower (Table 6). Livestock percentages other than work stock are lower on the cash grain farms than on most of the other farms. The higher workstock percentages fit their grain crop production, (Table 5) which also fits the figure of 58 per cent of their land reported in harvested crops, the second highest figure for all types. Only 12 per cent of their land area is in plowable pasture, next to the lowest figure of all types (Table 10). Evidently cash grain farms do not leave potential crop land in pasture use.

The cotton farms are, on the revised classification, the largest (275 acres) in average size (Table 10). Although cotton farms represent but 1.1 per cent of all farms, they include twice that proportion of the area (2.2 per cent) and more than five times that proportion of the gross value of products (5.6 per cent). Their proportionate part of the real estate value is double their number percentage figure (Table 6), and their proportionate part of the workstock numbers is almost four times their number percentage (Table 5). Cotton farms report 43.6 head of workstock per thousand acres of farm land, the highest figure of all types, and especially high compared with the state average of 24.7 (Table 8). The large number of work animals is the result of the share-cropper tenant organization, that is, the "one negro-one mule" type of operation. Their large size and high productivity give these farms the largest gross product per farm and per acre and the largest real estate values per farm. Their investment in buildings, though the highest per farm, is, owing to their large acreage, the lowest per acre. Because of the many cropper tenant houses the figure for value of dwellings becomes the highest per farm of all types. Implements per farm also run higher here than on other types (Table 7). Numbers of livestock are among the smallest for all types (Table 8) but these farms are first in terms of harvested crops per farm (Table 10) and the percentage of land in harvested crops and last in percentage of land in plowable pasture (Table 10). Cotton farms are not organized to use pasture, and land which is plowable is put into crops.

The fruit farms, although not important numerically since they represent only 0.9 per cent of all types, (Table 6) have a number of interesting characteristics. They are among the smaller sized in acreage, with a low figure for harvested crops (Table 10) and a gross product figure per farm only slightly above average. Their intensity of operation gives them a much higher than average gross product per acre, although the per farm value is but a trifle over average (Table 7). The numbers of livestock other than milk cows are low on the fruit farms (Table 8), the livestock enterprises contributing only 16 per cent of the gross value of products, while the crop enterprises are credited with 72 per cent (Table 9).

Crop specialty farms, representing but 0.8 per cent of all farms, (Table 6) are those in which a variety of crops other than the specialties already reported (cash-grain, cotton, fruit, and truck) may contribute to the gross value of the products. These are po-

tato, tobacco, or soybean selling farms, or possibly other less prominent though locally important crops. These farms are just average in size, with area, real estate value and gross product value proportions practically equal to the number percentage figure (Table 6). Land in harvested crops makes up more than half of the total, land in plowable pasture less than one-seventh (Table 10). The gross product per farm and per acre are just about average (Table 7). Numbers of livestock are low on the crop specialty farms, (Table 8) crops accounting for the largest part of the gross product (74 per cent) the livestock enterprises contributing only about one-fifth of the proportion from crops (16 per cent) (Table 9).

Truck farms representing the smallest percentage of all types numerically (.6 per cent) (Table 6) are the smallest also in terms of acres per farm (Table 10) but have the highest gross product per acre, the highest real estate value per acre, and the highest value of buildings per acre (Table 7). Numbers of livestock on truck farms are low (Table 8). The gross product per farm is under average, which is to be expected because of the small size, despite the high gross value per acre (Table 7). Crops account for 80 per cent of the gross product, livestock enterprises being but 7 per cent, while the self sufficing elements are 13 per cent (Table 9). The small size and high real estate values are in keeping with their specialized production, which is usually in connection with a location near a city.

The Location of the Different Types of Farming

The relative proportions of the types of farming just described and the location of the centers of density of each are shown in Figures 26, 27 and 28. The most striking example of the localization of a type is that of the cotton farms which are concentrated in southeastern Missouri (Fig. 27). Although very much smaller in terms of numbers the fruit and truck farms also show a distinct regionalization, being limited almost entirely to the areas adjacent to the three large cities and to a number of southwestern Missouri counties. Dairy farms show a much more scattered distribution with a concentration near Kansas City, St. Joseph and to some extent adjacent to other and smaller cities, while a very definite and much larger area of concentration is visible in southwestern Missouri. Oddly enough St. Louis does not have a dairy farming area in Missouri judged by the absence of dairy farms in its environs (Fig. 26).

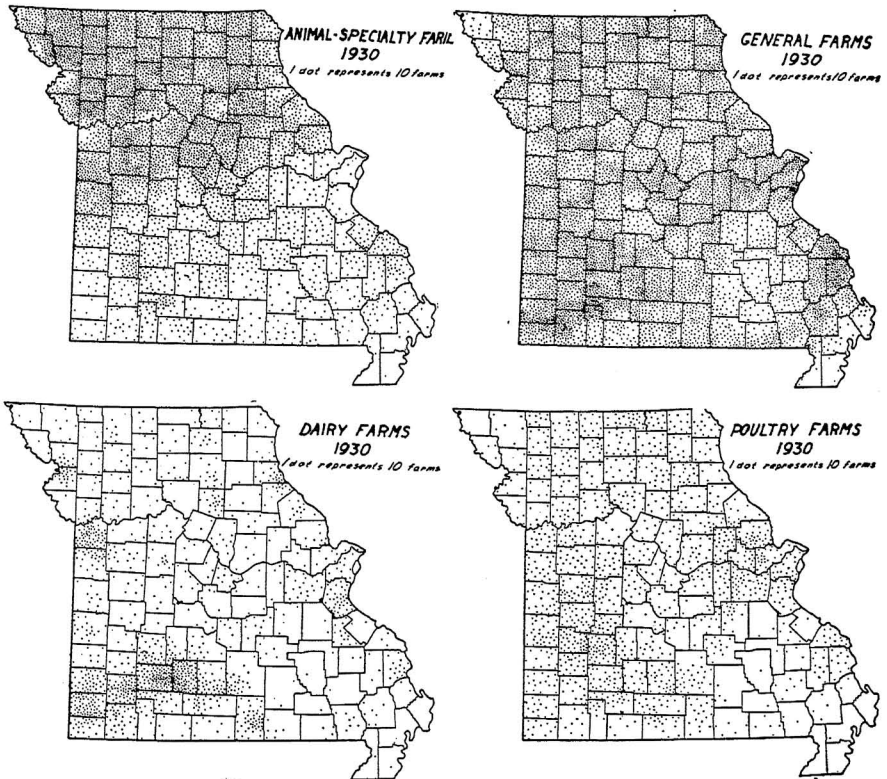


Fig. 26.—Animal specialty farms are more numerous in the northern part of the state; dairy farms in the southwestern part and near the cities; general farms are well scattered but are least numerous in the Ozarks and southeastern Missouri; poultry farms appear more numerous in the western part and near St. Louis. The Ozarks have few poultry farms.

Cash-grain farms reveal an interesting concentration along the two major rivers; the Mississippi and the Missouri, and in southeastern and in southwestern Missouri (Fig. 27). Crop specialty farms show considerable scatter but a small area of concentration is to be seen in western Missouri (Fig. 28). Animal-specialty farms are present in a very evident and relatively dense blanket over the northern and west central parts of the state, and are relatively absent in the southern part. The southeastern lowland has practically no animal-specialty farms (Fig. 26).

Poultry farms are more scattered although an area of density appears in southwestern Missouri and another in east central Missouri. The Ozarks and the southeastern lowland are conspicuously low in numbers of poultry farms, while the area of animal-special-

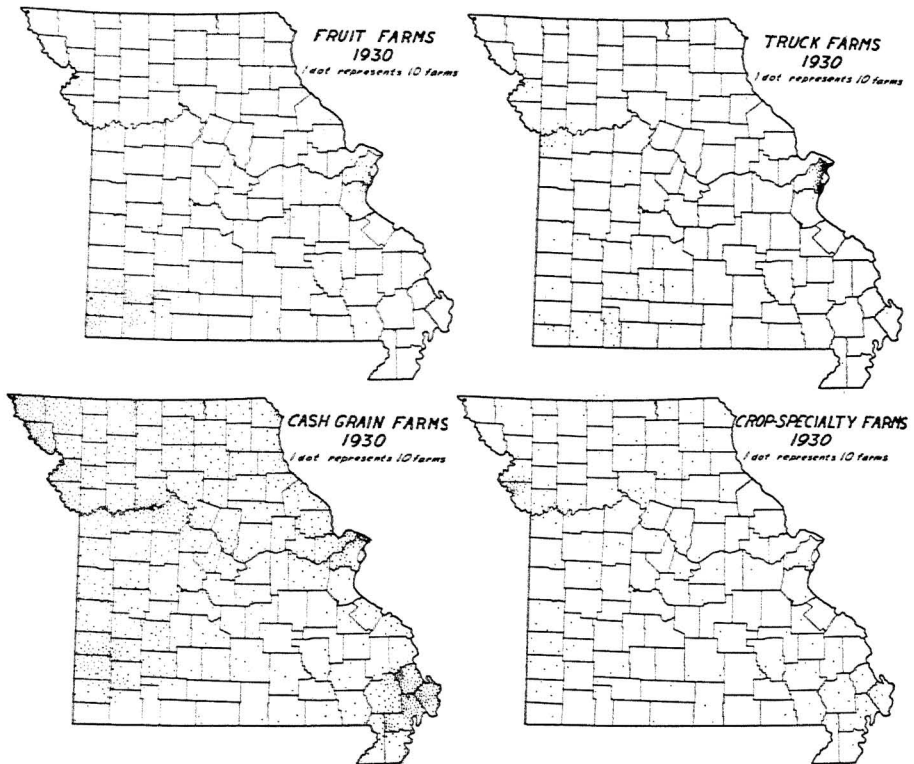


Fig. 27.—Fruit and truck farms are more numerous near the cities and in southwestern Missouri; cotton farms are concentrated in the southeastern lowland; cash grain farms appear most numerous in southwestern and southeastern Missouri and along the major rivers.

ty farms north of the Missouri River is only thinly interspersed with poultry farms (Fig. 26). Self sufficing farms appear well distributed over the southern part of the state, but only scattered numbers appear in the northern part and in the southeastern lowland (Fig. 28). Abnormal farms (largely part-time farms) show centers of concentration near the larger cities and a scattered but relatively greater density in southern Missouri. The southeastern lowland and northern Missouri have few abnormal farms. General farms, the largest of all types, are scattered over the state in a fairly uniform fashion but are relatively few in number in the southeastern lowland, the Ozark, and some of the northwestern counties (Fig. 26). The unclassified farms likewise seem to be concentrated in a few places as Fig. 28 shows.

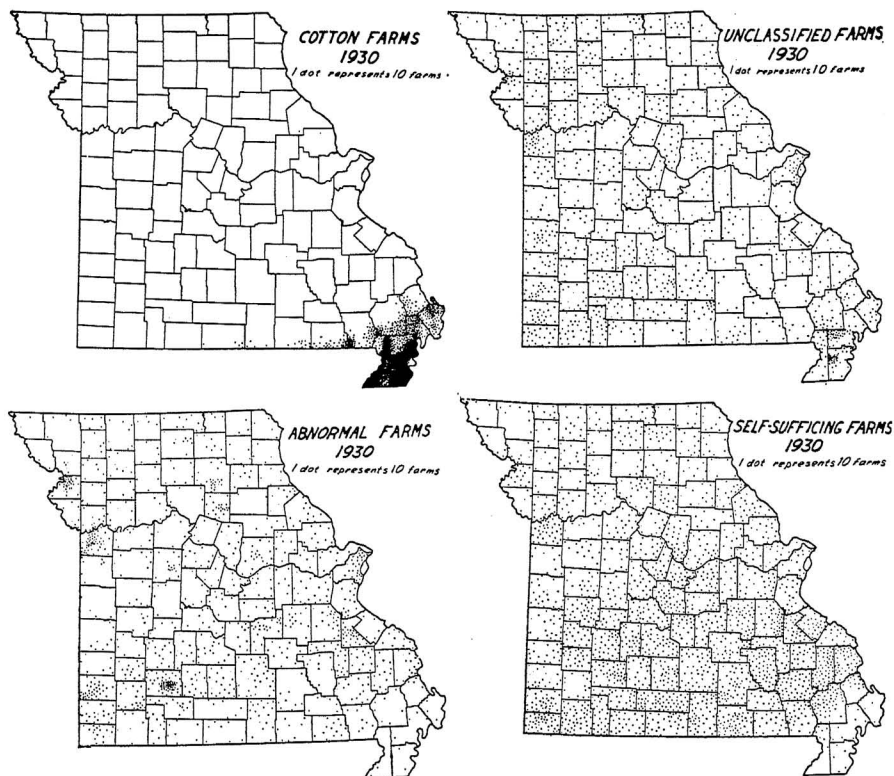


Fig. 28.—Crop-specialty farms appear to be concentrated in western Missouri; self-sufficing in southern Missouri; the abnormal near the cities and in southern Missouri; the unclassified more or less scattered.

REGIONAL SPECIALIZATION

As Indicated by Census and Other Statistical Data

An inspection of the various elements already given describing the agriculture of Missouri, the physical and other characteristics of the State, and this distribution of farming types reveals a number of striking correlations between the crop and livestock distributions, the types of farming and the characteristics of the State described under the "Forces Influencing Differences in Missouri's Farming."

Cotton.—The production of cotton (Fig. 4), is concentrated in the southeastern lowland. The cotton type of farm is limited to this area also (Fig. 27). But this southeastern lowland area grows considerable corn which, however, is not associated with livestock as is usually the case in Missouri (Figs. 4, 12 and 13).

Cotton farms dominate in the lowlands whether viewed in terms of numbers, the area occupied, the gross product value achieved, or the real estate values involved (Table 6). The gross product is first of all from crops, livestock having little or no place in the farming. It is an area in which cotton and corn are grown to the exclusion of practically all other crops, a situation traceable to a location in the fertile alluvial lowland. Here the fertility is high, the growing season long and the production of cotton physically feasible. Usually cotton is the crop which brings the largest farm returns also, but when the price of cotton falls to such low figures that corn production becomes relatively more profitable these farms can produce corn, their organization being such that corn fits well their land, labor and power resources. But corn when grown here is a cash crop, partly because of the normal absence of livestock and partly because of the difficulty of securing additional livestock in years of abnormally high corn production. The lowland areas, furthermore, face difficulties in livestock sanitation and hygiene and the risk of overflow and attendant financial loss. These facts combine to reduce the incentive to engage in livestock enterprises. Or, put in another way, the farmers in this area have resources which ordinarily permit them to organize farms based on a crop raising and selling plan without livestock.

Fruit and Truck.—The production of truck crops (vegetables for sale) (Fig. 7) and the production of fruits (orchards, vineyards and planted nut trees) is concentrated near the larger cities and in southwestern Missouri. These areas are also the location of the truck and fruit farms (Fig. 27). The number of these farms is only a small proportion of the total number in the counties in which they are located. They occupy but a very limited proportion of the total farm area and represent but a modest part of the gross value of product and the farm investment values in these same counties. They are, however, much more important locally than these county proportions would indicate (Table 6).

Near the cities the truck and fruit farms develop in response to the favorable price influences of the urban market. Ordinarily sufficient areas of favorable soil with suitable topography and adequate climatic conditions are available in the state, so that the physical factors are not the limiting factors. Instead the limits are set by the prices which consumers must pay for these perishables and semi-perishable products to insure a supply if brought from areas farther away. These prices have been the incentive

which induced some of the nearby farmers engaged in other types of farming to change their type of farming or to sell out to the other farmer who operated these truck and fruit units, which usually are smaller in size, as already shown in the analysis of the characteristics of the various types (Table 10).

Adjacent to St. Louis and to a lesser extent near Kansas City and St. Joseph, as well as some of the other cities of Missouri, are found enough of these farms influenced by urban conditions to justify designating these areas as truck and fruit areas, or perhaps as areas of urban influence.

The area in southwestern Missouri which produces fruit and vegetable crops has adopted this type of cropping for other reasons than those directly influencing the areas closer to the cities. Here the opportunities in other crop and livestock types of farming are limited by reason of rough topography, thin soils and distances to market, particularly as the latter are affected by transportation difficulties. Products of the fruit and truck crop type, intensive in character, using relatively little land but much labor and paying high returns, offer an inducement to these farmers with available family labor, limited land area, and few profitable enterprises to which to turn. The production of fruit crops including tree fruits as apples, or small fruits as strawberries, and vegetables as tomatoes is undertaken on very rough land and stony soils, but this seems to be a paying venture for many of these small farmers in contrast to their other opportunities. Transportation is a problem for many of them, but lacking better paying alternatives, these transportation difficulties are overcome by the application of much effort, time, and patience.

Tomatoes are grown in these southwestern Missouri counties for local canning and for shipment to other areas as well. The local canneries are small units representing a modest investment, which generally pay sufficiently well to induce the canning factory operator to continue, though in recent years some of these small plants have stood idle.

The southwestern part of the state may be blocked off as having a truck and fruit growing type of farming, not to the exclusion of other types, nor to the extent that this dominates the other types, but to the extent that it plays a part in the farming, which is relatively and in some cases absolutely greater than is the case in other parts of the state.

Dairying.—A concentration of dairy farming appears near the larger cities as Kansas City and St. Joseph, as well as near the

smaller cities as Hannibal, Moberly, Springfield and Jefferson City. There is a further concentration in the southwestern part of the state overlapping to some extent the area of fruit and truck crops already outlined there. Interestingly enough, relatively few dairy cows appear in the vicinity of St. Louis (Fig. 12). Farms classed as dairy type appear in these same areas near the cities and in the southwestern part of the state (Fig. 26). There are two counties in which dairy farms represent the major proportion numerically, but these percentages are not very large, Jackson county (Kansas City) having but 19 per cent of its farms classed as dairy farms, while Webster county in southwestern Missouri reports 36 per cent. The percentages for numbers of dairy farms are not large anywhere, the figure of 36 per cent in Webster county being the largest of all counties, but the proportions in the counties containing the larger cities and in the above mentioned area in southwestern Missouri are considerably higher than those in other parts of the state. The proportions in the southeastern lowland for example are under 1 per cent, in the northwestern part of the state they run from 1 per cent to 3 per cent, while in the counties with cities the figures are 6 per cent to 10 per cent or higher.

Thus, although dairy farms do not outrank other types numerically in very many counties the areas already suggested are given over to dairy type farms sufficiently to designate them as dairy farming areas in contrast to the other parts of the State.

The place of dairy farming in the territory adjacent to the cities is much the same as that of the fruit and truck farms. The local market, the favorable facilities for shipment and, above all, the inducements of price lure producers close to the point of consumption in the case of cities. In the case of southwestern Missouri, where the production of milk and other dairy products goes considerably beyond the needs of local consumption, dairying fits the utilization of land suited to pastures and crops on modest sized units where transportation facilities are good and where market outlets of the larger sort, such as condenseries and creameries, have been established. This area in southwestern Missouri with both dairy and fruit farms may be termed a dairy-fruit type of farming area or a fruit-dairy type of farming area.

Wheat.—Wheat growing appears to be concentrated along the two major rivers, the Mississippi and the Missouri, and in a limited area in southwestern Missouri. Along with wheat these areas grow considerable corn and both crops are commonly marketed directly or as cash-grain (Fig. 27). Numerically, cash-grain farms are

not very prominent in Missouri, but in the northwestern part of the state bordering the Missouri River and in the southeastern part, particularly in Scott, Mississippi and New Madrid counties and in the southwestern part of the state the percentage figures for cash-grain farms are higher than is the case in neighboring counties. These areas can be designated as areas of wheat and corn production or wheat and corn cash-grain farming.

The production of wheat appears on the soils adjacent to the rivers for two different reasons. The Knox soils (or Memphis in the eastern part of the state) are of loessial origin. They occur on the steep slopes and often erode badly when cropped too heavily to intertilled crops such as corn. Yields are good when these soils are handled carefully. The use of wheat, an autumn seeded crop, tends to check winter erosion, and undoubtedly the favorable yields of wheat pay as well as would the yields of corn which could be obtained were the lands now seeded to wheat to be included in the corn cropping.

An entirely different reason is responsible for the cropping to wheat on the alluvial clay soils of the Wabash series. These bottom land soils are heavy and are worked with difficulty, tending to become cloddy even under careful treatment. Corn which yields well when the soils are handled at the right time does not do well when the opposite is the case. Seeded to autumn sown wheat these fertile soils, even if cloddy, mellow down during the winter and produce good crops, the returns from which compare favorably with the returns possible from this same land were it planted to other crops. The loamy, friable and more easily worked soils, often adjacent to the heavier clay soils, are on the other hand more often given over to corn. This soil situation added to the difficulties faced by farmers in lowland regions with reference to livestock sanitation and hygiene, and the risk of loss from overflow tends to direct the systems of farming into a crop growing and selling type without livestock, hence the cash-grain farms.

Exceptions to this situation are to be found in the case of the narrower bottoms which belong to farmers who also have upland, or the case of the upland farmer who happens to be near enough to the bottoms so that his farm area includes bottom land soils. Here the livestock kept on the upland will be fed with the crops grown on the bottoms resulting in the organization of a livestock type of farming.

The areas of broad bottoms may be termed cash-grain or cash-crop type of farming areas. Often these areas are so narrow as

to defy the delineation on a small map, yet they are there nevertheless.

Potatoes and tobacco are grown commercially in the west central part of the state in an area of crop-specialty farms (Fig. 7 and 2S). A few crop-specialty farms are also located in the southeastern part of the state. The latter are the result of specialization in some locally important crop such as soybeans for seed, cowpeas or sunflower seed.

The development of a type of farming based on potatoes in west central Missouri is in part the result of a favorable urban market outlet, and in part the result of favorable soil conditions. The mellow, loamy soils in the Missouri River valley near Kansas City produce good crops of potatoes, which early found an outlet in the local Kansas City market. The development of this territory into a producing area going beyond the local needs is in part the effect of the efforts of a few energetic individuals, in part the natural working out of favorable price and growing conditions. The Missouri River valley possesses much more soil which is suited to potatoes than can profitably be grown to the crop at this time. Growers in the favored locations with selling organizations, or with peculiar advantages of some sort, are the ones, therefore, who are likely to continue in the production of this specialty.

Much the same situation exists in the case of tobacco. Missouri has plenty of land suited to tobacco culture, if it is established that this crop pays in competition with other crops which can be grown on the same land. At present the tobacco crop is grown on farms producing other crops and some livestock as well. Tobacco occupies only a small acreage per farm. Usually the cured tobacco is shipped by truck to Kentucky market centers, much of it being hauled to Lexington. The yields are good, the quality fair to good, and under present conditions some farmers find it pays to grow tobacco. On the farms where tobacco receipts made up 40 per cent or more of the gross value of product, tobacco obviously occupied a large place in the farm business, even though the acreage was small.

The proportion of the state included in the crop specialty farms is so small that the designation of a type-of-farming area on the map is difficult, but the type of farming is a fact and the local area is there nevertheless. In the vicinity of Orrick, in Ray county, the growing, handling, and marketing of potatoes is so all important that it dominates the psychology and conduct of all the farmers spreading into neighboring areas to some extent also.

The Ozark area, especially the rougher parts, report but few farms, little cropping, and only limited numbers of livestock. The Ozark area, however, reports a large proportion of its land area in woods (Figs. 1, 7, 12 and 13). The topography in this area is rough, the soils thin, and transportation commonly difficult. For these reasons the farming opportunities are modest and the character of the farms takes on a non-commercial aspect. The farms classified in the census as the self-sufficing are located here to a large extent (Fig. 28). The numbers of farms in the Ozark counties, though not as large absolutely as in the more favored agricultural counties, are largely self-sufficing, seven counties reporting self-sufficing farms as the majority in type, while adjoining counties report large percentage numbers of self-sufficing farms, especially when compared to counties in the more productive areas of the state.

Self-sufficing farms are the result of the limited productivity of the area with topography, soils and transportation difficulties such as prevail here. Areas such as this offer an appeal to some people and are a haven to others because of the modest demands upon them. The cropping is limited to the better patches of soil on bottom or hillside and always includes a large proportion of corn, which is used for human food directly as well as for the mule, the pig or two and the few head of chickens which make up the local livestock. Sheep are absent on these farms. Milk cows are present but are often mixed with the beef breeds. Little commercial production is attempted or is feasible; barter of eggs, poultry and garden products, for instance, representing a large part of the farm business with the outside world. Gardens for home use are important on these small farms, and some wood cutting such as firewood, ties, and mine props has a place also. Work in other occupations is available to some of these small farmers.

Scattered through this self-sufficing area of the Ozarks are instances of individuals with larger areas of upland or with larger areas of bottom land or favorably located hillsides. These individuals with the productivity of more land serving one family represent the scattered instances of general farms, and also of animal specialty farms shown in this area in Fig. 26. Given greater gross crop productivity, a greater livestock productivity is possible also and the farming goes beyond the self-sufficing stage. Distance from market and the type of cropping physically feasible favor a livestock type of farming. The type usually followed is the production of beef, which utilizes the rough woodland pasture or feeder hogs which utilize the limited concentrates of the farm and the

forest mast. Some dairying is attempted also. The Ozark area may be termed first of all a self-sufficing type of farming area, and next a meat producing type of farming area with, however, a recognition of differences of a major nature between the meat production here and that in northern and northwestern Missouri, where crop production is on a very different basis.

Livestock.—The animal specialty, that is, the livestock type of farm and the second largest group, is located to a large extent in the northern and western part of the state. This is the area of ample corn and hay production and the location of the largest numbers of hogs, beef cattle, and sheep. This is also the area of the fertile Marshall and allied loessial and glacial soils and the Summit residual limestone soil. These soils are highly productive, and coupled with a topography which is not too unfavorable to machine operation, have induced the organization of large farms growing much corn, some small grain and considerable hay which is fed to livestock, particularly hogs and beef cattle. In the portions farther east where the soils are less fertile and the production of corn somewhat lower more grass enters the farming and beef breeding herds become important; the numbers of hogs declining with the smaller production of corn. In a few counties as in Worth and in Schuyler the production of grass is associated with large numbers of sheep. These animal specialty farms are in reality composed of a number of different types, the corn-hog farms of the Marshall soils and the corn-hog-beef feeding farms of the Marshall and Shelby soils contrasting with the hay producing-beef-breeding-herd farms farther east on the less productive Putnam and Lindley soils, or the pasture-sheep producing farms of the Grundy and allied soils in Schuyler and adjoining counties. For most of these farms the production of feed for livestock is of first importance, hence the absence of wheat in the farming system. Wheat yields well on many of these soils and could be fitted into the farming following oats, but this would reduce the area in corn and thus conflict with the livestock program. In other ways also the farm program would become more complex. Labor, power, and equipment needs would be changed and a marketing problem would be added as well for often wheat receiving grain elevators are not always available. The relatively high cost of seed wheat per acre compared to the lower cost of planting an acre to corn may be advanced as an argument in areas where the gross returns from corn and wheat, acre for acre, are not very

different. Some wheat is grown in the area and a few cash grain farms are found in every county, but their number and their proportion of the total is so much lower than the number of animal-specialty farms that the area is correctly classed as a livestock or a meat producing area. The presence of deviations from the generally prevalent type are the result of local but important deviations from the usual forces acting to determine the type, and these differences in type may be quite proper deviations for the conditions which prevail.

The animal specialty farms are the result: (1) of a location on soils of higher productivity and an organization of larger units; (2) of a type of organization suited to the utilization of a fertile soil which responds to the alternation of an intertilled crop as corn with small grains and forage; (3) of the feed grains supplementing the hay and pasture in livestock feeding, the pasture forage particularly aiding in maintaining the yields of crop on the harvested acres, while at the same time furnishing valuable feed for livestock and reducing the operating costs of the farm.

General.—The largest group of all Missouri's farms is the general type. This group is scattered over the state to such an extent that the designation of a general type of farming is not feasible. General farms are often farms which are in reality some other type, but with a low degree of specialization. In Missouri most of the general farms are livestock in character. However, these general farms are much smaller, less specialized and less productive, as a rule, than are the larger animal-specialty farms. In some instances the general farms may be dairy or crop-specialty or cash-grain in type because several important enterprises contribute very nearly equal parts to the gross product of the farm. The general farms are, in part, the result of less favorable conditions of a physical character, such as soils of less productivity or topography, which is less favorable for machine cultivation, or they may be located so that the usual specialty such as fruit or truck or dairying may be out of the question, thus forcing the farming into a more diversified program. Many general farms are too small to undertake the livestock specialization found on the larger animal specialty farms, or they may be handicapped by lack of capital, lack of managerial capacity, or there may be other reasons which tend to dictate a "middle-ground" type of farming with a number of income producing enterprises, thus distributing effort and risk. This plan is probably safer for many of these farmers than would be an attempt to follow a high degree of

specialization which may, at times of price disadvantage, lead to financial loss.

The delineation of the areas shown in Figs. 37 and 38 must be accepted with a distinct recognition that these areas represent the present aspect of a changing picture. Further, it must be understood

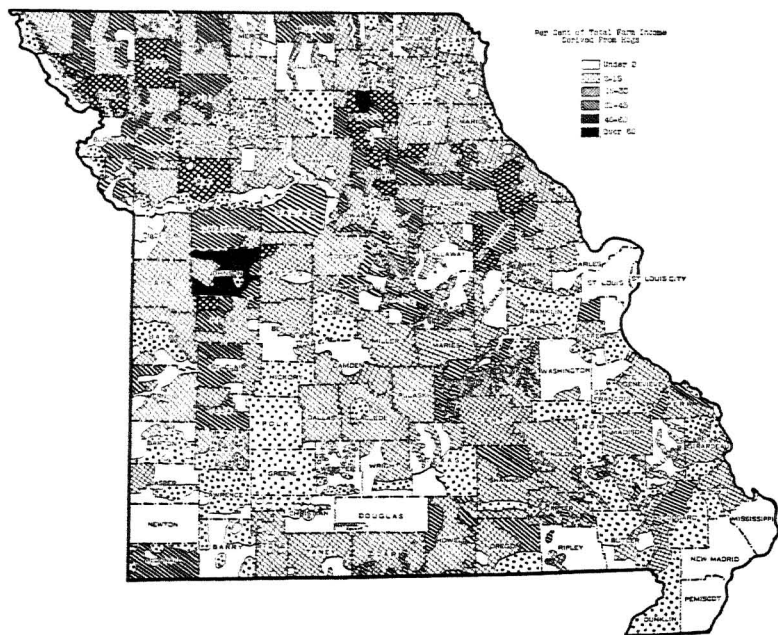


Fig. 29.—As a source of income the production of hogs is most important in northern and western Missouri where most of the corn and small grain is produced and where feed is more abundant. In some counties of the Ozarks also, hog production is important but in these areas production is of the stocker type of hogs, normally sold to other areas to be fattened before being sold in the consumer markets. (Figs. 29-36, inclusive, prepared by the Department of Agricultural Economics, Missouri College of Agriculture, from information furnished by county agents, county adjustment committees, vocational teachers, and others, 1936).

that the designation of any type-of-farm area does not prohibit the inclusion within the area of other types of farms as already stated. When the local conditions in any type-of-farm area, for instance, become definitely cash-grain in character, someone will very likely find that it pays better to farm in the cash-grain type rather than in the other type, and thus the local deviations from the generally accepted type come into being.

As Indicated by Local Observation

It is recognized by students of the subject that there are certain defects in the approach to type-of-farming boundary deter-

mination through the use of census statistics alone. County boundaries and township boundaries are artificial political divisions, and, as has already been pointed out in earlier pages, soil, topography and other features are of greater significance in the determination of type-of-farming divisions. Recognizing this fact but taking account also of the circumstance that statistical reports are available only for political subdivisions, an attempt has been made to construct helpful type-of-farming maps without supporting statistics but with the substitution of observation and close acquaintance with communities for these statistical data.

The basis of the division of the following maps showing the importance of various sources of income within as well as between counties, is the observation and intimate acquaintance with their counties of county agents, county conservation and adjustment committees, vocational agriculture teachers and others. The data were obtained by asking county agents and others to outline upon a county map, provided for the purpose, the type-of-farming areas for their respective counties. The boundaries must be recognized as only approximations, but that the various enterprises do exist in the communities indicated and in the approximate importance indicated in the legend there can be little doubt. Therefore, it would seem that the greater detail shown in these maps than could possibly be provided by dependence solely on census statistics should be of interest and value in acquainting the reader with the major activities of the various communities making up the counties and the state. Preparing separate maps for every single enterprise would be impracticable for presentation in this study. Therefore only the major sources of income, or groups of sources, have been given the dignity of a map all their own.

The basis for the divisions that are given upon the various maps is one of estimates. The boundary lines of the individual areas are admittedly approximate. Furthermore even in areas of heaviest dependence upon some particular farm enterprise some farms will be found depending upon it not at all. But one can expect to find in such areas that the enterprise in question is in general of major significance. Those areas left clear are not necessarily entirely devoid of the particular enterprises in question; but in these areas this enterprise occupies a position of small or negligible significance.

There are certain advantages which seem to have been gained by this type of approach. Even moderate acquaintance with the diversity of farming types in Missouri leads to a questioning of

the accuracy of placing any particular county in its entirety within a particular type-of-farming area. For illustration it is well known that there is little or no significant difference in the kind of farming followed in the southern part of Saline county and the northern part of Pettis, or in the northern edge of Jasper and the southern edge of Barton counties. Yet when county statistics must be used the preponderance of evidence that other parts of these counties differ widely, forces the placing of these counties in different categories. The ignoring of county boundaries in this particular approach, therefore, makes it unnecessary to draw a type-of-farming boundary line where none really exists.

Figure 29 shows the approximate percentage importance of the farm's income derived from the sale of hogs. Two or three points in connection with this figure need to be mentioned. First, the river bottom areas along the Missouri and Mississippi rivers are noticeably lacking in income from hogs, as are also the areas adjacent to larger cities and the cotton counties in Southeast Missouri. Second, certain areas in the Ozark region depend heavily on hogs and are noted for the production and sale of stock hogs to feeders in areas producing abundant corn. Third, in the dairy, poultry and fruit areas of Southwest Missouri pork production also occupies a minor position. Fourth, the level to gently rolling Putnam silt loam area in Northeast Missouri depends to a large degree on the sale of pork for income and finally northwest Missouri is known to be a heavy producer of pork, but produces great quantities of beef, dairy products and even cash grain as well so that the percentage of income derived from hogs is not necessarily great. In very few sections in Missouri does the hog enterprise produce a half or more of the total farm income.

The distribution of the beef enterprise, as indicated in Figure 30, bears a close resemblance to that of the hog enterprise. The areas of great dependence upon hogs in South Missouri and North Central Missouri are also regions of heavy production of stocker cattle. In northwest Missouri a heavy production of corn and small grain permit the finishing of large numbers of both hogs and beeves. Dairying on the other hand competes more directly with beef than it does with hog production so that great dependence upon dairying is incompatible with any considerable production of beef other than that arising as a by-product of the dairying itself.

The farm poultry enterprise, Figure 31, is fairly well distributed throughout the entire state with the exception of the southeast cotton counties. It is probably true that the importance of the

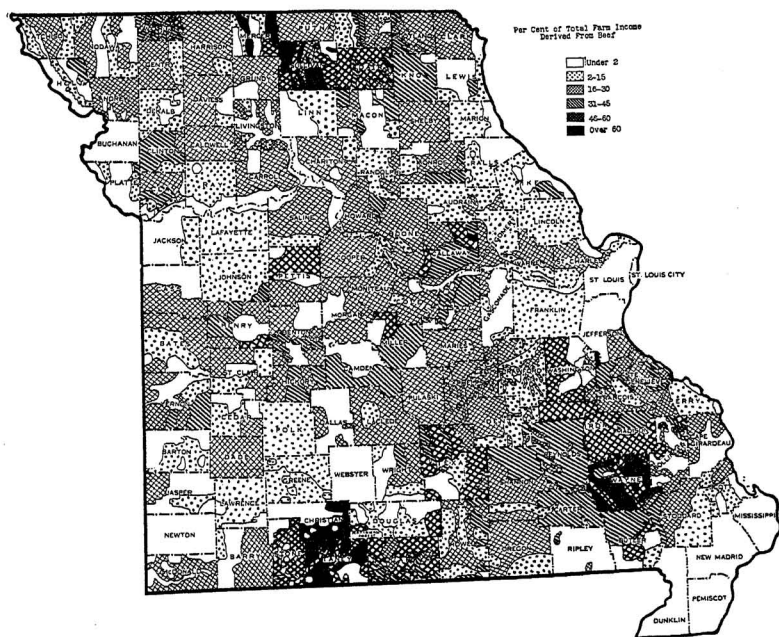


Fig. 30.—The dependence upon beef production as a source of farm income is greatest in a small group of counties in the north central part of the State, and in certain southern and eastern Ozark counties.

poultry enterprise has often been underestimated as a source of income by farmers and others because of the fact that poultry products are so often exchanged for groceries and little record of any kind is assembled concerning the magnitude of the exchange. Areas of relatively heavy dependence upon poultry stand out clearly though there are a few areas in the state where as much as 30 to 45 per cent of the income is from poultry, and only one small region in St. Clair and Cedar counties where poultry income constitutes as much as one half of the total farm income.

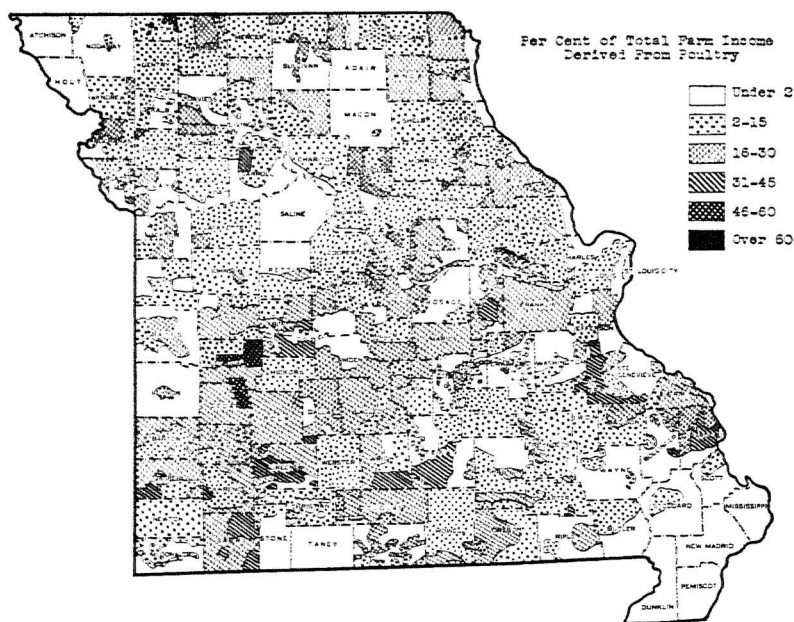


Fig. 31.—Poultry are rather well distributed in Missouri though the percentage of farm income derived from poultry is heaviest in the Ozark and Ozark border counties.

The map, Figure 32, showing the importance of the dairy enterprise is probably subject to the same criticism mentioned in connection with the poultry maps, namely that on farms not strictly dairy farms the dependence on income from the dairy enterprise may easily be underestimated. However, this map is believed to show reasonably well the variation in emphasis on dairying in various parts of the state. The dairy business in Missouri is concentrated in the plateau region in the southwest part of the state, in a rather narrow strip running from Jefferson county north to Marion, excepting St. Louis county, and a strip running through Jackson and Johnson counties in the neighborhood of Kansas City, with a small region east and north of St. Joseph. Comparing this map with that showing the beef cattle enterprise will emphasize the fact that in Southeast Missouri, aside from the cotton belt, and up through Central Missouri the large acreage of grazing land is utilized by beef rather than by dairy animals.

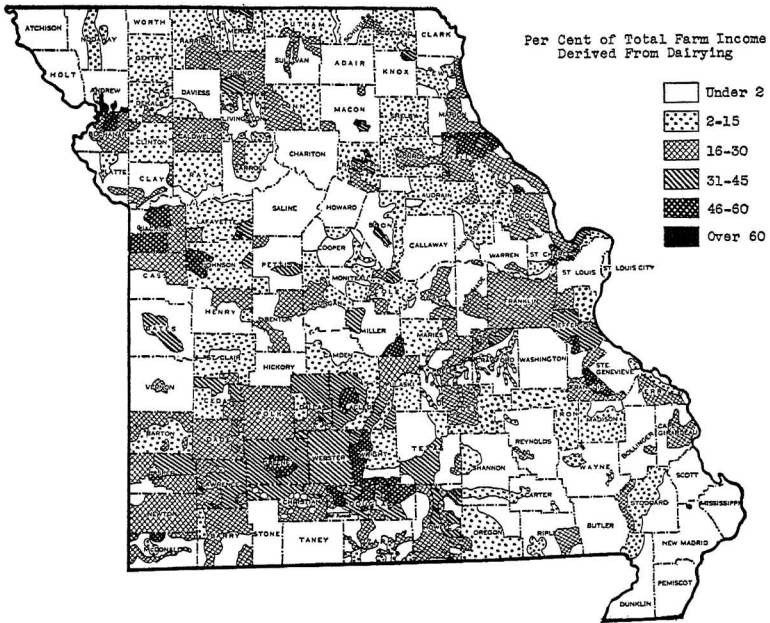


Fig. 32.—There are many small areas in Missouri where dairying is of considerable importance as a source of farm income. These small areas are usually found in connection with some more than usually large town or city though the St. Louis milk shed is located chiefly in Illinois. The really great dairy area of Missouri, not occurring in connection with a nearby urban population, is that in the southwest Ozark plateau area, centering about Lawrence, Greene and Webster counties.

The location of the sheep enterprise in Missouri is indicated in Figure 33. In very few spots in the state do farmers depend on sheep for more than about 15 per cent of the farm income. There is a small region in southern Callaway county, one in Daviess county, and one in Schuyler where the sheep enterprise is of greater importance. In a good many counties of the state there is only a trace of mutton and wool production.

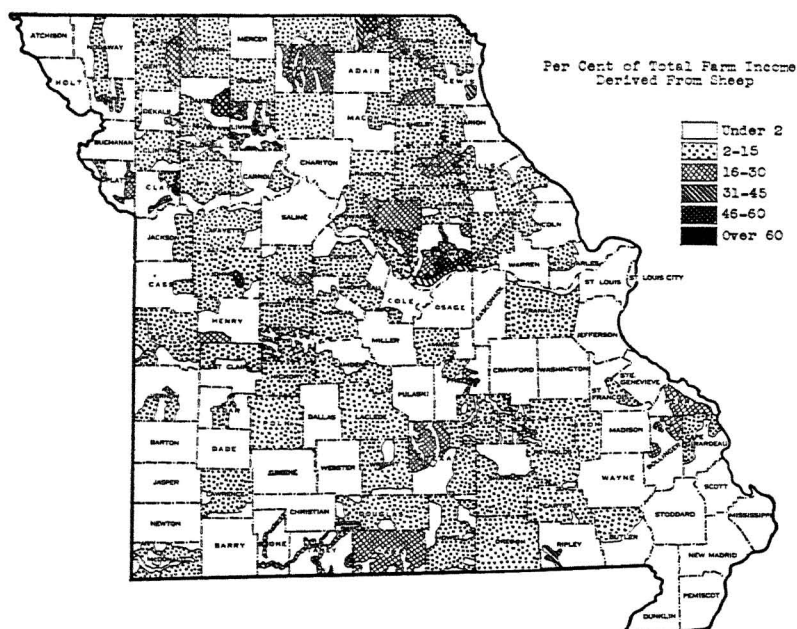


Fig. 33.—Sheep are rather irregularly distributed in Missouri and nowhere of exceptional importance. In only a few small areas does the income from sheep amount to 50% of the farm income.

The foregoing maps give a picture of the importance of various classes of livestock in producing income. There are considerable regions in Missouri which depend largely on the sale of cash crops. The importance of cash sales of corn and small grain is indicated in Figure 34.

As might be expected river and creek bottoms furnish most of these cash grains. The bottoms of the Missouri and of the Mississippi are of greatest importance but the Grand River bottom, stretching from Chariton county on to the northwest furnishes much grain as well. The prairie regions of western Missouri, including parts of Cass, Bates and Vernon counties, produce much cash grain also and are an eastward extension of a similar type-of-farming area in Kansas. The shadings indicate that some grain is sold even from the Ozark Plateau counties and from the Northeast Missouri prairie lands. The number of bushels marketed for cash from these latter two areas is not large, but farm incomes are not large and grain sales do occasionally make up a sizeable percentage of the total farm income. The southeast Missouri delta

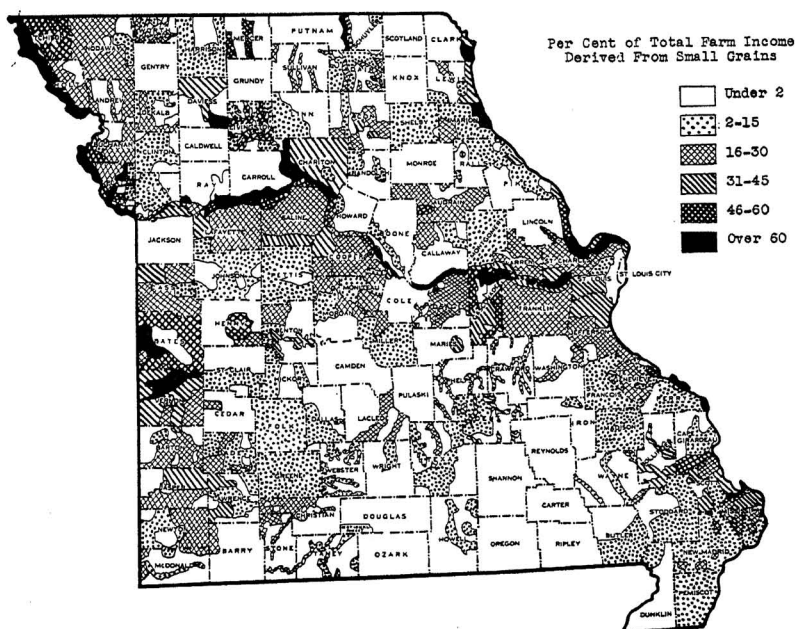


Fig. 34.—The cash sale of corn and small grain as a source of farm income is most important along the bottom lands of the Missouri and Mississippi rivers. There is, however, a cash grain area of considerable importance located in Bates and Vernon counties.

counties are important cash grain producing areas. Atchison county in northwest Missouri is the heaviest producer of corn to be sold directly. In Carroll and Chariton counties more of the cash sales of grain are of wheat.

The importance of cotton as a source of cash income is indicated in Figure 35. Missouri has only a few counties which can grow cotton, but these counties are rather highly specialized in this type of production. Stoddard, New Madrid, Pemiscot and Dunklin counties are the heavy cotton producing counties. The southern edge of Butler county and a small area in two or three other south border counties are about as heavily specialized. On the other hand farming in Mississippi and Scott counties is more diversified with cash grain and even livestock locally important.

The location of the fruit areas in the state are indicated on Figure 36. There are three really important fruit raising sections. One is the rather large area in Southwest Missouri, centering in Newton, McDonald, Barry, Christian and Webster counties. The

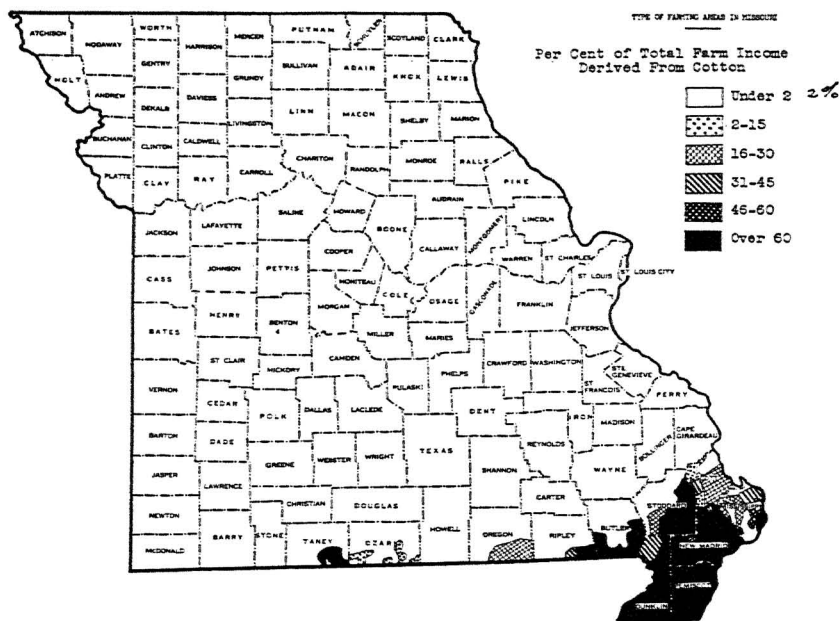


Fig. 35.—Cotton is grown in only a few counties of Missouri but in those counties it constitutes a major source of farm income.

other is on the border of the Missouri River beginning about Boone county and extending westward and northward to the Iowa boundary and including the important fruit sections tributary to St. Joseph and Kansas City. The third area centers about St. Louis. Other isolated spots are of considerable significance. The ones in Phelps county are grape areas. In Stone county tomatoes are produced for canning. Sullivan county also has a cannery interest. The areas in Scott and Mississippi counties are mostly devoted to watermelons. Butler county and some small spots in Reynolds are tree fruit and melon areas: while Dunklin county also produces considerable quantities of melons.

To one interested in special enterprises or in special sections of the state the foregoing figures should give some information of inter-county or sectional developments in the way of specialized farm enterprises which maps based on county census figures could not possibly give.

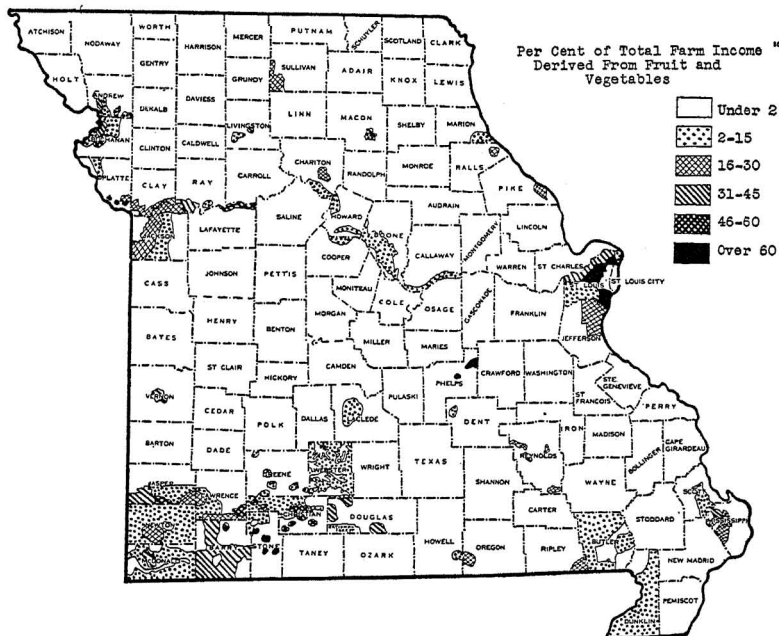


Fig. 36.—The areas devoted to fruit and vegetable production are small and scattered. At times, however, these small areas are highly specialized in this type of production so that a considerable percentage of the farm income is derived from the sale of fruit and vegetables.

TYPE-OF-FARMING AREAS IN MISSOURI

The usual end product of a type-of-farming study has been the division of the state into a relatively small number of type-of-farming areas and it has been toward that end that this study has, in part, been working. No such areas can be drawn that will quite do reality justice since, as the preceding sections show, farm types in Missouri are complex and greatly intermingled. The general type of farm is the most common and most widespread in Missouri. Upon such farms are to be found a mixture of a great number of crop and livestock enterprises. Few genuinely broad areas where the combination of enterprises upon farms are notably uniform occur. However, certain areas of dominance of particular types-of-farming do occur and it is to the delimitation of these areas of dominance that we turn in this final section of the study.

Two versions rather than a single version of the type-of-farming areas are given in Figures 37 and 38. Figure 37 presents a less

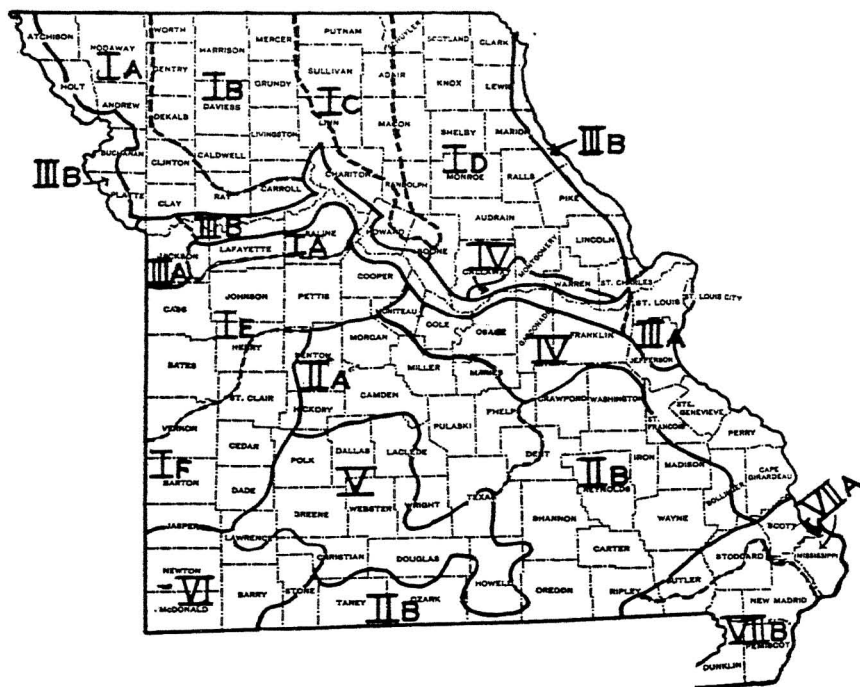


Fig. 37.—In the above version of the types-of-farming areas of Missouri, county lines have been respected. That is, each county is included as a whole in the dominant types-of-farming area to which it most nearly belongs.

- | | | |
|--|--|--|
| I. Northern and Western
Meat Production | II. Ozark Meat Production | V. Ozark Plateau Dairy
and Poultry |
| A. Marshall | A. Clarksville-
Lebanon | VI. Southwest Fruit, Dairy,
and Poultry |
| B. Grundy-Shelby | B. Clarksville-
Huntington | VII. Southeast Lowlands
Cash Crops |
| C. Shelby-Lindley | III. Cash Grain, Truck and
Fruit (Suburban) | A. Northern Corn,
Cotton, and Wheat |
| D. Putnam-Lindley | IV. Ozark Border Dairy and
Wheat | B. Southern Cotton |
| E. Summit | | |
| F. Cherokee-Bates-
Oswego | | |

accurate and slightly less detailed division than Figure 38. It (Fig. 37) has the virtue, however, that the divisions for the type-of-farming areas coincide with county lines. So many farm statistics are reported upon a county basis that some such division, respecting county lines, is advisable so that the type-of-farming areas may be used in conjunction with these county figures.

In Figure 38 the divisions coincide much more nearly with actual type-of-farming boundaries. The detail is somewhat greater also in that a long and tortuous area following the outer boundaries of the river bottoms and river bluffs along the two major water courses, the Missouri and the Mississippi rivers, is given. This area is composed of a narrow strip of land seldom more than 25 or 30 miles wide, and usually much less, that could not effec-

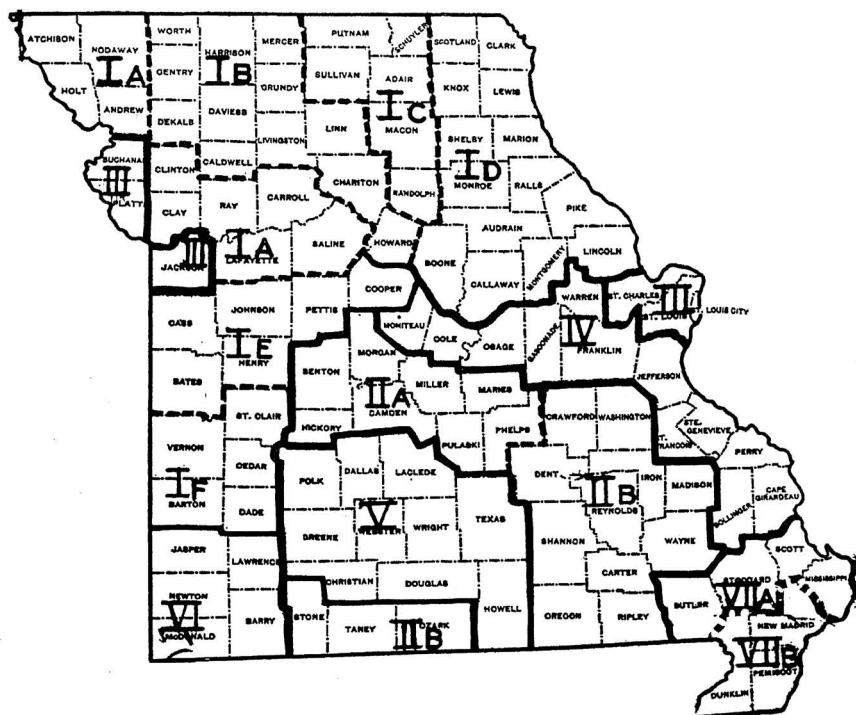


Fig. 38.—Types-of-farming areas in Missouri based upon dominant types of farm organization and enterprises.

- | | | |
|--|---|---|
| <p>I. Northern and Western Meat Production</p> <p>A. Marshall</p> <p>B. Grundy-Shelby</p> <p>C. Shelby-Lindley</p> <p>D. Putnam-Lindley</p> <p>E. Summit</p> <p>F. Cherokee-Bates-Oswego</p> | <p>II. Ozark Meat Production</p> <p>A. Clarksville-Lebanon</p> <p>B. Clarksville-Huntington</p> | <p>IV. Ozark Border Dairy and Wheat</p> <p>V. Ozark Plateau Dairy and Poultry</p> <p>VI. Southwest Fruit, Dairy, and Poultry</p> <p>VII. Southeast Lowlands Cash Crops</p> <p>A. Northern Corn, Cotton, and Wheat</p> <p>B. Southern Cotton</p> |
| | <p>III. Cash Grain, Truck and Fruit</p> <p>A. Suburban</p> <p>B. River bottoms and river bluffs</p> | |

tively be separated out in the preceding map which honored the county lines. The total acreage of the strip is, however, considerable and its farming types sensibly different from those of adjacent areas.

The Major Areas

The state has been divided into seven major areas and four of these major areas have been sub-divided. Both major and sub-areas are listed below.

- I. Northern and Western Meat Production.
- A. Marshall
- B. Grundy-Shelby

- C. Shelby-Lindley
- D. Putnam-Lindley
- E. Summit
- F. Cherokee-Bates-Oswego
- II. Ozark Meat Production.
 - A. Clarksville-Lebanon
 - B. Clarksville-Huntington
- III. Cash Grain, Truck, and Fruit.
 - A. Suburban (Kansas and St. Louis Sub-Areas in Figure 37)
 - B. River bottoms and river bluffs. (Given in Map Figure 38 only)
- IV. Ozark Border Dairy and Wheat.
- V. Ozark Plateau Dairy and Poultry.
- VI. Southwest Fruit, Dairy, and Poultry.
- VII. Southeast Lowlands Cash Crops.
 - A. Northern Corn, Cotton, and Wheat
 - B. Southern Cotton and Corn

The great bulk of farms in Missouri are engaged in the production of meat products and fully two-thirds of the entire state falls into two great meat production areas: (1) the Northern and Western Meat Production Area, and (2) the Ozark Meat Production Area. The production of meat is also important in the Ozark Border Dairy and Wheat, the Ozark Plateau Dairy and Poultry, and the Southeast Fruit, Dairy and Poultry areas. It is of much lesser importance in the Cash Grain, Truck, and Fruit and in the Southeast Lowlands Cash Crops areas.

The Ozark Meat Production Area is set up as a major division and separated from the Northern and Western Meat Production Area for four major reasons. In the first place, the meat animals marketed from the Ozark Meat Production Area are stocker and feeder animals intended almost universally to be finished in other areas of more abundant feed grain production before being sent to slaughter. Second, while the Northern and Western Meat Production Area is one of commercialized farming in which production is for sale in the general market, Ozark farming is of a much more nearly self-sufficing type with a large portion of the production consumed directly upon the farm. Third, much of the land in the Ozark Meat Production area, particularly in the Clarksville-Huntington sub-area, is unsuited to agriculture and either has been or should be used chiefly for timber production. Indeed, much of the future use of land in these two areas will be for for-

estry and in a number of the counties of this area more than 75 per cent of the land is at present not owned by farmers at all. By contrast farmers own or use less than 90 per cent of the total land area in very few counties of the Northern and Western Meat Production Area. Fourth, while farming in most areas in Missouri, and particularly in the Northern and Western Meat Production Area is reasonably well mechanized it is, in the Ozarks, still to a notable extent upon a handicraft basis. Indeed, throughout all Ozark type-of-farming areas and even in the Southeast Lowlands Cash Crop Area the mechanization of agriculture is notably less than in the areas to the north and west. The crop land upon farms of the entire Ozark region is limited and the fields not only small but the preponderance of them are located upon land too sloping for effective mechanical tillage. In the Southeast Lowlands the reason for the lack of mechanization is somewhat different and arises because of the fact that cotton culture has not so far proved itself well adapted to machine operation.

The third major area is a Cash Grain, Truck, and Fruit Crops Area located either immediately adjacent to the two metropolitan centers, St. Louis and Kansas City, or along the bluffs and bottom lands of the two major water courses of the state, the Mississippi and Missouri rivers. Two small sub-areas, one tributary to St. Louis and the other to Kansas City, have been provided. In these sub-metropolitan divisions the production is more largely of truck crops for the immediately adjacent market than is true for the remainder of the area. The variety of truck crops grown is also greater in these two sub-metropolitan areas. Along the river bluffs the production is chiefly of fruit crops with occasional small areas of tobacco. In the bottom lands, on the other hand, the production is chiefly wheat and corn intended for the cash grain market, or such staple truck crops as potatoes, sweet potatoes, and to a much lesser extent, cabbage.

The fourth, fifth, sixth, and seventh major areas are, respectively, (1) the Ozark Border Dairy and Wheat Area, (2) the Ozark Plateau Dairy and Poultry Area, (3) the Southwest Fruit Dairy and Poultry Area, and (4) the Southeast Lowlands Cash Crops Area. The reason for making these areas major divisions will be apparent from the description of them that is given in connection with the discussion of area crop and livestock combinations given below.

Area Type of Farming Characteristics

The Northern and Western Meat Production Area.—The sub-areas of the Northern and Western Meat Production Area were distinguished to begin with chiefly upon the differences in the major soil types as will be noted by the names that they were given. However, when soil types differ, topography, which is a close relative of the soil, usually differs as well, and these two in turn lead to differences in intensity of land use and in the combinations of farm enterprises.

Marshall Sub-Area.—Thus the Marshall sub-division of the Northern Meat Production Area is a section of excellent upland soils: unquestionably the most productive upland soils of the entire state. Land values consequently are high. The major crops in the Marshall sub-area are corn, oats, and other feed crops. Of these much the most dominant in terms of acreage is corn. In a number of the counties of this area, for instance, corn is grown on from 30 to 45 per cent of the crop and pasture land area of the farm. In no other section of the state is the amount of land devoted to corn so great. And in no other upland section of the state are the crop yields so universally high. Furthermore, the soils and topography are well adapted to the production of such high quality legumes as alfalfa and sweet clover so an abundance of carbohydrate feeds may be easily supplemented by legume roughages of high protein and mineral content.

Because of the heavy production of corn and other feed grains and roughages livestock enterprises thrive in this area. The concentration of beef cattle and hogs is the heaviest for the entire state and, because of the preponderance of corn, the ratio of hogs to beef cattle and other stock is greater than elsewhere. Furthermore, the finishing of the animals is, on the whole, carried farther in this area than anywhere else in the state. Part of the high finish of animals in this area is put on with imported feeds, particularly corn. This corn is purchased chiefly from the river bottom lands that adjoin the Marshall area along a great front.

Grundy-Shelby Sub-Area.—The Grundy and Shelby soils approach but do not equal, on the whole, the Marshall in fertility. The topography of the Grundy is quite the equal of or superior to that of the Marshall but that of the Shelby is not. Erosion becomes a much more serious problem on the Shelby soils which dominate this sub-area and this fact restricts the crop acreage in relation to the pasture acreage as compared to the Marshall area. Furthermore, while the dominant crop enterprises are feed grains

particularly corn, the yields of these are not as high as in the Marshall area. Likewise alfalfa and sweet clover are much less advantaged and pastures are not as good chiefly because bluegrass does not do as well.

The combination of livestock enterprises reflects these differences in soils, topography, and productivity. Livestock numbers per unit of land are not as great and because of the heavier acreage of pasture the grazing animals, particularly cattle, are more numerous in relation to hogs than in the Marshall area. Furthermore, because of the lesser production of feed grains the finishing is commonly not so fine. Not unusually indeed more cattle are started on grass than can be finished on feed so that the area is in part a supplier of stocker and feeder cattle to areas with heavier grain production. That is, the cow and calf enterprise is more important in relation to the steer (and heifer) feeding and finishing enterprise than was the case upon the Marshall soils. Some corn and other feed is imported for feeding but this area is farther from sources of supply than is the Marshall area and the practice is therefore less common.

Shelby-Lindley Sub-Area.—As was the case for the preceding area, the Shelby soils are the dominant soil in this area. However, associated with the Shelby in this area is the Lindley which is even more rough, broken, and erosive than the Shelby and much less fertile, whereas the associated Grundy in the Grundy-Shelby region is superior to the Shelby. As a consequence the acreage of corn and other feed grains declines while the acreage of hay and pasture increases as compared to the Grundy-Shelby. Hogs give way still further to grazing animals, particularly cattle, and because of the lack of feed grains meat animals are less well finished as a rule than in either of the preceding areas and the volume of stocker and feeder cattle shipped to other areas for finishing is relatively greater. The cow and calf enterprise is increasingly dominant over the finished beef enterprise. The percentage of farm land in pasture is higher in the Shelby-Lindley Area than in any other of the subdivisions of the Northern and Western Meat Production Area.

Erosion in this area is rated by Dr. Baver as the most serious for the entire state. He states,

“Slopes on the Lindley Loam vary considerably from 5 per cent in Boone county to 20 per cent in Adair and Sullivan counties. The average will be somewhere between 12 and 17 per cent. The Lindley Loam is perhaps the most severely eroded soil in the state. Originally it was timbered with white and other oaks. After the timber

was cut and the land cultivated it did not require much time to lose most of the original 8 to 10 inches of surface soil. The strongly rolling to hilly topography as well as the subsoil cause rapid runoff of rainfall and excessive losses of soil. At the present time practically all of the Lindley soils that have been cultivated have lost over three-fourths of their original surface and are now less than 4 inches in depth. The general infertility of the remaining surface soil and the heavy nature of the exposed subsoil classifies the Lindley Loam as one of the most difficult to handle from the standpoint of its conservation.¹"

Because of the excessive erosion in this area the drift of the types-of-farming upon these Lindley and associated Shelby soils will probably be toward an increasing emphasis upon pasture and hay crops and hence increasingly toward the grazing type of animal.

Putnam-Lindley Sub-Area.—The Putnam and the Lindley soils are widely different. The topography of the typical Lindley is hilly while that of the typical Putnam is smooth and in places nearly level. The Putnam is not, however, a highly fertile soil being in that respect well below the Grundy and the uneroded Shelby, though definitely superior to the Lindley. The pasture acreage in this area is less in relation to the acreage of crop land than in the Shelby-Lindley and not much different from that of the Grundy-Shelby area. The emphasis upon corn is below that of the Marshall and the Grundy-Shelby areas but above that of the Shelby-Lindley area. A relatively large acreage is sown each year to oats.

Both because of the imperviousness of the subsoils of both Putnam and Lindley soils and because of their lack of calcium the more deeply rooted and productive of the legumes, alfalfa, is unadapted to this area. For protein production farmers turn to soybeans which, though they grow successfully, do not produce the volume of forage that can be made with alfalfa on the Marshall. In general, the volume of feed crop production is less than that in the Grundy-Shelby area and the pastures have a lesser livestock carrying capacity. Consequently the livestock population, while much alike in composition to that of the Grundy-Shelby is less dense than in this latter area. The smaller numbers of livestock are approximately as well finished by grain feeding as are those marketed from the Grundy-Shelby areas.

Summit Sub-Area.—Summit soils are not unlike in topography and general fertility to the Grundy. However, the soils associated

¹L. D. Bayer, "Soil Erosion in Missouri", University of Missouri Agricultural Experiment Bulletin No. 349, pp. 35, 36.

with the Summit, that is, the Pettis, Boone, and Oswego, are generally inferior to those associated with the Grundy, that is, the Shelby. The general level of the productivity of the Summit sub-area is therefore considered to be somewhat below that of the Grundy-Shelby area to the north. The difference is perhaps not great but that there is a difference is borne out by the general level of corn yields which is, on the average, lower in the Summit than in the Grundy-Shelby sub-area.

The utilization of land for crops and pasture is quite uniform from county to county. In the Summit area, as a whole, approximately 30 per cent of the crop and pasture area is employed for corn production, somewhat over 10 per cent for oats, about 5 per cent for wheat, with pasture upon approximately 40 per cent of the area as noted in Figure 39. The livestock populations are in composition not dissimilar to those of the Grundy-Shelby area though there is a somewhat greater emphasis, on the average, upon hogs and a somewhat lesser emphasis upon the beef and dairy enterprises.

The finishing of the livestock is carried to about the same stage as it is in either Grundy-Shelby or Putnam-Lindley areas. Only the exceptional feeder attempts to place a high finish upon his cattle and when he does so is usually found to be importing corn for the purpose. A considerable number of cattle are marketed as stockers or feeders or as grass-fat butcher stuff.

Cherokee-Bates-Oswego Sub-Area.—The level of soil fertility declines rather definitely from the Summit to the Cherokee-Bates-Oswego area so that the production of feed crops is much less than in the Summit area. The Cherokee and Oswego soils have heavy impervious subsoils and are, like the Putnam, unsuited to the raising of the deep-rooted legumes such as alfalfa. In fact, the production of crops high in protein and minerals has unquestionably held down the livestock populations in this area and it is notable that there are less hogs, less cattle of all kind, less sheep and goats, and even less poultry per unit of land in this area than in any of the other sub-areas of the Northern and Western Meat Production Area.

In fact, the difficulty in raising legume supplements has been credited with leading the farmers in the Cherokee-Bates-Oswego area to sell a relatively high proportion of their cereal crops on the cash grain market. On the whole, the percentage of crops marketed directly is somewhat larger in the Cherokee-Bates-Oswego area than in the not dissimilar Putnam-Lindley area which in turn

accounts, in part, for the much lower livestock numbers maintained in this area relative to the Putnam-Lindley area.

In part also the low numbers of livestock result because of the low yields of corn and feed grains generally. Yields in this area are lower than in any of the preceding areas that have been discussed.

The Ozark Meat Production Area.—The Ozark meat production area has been divided into two sub-areas, namely the Clarksville-Lebanon and the Clarksville-Huntington areas. In the first of these two,—the Clarksville-Lebanon,—farming still clings to the plateau uplands while in the Clarksville-Huntington area it is concentrated to a much greater degree upon the bottom lands. The general nature of the terrain in the Clarksville-Huntington area is so rough, so hilly, and so stony that agriculture upon the uplands is essentially precluded. In the Clarksville-Lebanon area, on the other hand, are to be found much more considerable stretches of reasonably smooth plateau lands that may be and are farmed. In brief, the agriculture of the Clarksville-Huntington area is a valley land agriculture to a much greater extent than in any other section of the state.

Clarksville-Lebanon Sub-Area.—Both Clarksville and Lebanon soils are relatively infertile. The Lebanon is counted as one of the least fertile soils of the state but has the advantage that it is a plateau soil, stone free, and has a relatively smooth topography. The Clarksville is somewhat less infertile than the Lebanon but is gravelly or downright stony and occurs universally upon slopes or very narrow ridges. Its topography, therefore, is much less favorable to agriculture than that of the Lebanon.

Because of the low yields of these relatively infertile soils the production of feed and forage crops is low. Low farm incomes reflect the low quality of the land. The pasture land acreage is greater in relation to crop land in this area than in any of the sub-areas of the Northern and Western Meat Production areas. Consequently the numbers of hogs are low in relation to the numbers of cattle, the finishing of livestock, particularly cattle, is carried on almost not at all, and not only cattle but hogs as well are marketed chiefly as stockers and feeders to be finished in regions of more plentiful feed grain production. In part, the hogs of this areas feed upon acorn mast which affects the quality of the resulting meat, making it a soft fat rather than a hard fat pork. Soft fat hogs are discriminated against for slaughter but not as feeders and for this reason, too, hogs from this section are sold

chiefly to northern feed lots for finishing. During the process of finishing they not only are given added weight but the quality of the meat is improved because of the change of feed from nut mast to cereal grains with the consequent hardening of the fat.

The region is relatively poorly developed from a transportation viewpoint and has few important local markets. For this reason dairying has not developed in the Clarksville-Lebanon area to the degree that it has in the regions of not dissimilar soils in certain of the counties of the Ozark Plateau Dairy and Poultry Area.

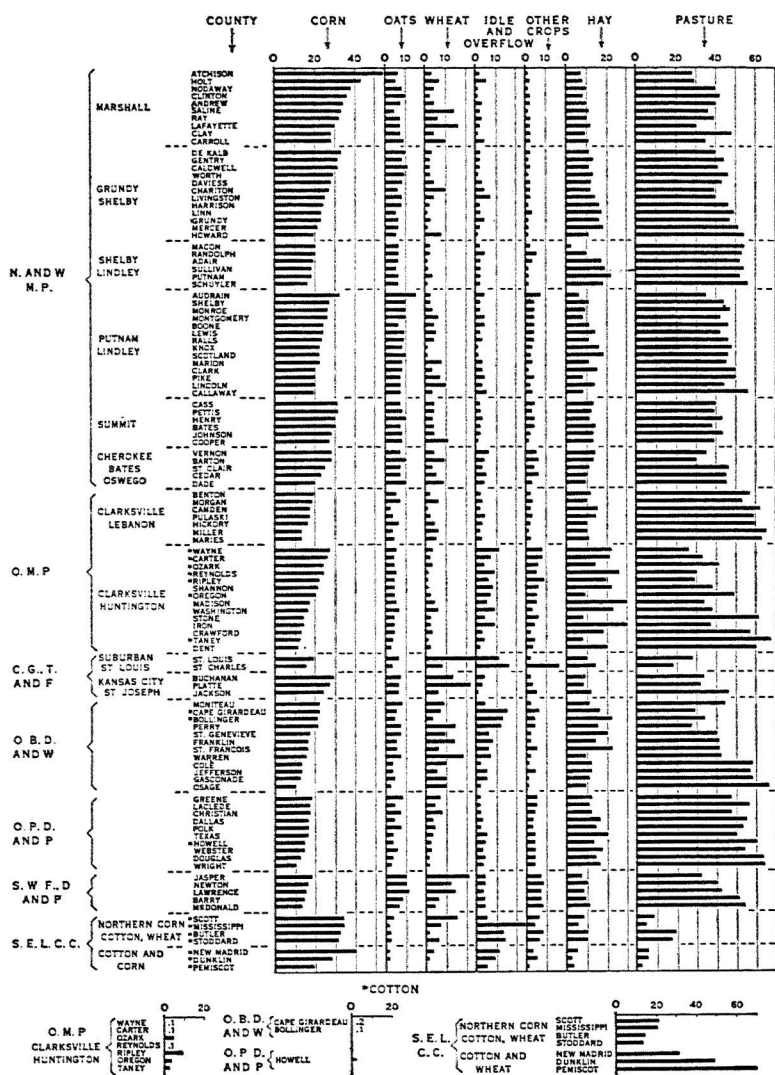
Clarksville-Huntington Sub-Area.—The proportion of self-sufficing farms in the Clarksville-Huntington area is the highest for the state. A great share of the farm production in this area is consumed directly upon the farm and cash incomes are, as a consequence, much the lowest, on the average, for the entire state.

Because farming is concentrated almost solely upon the valley lands and because these are relatively fertile, per acre yields of most crops are not as low as might at first be judged. It is the total production of townships or counties that is low rather than the production per acre of the land employed for crops. The percentage of the crop and pasture land planted to corn is actually greater in the Clarksville-Huntington area than in the preceding Clarksville-Lebanon area but, because farming is almost wholly upon valley lands, the percentage of crop land in the "idle and overflow" category (see Figure 39) is very heavy. Hay acreage is, on the average, about equal to the corn acreage and in many counties greater than the corn acreage. The percentage of speciality crops of various kinds is considerable.

Pasture land in farms is low relative to crop land as compared to that of the Clarksville-Lebanon area but this fact results almost wholly because of the abundant use that is made of free range (see Figure 41). In actual fact, therefore, the pasture acreage in relation to crop land is actually much higher in this area than in any other area in the state.

Even more than in the preceding Clarksville-Lebanon area hogs and cattle in this region are marketed as feeder stock. The percentage of hogs that forage upon acorn mast is also greater and the need for a period of finishing before marketing for slaughter is even more pronounced.

Forestry in relation to agriculture is more important in this area than in other areas of the state and the ratio of receipts from timber marketing to other farm income is consequently higher. The potential importance of forestry may be judged by the fact that



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Fig. 39.—Percentage distribution of crop and pasture acreage by counties in Missouri type-of-farming areas. The data are for the years 1924-28 inclusive and the percentage figures representing in each instance the percentage of the area of crop and pasture land in farms. Data were furnished by the Cooperative Crop Report Service, E. A. Logan, Senior Statistician, in Charge.

75 per cent of the land in such counties as Reynolds and Carter is not owned by farmers and that less than 10 per cent of the land in much of this entire area is used for crop production.

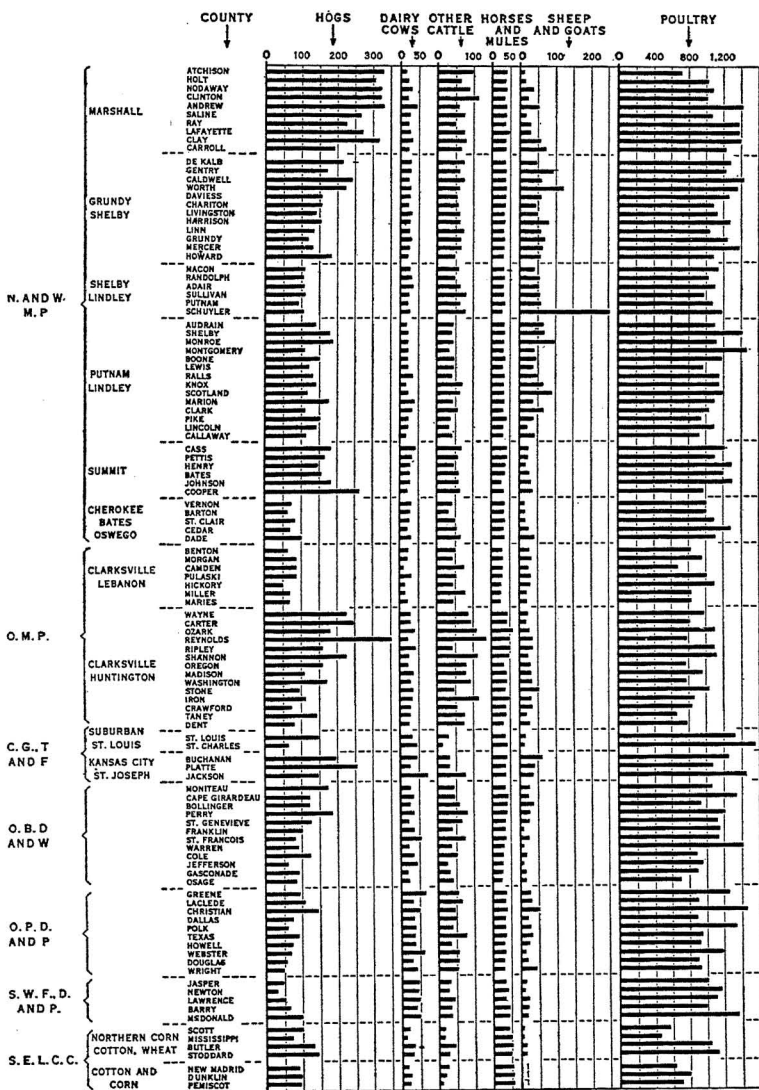


Fig. 40.—Numbers of farm animals by counties in each type of farming area in Missouri. Numbers are averages for the years 1925-29 inclusive as reported in the Missouri State Farm Census prepared under the direction of E. A. Logan, Senior Statistician.

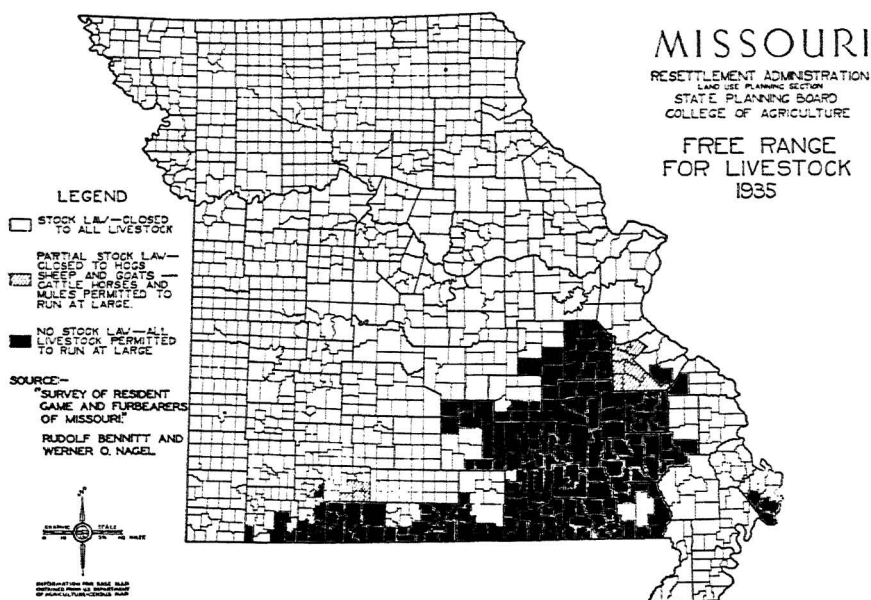


Fig. 41.—In a number of counties in the Central and Southern Ozarks livestock may still range over a portion or all of the area of the county at will.

The Cash Grain, Truck and Fruit Area.—For the most part, the Cash Grain Truck and Fruit Crops area is located on river bottom and river bluffs (or river hills) lands. The exceptions occur in the immediate regions of the two cities of St. Louis and Kansas City and to a much lesser extent, St. Joseph, where the area is broadened to reach a considerable distance from the river.

Production in this area is almost universally of crops for the cash market though on the river hill lands the roughness of the topography necessitates the use of much land for pasture. Furthermore, upon the relatively fertile bottom lands production is almost wholly of staple grain and truck crops with the preponderance in wheat and corn while upon the adjacent hill lands and areas tributary to the major cities it is more largely of the specialized truck crops for the metropolitan or city markets. In addition, however, there are specialized areas of fruit and vegetable production. Relatively large orchard areas are to be found, for instance, near St. Joseph, Kansas City, in Howard and southern Boone counties, in St. Louis county, and in Pike county. A specialized Irish potato-growing section is located in the vicinity of Orrick in Ray county. Smaller and less well known local centers of fruit and

vegetable production occur at other points in the area. Intermixed with the truck crop production near Kansas City and St. Joseph is a considerable amount of dairying. Dairying is of less importance in relation to truck and cash grain crops near St. Louis. The St. Louis milk shed is located more nearly across the Mississippi in Illinois and in the Ozark Border Dairy and Wheat Area farther west and south.

The Ozark Border Dairy and Wheat Area.—The soils of this area are residual (developed in place from the weathering of underlying rock material) and are dominantly a Union silt loam. There are, however, important areas of Hagerstown and Tilsit soils in the eastern and southern parts of the area. The Hagerstown soils are superior to the Union and are found in large areas in Cape Girardeau, Perry and St. Francois counties. The Tilsit is about the equal of the Union and occurs interspersed with both Union and Hagerstown soils along the eastern border of the area. In Moniteau county, on the western extremity of the area, the Oswego soils are of considerable importance.

The topography of the area is such that, while most of the land is in farm ownership, the proportion of raw and unused land in farms rises to 20 per cent as compared to less than 10 per cent in any of the preceding areas except those of the Ozark Meat Production Area where the proportion is still higher. It is, on the whole, sharply rolling and in places distinctly hilly. Crop acreages per farm are restricted and fields commonly small and irregular so that machine cultivation is under some handicap.

Pasture and hay crops dominate the system of land use and occupy, together, about three-fifths of the crop and pasture acreage. While corn remains the major field crop, the acreage of wheat more nearly equals that of corn than in any of the sub-areas of the Northern and Western Meat Production area.

There are two reasons for the relatively large wheat acreage. First the Union soils belong to the so-called brown soils of Missouri and these soils are used, wherever they occur, for wheat, having, apparently, some peculiar adaptability to this crop. A further factor is the presence on these lands of a group of German farmers who are, in Missouri, proverbially, disposed towards wheat as a cash crop.

The livestock system is a mixed one but leans more heavily on dairying than any of the areas previously discussed. The ratio of dairy cows to other cattle in this area during 1924-1928 was about one dairy cow to every one and one-half head of other cattle while

in the meat production areas the ratio ran persistently less than one to two.

This relatively greater dependence on dairying results from a number of reasons. First, good markets are available in St. Louis, Jefferson City, Cape Girardeau, and the towns of the Lead Belt.¹ Second, the crop acreage per farm averages distinctly less than in any of the Northern and Western Meat Production Sub-Areas. With small crop acreages it behooves that each acre be given a relatively intensive use or that some other outlet for labor be afforded. Dairying affords a means to both such ends. Third, the nature of the topography of the area necessitates keeping much of the land in pasture. And, lastly, the poor adaptability of the area to corn is less of a handicap to dairying than it would be to the production of hogs and beef cattle.

Ozark Plateau Dairy and Poultry Area.—Soils of this area are mostly the Clarksville and Crawford gravelly loams and the Lebanon silt loam. The Crawford soils are superior to the Clarksvilles or Lebanons and it is upon them that cultivation in this area is most intensive. They are found in the western end of the area in Greene, Lawrence, and Polk counties.

While general farms are more numerous in this area than dairy farms, the dairy cow population per one thousand acres of crop and pasture land is the heaviest in the entire state. Most general farms in this area keep dairy cows though in lesser numbers than are kept upon the true dairy farms. Because of the large number of general farms, meat production rivals dairying in the area as a whole, and supplants it as a major source of farm income upon farms located at any considerable distance from market. The outer, particularly the eastern, edges of the Ozark Plateau Dairy and Poultry Area resemble the Ozark Meat Production Area with the farm enterprises leaning more heavily toward the meat animals and less upon dairying.

The great concentration of dairy cows, indeed, centers about the city of Springfield in Greene, Lawrence, Polk, Christian, and Webster counties. Unlike that of the Ozark border, however, the dairying of this area is not preponderantly a production of milk for the local market, but rather of such dairy products as butter, condensed milk, cream, and dried skim milk. These are marketed in the general consuming centers in the East.

Dairying finds a foothold in this area, nevertheless, for much the same reasons as cited for its presence in the Ozark Border Dairy

¹Located chiefly in St. Francois county.

and Wheat Area. That is, farms are small and the crop acreages per farm small as well. There is need, therefore, for an enterprise such as dairying that provides for an intensive use of the land and absorbs the labor that can be spared when crop acreages are small. However, the pasture season in this area is long. In some seasons cows may graze a part of practically every month. The excellent network of road and railroad facilities, particularly in the neighborhood of Springfield, has also favored the development of dairying. Finally, also there are a number of excellent creameries, condenseries, and milk drying plant scattered over the area. These have provided a good local market for dairy products and have had an effect on its development.

As far as numbers of poultry per farm or per one thousand acres of crop and pasture land are concerned, this area does not stand out particularly in relation to other areas. In fact, poultry numbers are greater in other areas. Nevertheless, the percentage of farm income secured from the poultry enterprise in this area is high. The area specialized in poultry and egg production for much the same reasons that it specializes in dairying. That is, poultry provides an outlet for much labor on farms that are small. The season is long and favorable to the enterprise and excellent markets for both fowl and eggs are located in the area. In fact, much of the marketing of eggs is carried on in conjunction with the marketing of dairy products. Commonly both are purchased at or sold to the same plant.

A small but not unimportant acreage of small fruits is produced in this area. The greater acreage is of strawberries though a much lesser acreage of grapes and cane fruits are to be found as well. These strawberries and grapes provide, in much the same manner as dairying and poultry provide, an outlet or use for labor that is not fully occupied in the production of other crops upon farms that are small in acreage. Important acreages of these strawberries are found in chiefly Webster, Laclede, and Greene counties in this area. They are important in Lawrence county but not in that section of Lawrence county included in the Ozark Plateau Dairy and Poultry Area.

The Southwest Fruit, Dairy, and Poultry Area.—In many respects the Southwest Fruit, Dairy and Poultry Area is merely a subdivision of the same type-of-farming area as the preceding Ozark Plateau Dairy and Poultry Area. There is, in reality, no greater difference in the farming of the Southwest Dairy, Fruit and Poultry Area and the Ozark Plateau Dairy and Poultry Area than there is

between the sub-areas of the Northern and Western Meat Production Area and probably less difference than there is between the sub-areas of the Ozark Meat Production Area. The real reason why this area is given the status of a major area is because it adjoins and is a part of an area in Northwestern Arkansas and the very easternmost sections of Oklahoma that are rather heavily specialized in fruit production.

Fruit has found a foothold in the Southwest Fruit, Dairy and Poultry Area for much the same reasons that dairying and poultry raising are found in the Ozark Plateau Dairy and Poultry Area. That is, small farms and small crop acreages together with a soil upon which fruits do more than usually well, have given fruit raising an advantage both from labor utilization and land utilization viewpoints.

A wide variety of fruits are produced. The major berry fruit is the strawberry. There are reasonably important acreages of grapes and much smaller acreages of cane fruits and, particularly in Stone and Christian counties, local acreages of tomatoes are produced for nearby canning factories. However, there is also a considerable acreage of tree fruits, particularly apples. The apples are found almost exclusively upon the Crawford soils which appear to be particularly well adapted to deeply rooted tree crops.

One should add, however, that unquestionably climate is a factor giving fruits an advantage in this area. The berries come on to the market in the so-called intermediate crop period. That is, in the case of strawberries, the Missouri berries come on the markets after the earliest berries from the extreme south but before the locally grown berries of the northern area are available. They find, therefore, a relatively favorable demand. For apples the great climatic advantage is the long growing season and the abundant sunshine which gives the fruit a fine finish and a high color.

Dairying and poultry production are only slightly less important as sources of incomes in the Southwest Fruit, Dairy and Poultry Area than they are in the Ozark Plateau Dairy and Poultry Area. One should remember also in this connection that general farms are more numerous in this area than any other type-of-farming so that meat production is still a relatively important enterprise.

The Southeast Lowlands Cash Crops Area.—Cotton is raised to a very small extent in most of the counties along the very southern edge of the state. There are small acreages of cotton in Taney, Ozark, Howell, Oregon, and Ripley counties. The important cotton acreages, however, are located on the alluvial lands of Southeast

Missouri in the area under consideration. The soils of almost all of this area have been formed by deposits of the Mississippi and tributary rivers. They are dominantly the Sharkey, Sarpy, Lintonia, and Waverly soils. In the northern part of the area there is a small amount of wind-laid soil. The only important areas of this latter type occur in Scott and Stoddard counties.

With the exception of the Waverly silt loam which has been badly leached the soils of the Southeast Lowlands are fertile. Most of them have, however, only recently been sufficiently well drained so as to be available for farming. Drainage had to be provided for all of the Sharkey, and much of the Sarpy, Lintonia, and Waverly soils that have been brought into production.

The growing season in the lowlands is longer and the rainfall is greater than in any other portion of the state. Furthermore, because of the smoothness of the topography erosion is practically unknown upon the alluvial soils though it is destructive enough upon the loessial deposits in Scott and Stoddard counties, locally known as Crowley's ridge and the Benton Hills.

Northern Corn, Cotton, and Wheat Sub-Area.—In the Northern Corn, Cotton, and Wheat sub-area the growing season is scarcely long enough so that cotton may be grown without considerable risk of frost damage. A certain acreage is, it is true, devoted to cotton. But the extent of the the cotton acreage is greatly less than in the southern part of the lowlands. In lieu of the cotton there are in these more northerly counties great acreages of corn and wheat. While much of the corn and virtually all of the wheat is sold upon the cash market, livestock enterprises are not entirely unimportant in some parts of this northern sub-area. For instance, virtually all of the higher parts of Crowley's and Sikeston ridges are in this northern area. Upon these ridges a considerable portion of the land is used for pasture and where this is true livestock and meat production come in as important farming enterprises.

In Mississippi county, on the other hand, where the soils are almost wholly alluvial the marketing of cash crops far transcends the livestock enterprises as a source of farm income.

In both the northern and southern sub-areas of the Southeast Lowlands Cash Crops Area there are to be found small acreages of vegetable and fruit crops. The raising of cantalopes and water melons is particularly important in Scott, Mississippi, and Dunklin counties. There are a few peach and apple orchards of some size and even a few growers that produce radishes and lettuce for the early market.

Southern Cotton and Corn Sub-Area.—Cotton is king in the southeastern counties in Missouri; New Madrid, Pemiscot, and Dunklin, for a number of reasons. In the first place, the soils of these counties are both fertile and very well adapted to cotton production. Rainfall is ample and rather well distributed and the season is long enough to mature the cotton but the winter weather cold enough to keep the boll weevil almost completely in check. In fact, these three Missouri counties lie in that very fortunate cotton area far enough south to mature cotton and far enough north to escape the gravest damage of the boll weevil.

About two-thirds of the farm area in Pemiscot county is devoted to cotton, one-half in Dunklin county and in the neighborhood of two-fifths in New Madrid county. The remaining acreage is given over to a variety of crops but chiefly to corn. Pasture acreage is almost negligible in this area. Not more than 5 per cent of the acreage in farms is pasture land. Livestock (other than work stock enterprises) are, therefore, unimportant as a source of income. Such livestock as there are, are chiefly dairy cows and hogs. Dairying is locally important around such population centers as Caruthersville and Kennett, the largest cities of the area. Only in one respect is there an exception to this statement with respect to livestock. The numbers of horses and mules is higher in this area per thousand acres of land in farms than in any other in the state. Cotton production requires a large amount of animal power. A considerable portion of the corn grown in this area is produced for the specific purpose of feeding the work stock.

In one other respect the agriculture of this area is different from that of any other of the areas of the state in that the system of tenure reflects the usual situation in cotton growing areas. Land is customarily not owned by the people that operate it. The percentages of tenancy in the three major cotton counties in 1935 were respectively, Pemiscot 80.0 per cent, Dunklin 69.1 per cent, New Madrid 89.7 per cent. The number of ownerships and the number of operating units in the bulk of the state tend to be very similar. In the southern cotton and corn sub-area the numbers of ownerships tend to be much fewer than the number of operating tracts and the usual situation is one in which one owner is associated with a large number of tenants or croppers. In other words, in this area the plantation system of ownership and operation of the southern cotton belt region is more characteristic than the single ownership and operating unit of the more northern states.