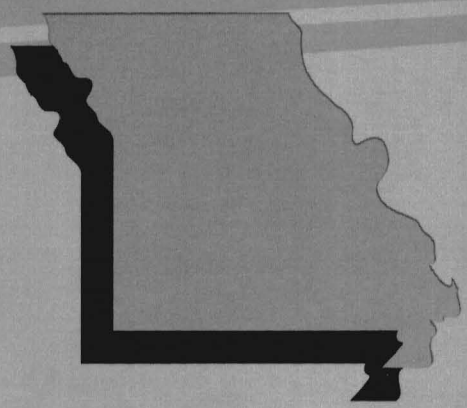
The Social and Economic Organization of Missouri Agriculture, 1964–1992



Perspectives on Agriculture, Food and Natural Resources

Missouri Agricultural Experiment Station Special Report 486

Perspectives on Agriculture, Food and Natural Resources

This special report is one of a series (listed below) prepared for a project of the Missouri Agricultural Experiment Station (AES).

The project, called "Perspectives on Agriculture, Food and Natural Resources," was designed to identify and describe trends in Missouri Agriculture and Rural Missouri and to assess the implications of changes that are occurring. A purpose was to assist the AES in establishing priorities and planning programs.

These reports provide background information on the future economic, social, political and technical environment for agriculture. A second series of reports, now being developed, examines the challenges and opportunities facing selected industries and identifies some of the research needed to help Missouri agriculture achieve its potential.

LIST OF PUBLICATIONS:

SR486	The Social and Economic Organization of Missouri Agriculture, 1964–1992
SR487	The State of Rural Missouri
SR488	The Status and Potential of Missouri Agriculture
SR489	Selected Characteristics of the Missouri Horticulture Industry
SR490	The Status of Selected Natural Resources in Missouri
SR491	Missouri's Food Processing Industry
SR492	10-Year Agricultural Outlook
SR493	Comparative Funding of the Missouri Agricultural Experiment Station

The Social and Economic Organization of Missouri Agriculture, 1964–1992

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Missouri Agricultural Experiment Station Special Report 486

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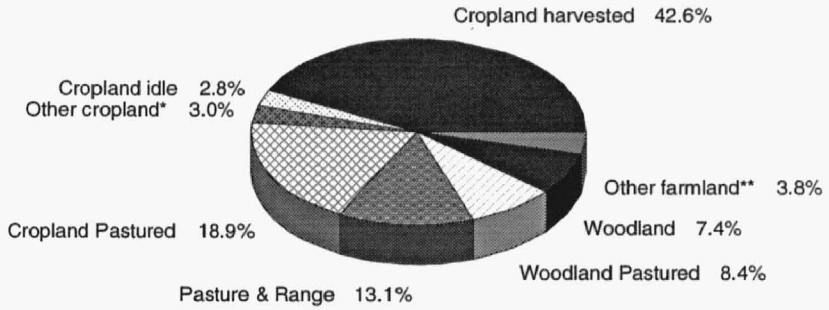
Missouri Counties

Introduction: Missouri's Agricultural Diversity

Missouri is notable for both the diversity of its agricultural resource base and the wide array of agricultural products it produces. Farmers operating within the varied topography and climate of the state have produced regional farming patterns ranging from the crop farms of the Bootheel to the cow-calf operations which dot Missouri's Ozark hills.

Farms encompass approximately 28.5 million acres, or 65 percent of Missouri's total land area. In 46 of Missouri's 114 counties, more than 75 percent of the total land base is contained in farms. Crop production provided the largest single use of this land in 1992. Grains, oilseeds, hay and other crops were harvested on 42.6 percent of Missouri's total farmland. Missouri farmers used another 40.4 percent of farmland for pasture. Farmers in the United States as a whole, as compared to Missouri farmers, used a smaller proportion of farmland for growing crops (31.3 percent) and a larger propor-

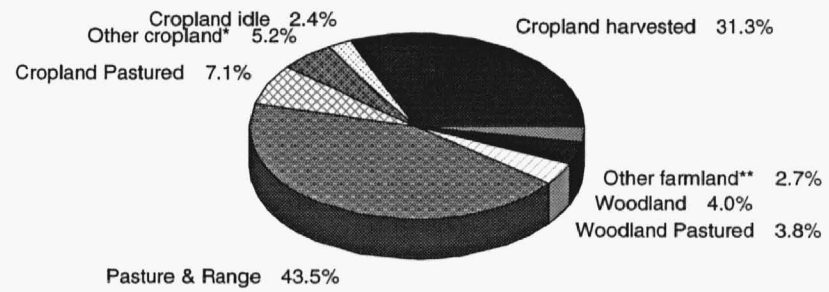
Missouri Agricultural Land Use, 1992



Total Land in Farms = 28,546,875 acres

*Other cropland = cover crops, land where all crops failed, and summer fallow
**Other farmland includes land in house lots, ponds, roads and wasteland
Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

United States Agricultural Land Use, 1992



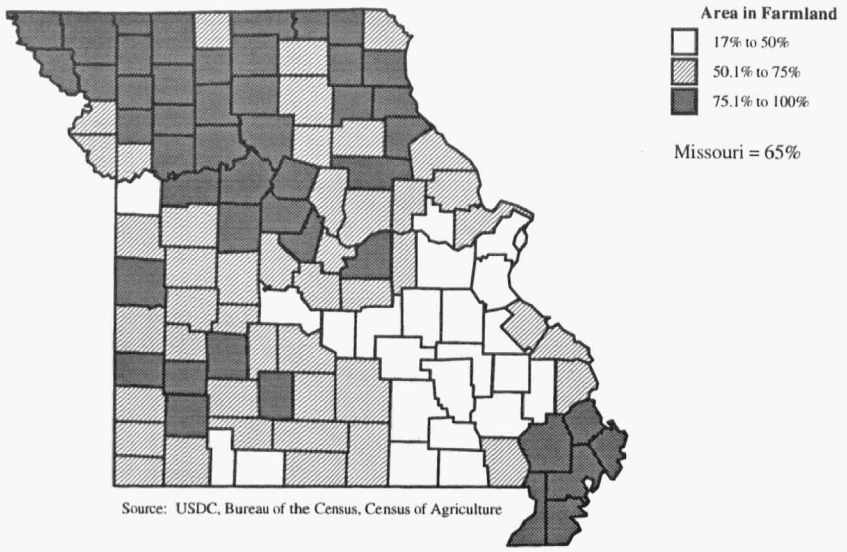
Total Land in Farms = 945,531,506 acres

*Other cropland = cover crops, land where all crops failed, and summer fallow
**Other farmland includes land in house lots, ponds, roads and wasteland
Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

tion as pasture (54.4 percent).

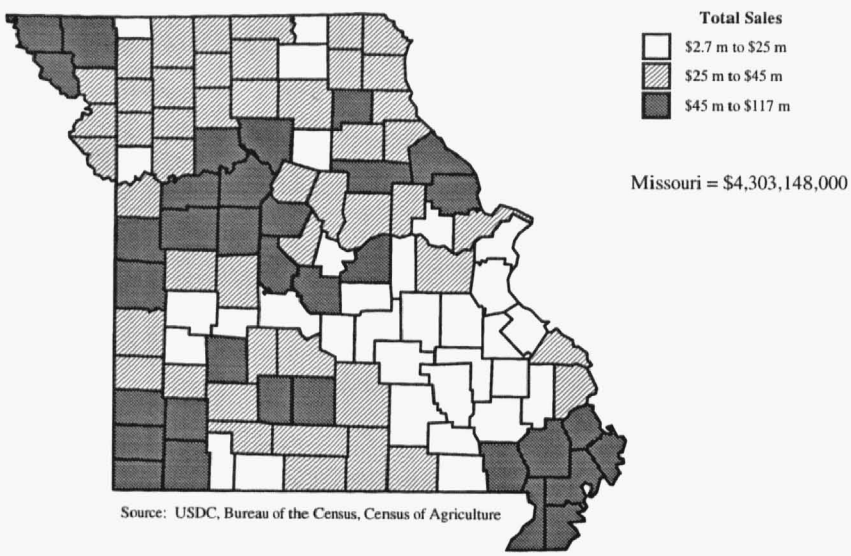
Missouri farmers sold agricultural products worth $4.3 billion in 1992. In 34 Missouri counties, agricultural sales exceeded $45 million. Livestock sales accounted for 56.7 percent of agricultural receipts and crop sales accounted for 43.3 percent. This distribution between livestock and crop receipts has remained relatively stable since the mid-1970s. Missouri's distribution also approximates that of the United States, for which 53.7 percent of 1992 receipts were from livestock and 46.3 percent were from crops. Sales of cattle and calves were the largest single component of agricultural sales in Missouri, accounting for 27.2 percent of total receipts in 1992. The four major field crops in the state, corn, soybeans, wheat and sorghum, together constituted 35 percent of 1992 sales. Hog and pig sales accounted for 11.5 percent of 1992 sales, poultry sales for another 9.5 percent and dairy products for 7.8 percent.

Missouri: Percent of Total Land Area in Farms, by County
1992



Source: USDC, Bureau of the Census, Census of Agriculture

Missouri: Market Value of Agricultural Products Sold
1992

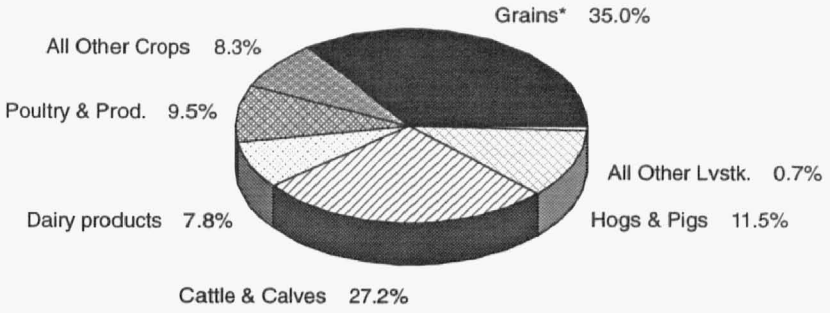


Source: USDC, Bureau of the Census, Census of Agriculture

Missouri has experienced a decrease in farm numbers and total farmland area, and an increase in average farm size over the past 30 years. However, the rates of change in each category have been less than for the United States overall. Between 1964 and 1992, Missouri farmland area declined by 13 percent, farm numbers declined by 33 percent and average farm size increased 31 percent. Meanwhile, total farmland in the United States decreased by 15 percent, farm numbers fell by 39 percent and average farm size increased 39 percent. At 291 acres, the average farm in Missouri is 200 acres smaller than the average U.S. farm.

Individuals or families still control the vast majority of Missouri's farms. Eighty-eight percent of Missouri farms are organized as sole proprietorships. These farms hold 80 percent of Missouri's farmland and sell 70 percent of the state's agricultural products. In recent years, some Missouri farms have sought

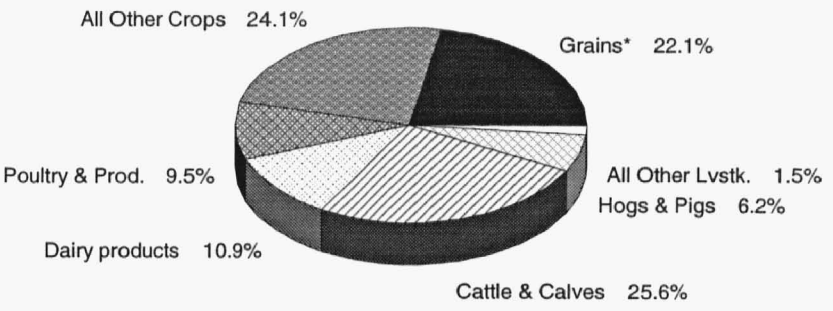
Distribution of Missouri's Agricultural Receipts, 1992



Total Agricultural Sales = $4.3 billion

*Grains include corn, soybeans, wheat and sorghum
Livestock = 56.7% of receipts; Crops = 43.3%
Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

Distribution of the United States' Agricultural Receipts, 1992



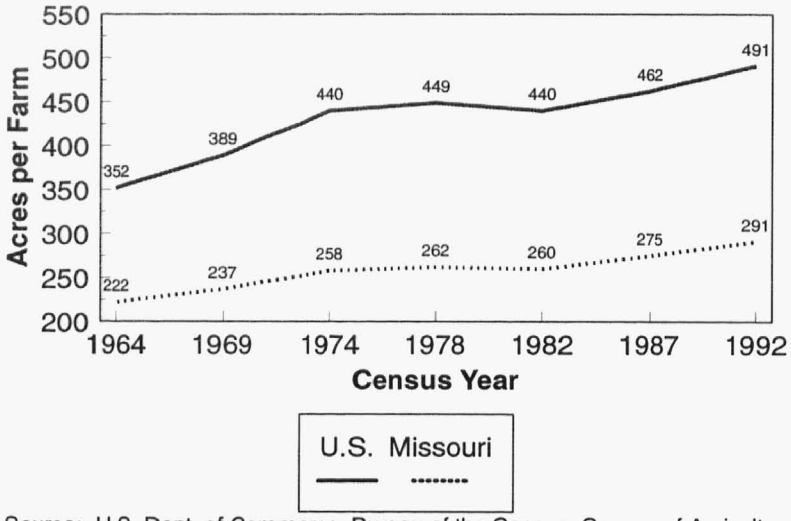
Total Agricultural Sales = $162.6 billion

*Grains include corn, soybeans, wheat, sorghum, barley and oats
Livestock = 53.7% of receipts; Crops = 46.3%
Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

alternative forms of organization, and these farms control a proportionally larger share of agricultural production than their numbers would indicate. Partnerships make up 9 percent of Missouri farms, farm 13 percent of farmland and sell 16 percent of agricultural products. Family corporations represent 2 percent of all farms in the state, farm 6 percent of farmland and sell 12 percent of agricultural output. Non-family corporations and other types of farms represent less than 1 percent of Missouri farms. Females operate 7 percent of Missouri farms. However, female operators are most prevalent on Missouri's smallest farms. Sixty-seven percent of Missouri's female farmers operate a farm with less than $10,000 in annual sales. Less than 1 percent of Missouri farmers are members of minority groups, most of them African Americans.

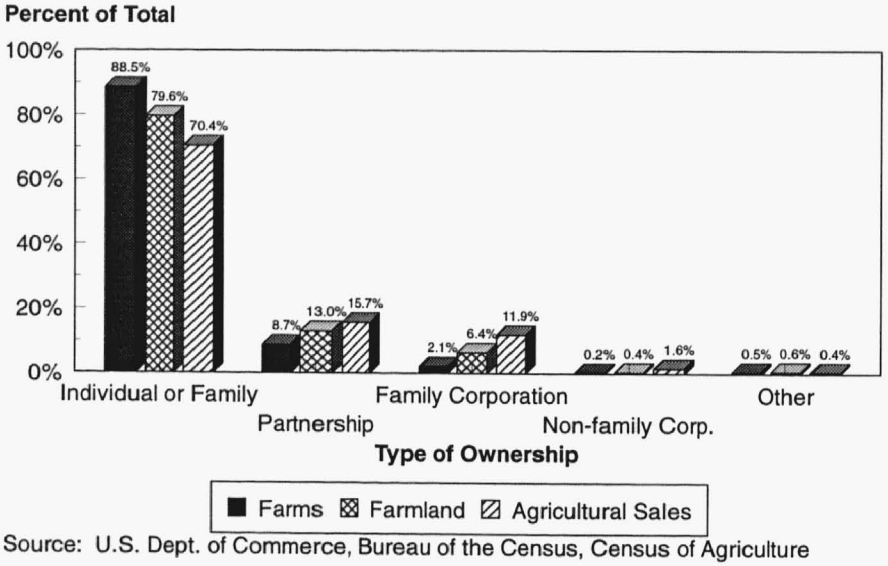
Even though production agriculture provides fewer jobs than in the past, the food system as a whole makes a

Average Farm Size for Missouri and the United States



Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

Missouri: Distribution of Farms, Farmland and Sales by Type of Ownership Organization, 1992

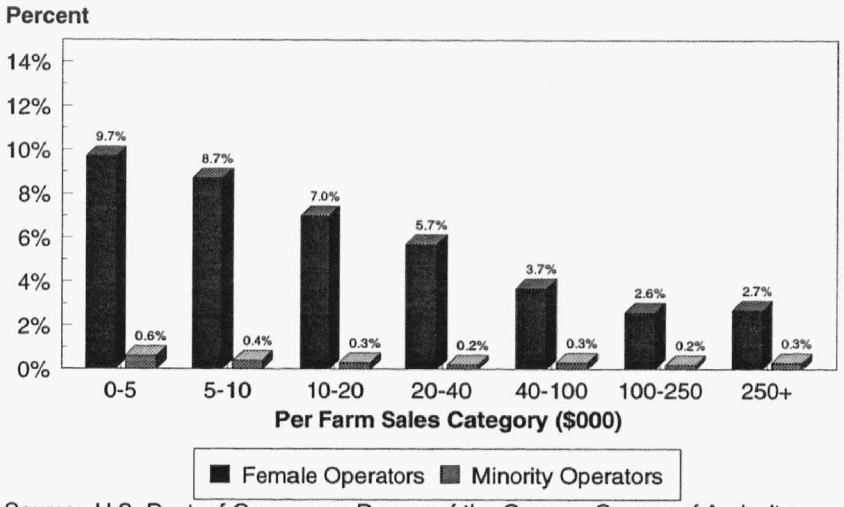


Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

substantial contribution to Missouri's economy. In 1990, agricultural production and food processing together provided 8 percent of jobs and produced 12 percent of total industrial sales in Missouri.

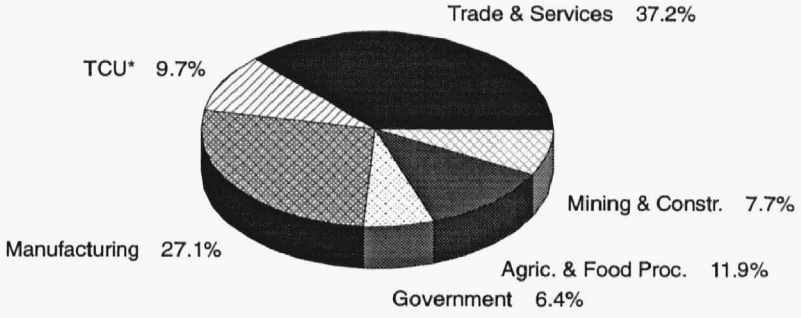
In the balance of this book, we will attempt to better understand Missouri's agricultural diversity. We will also examine the consequences of changes in technology, market structure and demographics for Missouri agriculture. The social and economic reorganization precipitated by these changes has important implications for the future of Missouri farmers, consumers, rural communities and associated agribusinesses.

Percent of Missouri Farms with Female or Minority Operators, by Sales Category, 1992



Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture
Missouri: Female Operators 7.3%; Minority Operators 0.4%

Missouri's Economic Output, by Sector, 1990



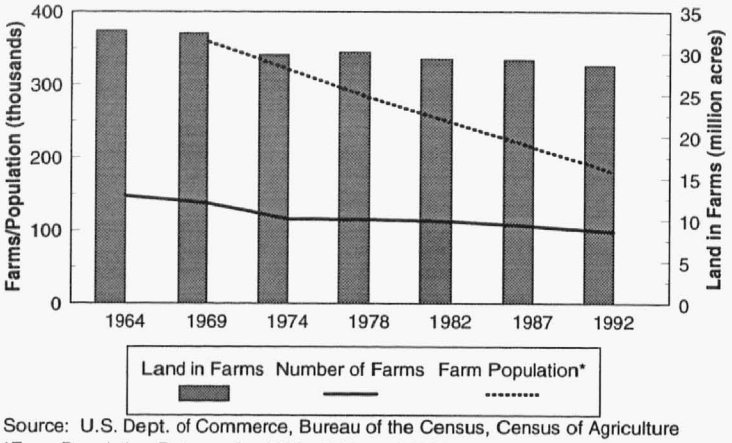
Total Sales by Missouri Industries = $196.6 billion

*TCU = Transportation, Communications and Utilities
Source: Curtis Braschler and Gary Devino, "Structural Overview of the Missouri Economy in 1990". UMC, Agricultural Economics Dept.

Changes in Farm Numbers, Farm Population and Land in Farms

Total farmland area, number of farms and farm population all declined in Missouri between 1964 and 1992. However, the amount and significance of the decline in each of these three categories varies greatly. Total land in farms in Missouri declined by 13 percent, from 32.7 million acres in 1964 to 28.5 million acres in 1992. Urbanization has claimed some productive farmland, particularly near the Kansas City and St. Louis metropolitan areas. However, for the state as a whole, increased productivity on remaining farmland has led to an increase in total agricultural output over this time period.

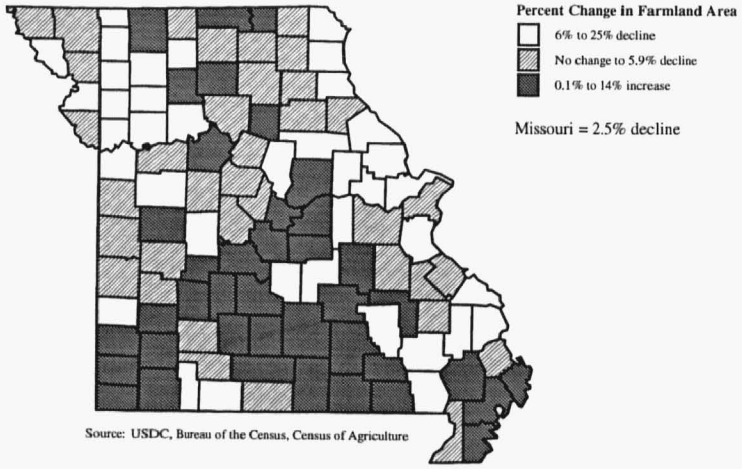
Missouri: Number of Farms, Farm Population and Land in Farms



Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture
*Farm Population Data are for 1970, 1980, and 1990

The total number of farms in the state has declined much more rapidly than the amount of land in farms, leading to an increase in average farm size. Farm numbers in Missouri declined by 33 percent, from 147,315 in 1964 to 98,082 in 1992. Farm numbers fell fastest in some of Missouri's most productive agricultural counties, especially those counties with significant amounts of cropland. Between 1982 and 1992, 10 of Missouri's top 11 crop-producing counties lost 17 percent or more of their farms. The decline in farm numbers has been slowest in central, south-central and southwest Missouri. In these counties, retirement and off-farm employment opportunities have sustained many part-time farms, thereby inflating total farm numbers.

Missouri: Percent Change in Farmland Acreage 1982 to 1992

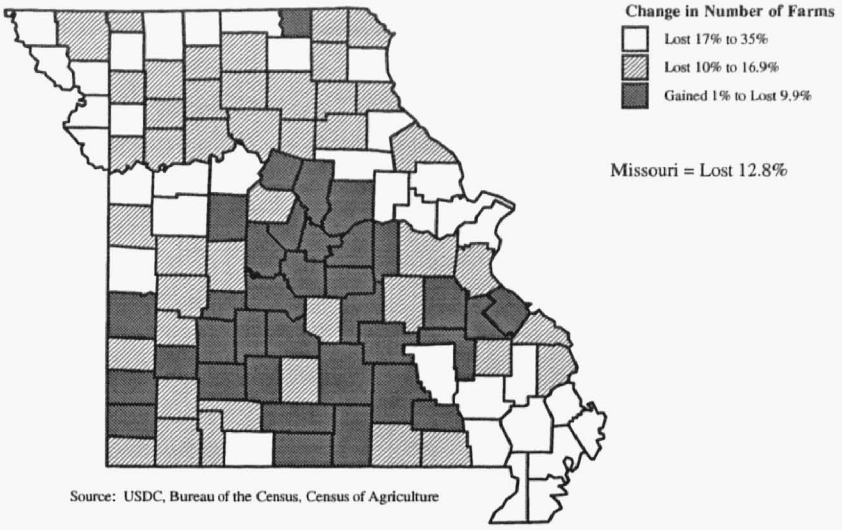


Source: USDC, Bureau of the Census, Census of Agriculture

The decline in farm population in Missouri has outpaced the decrease in farm numbers. Farm population in Missouri declined by

50 percent between 1970 and 1990, from 359,300 to 180,100. There are several possible explanations for this trend. Changes in technology have reduced the number of people required for agricultural production. This, coupled with other factors, has allowed farm family size to grow closer to the U.S. average family size, partially contributing to the decline. These technological innovations also enable some farmers to live in town and maintain their farm in the countryside, further contributing to the population decline. The average age of farmers in the state has also increased over this time period, increasing the percentage of farmsteads occupied by one- or two-person households, instead of younger families with children.

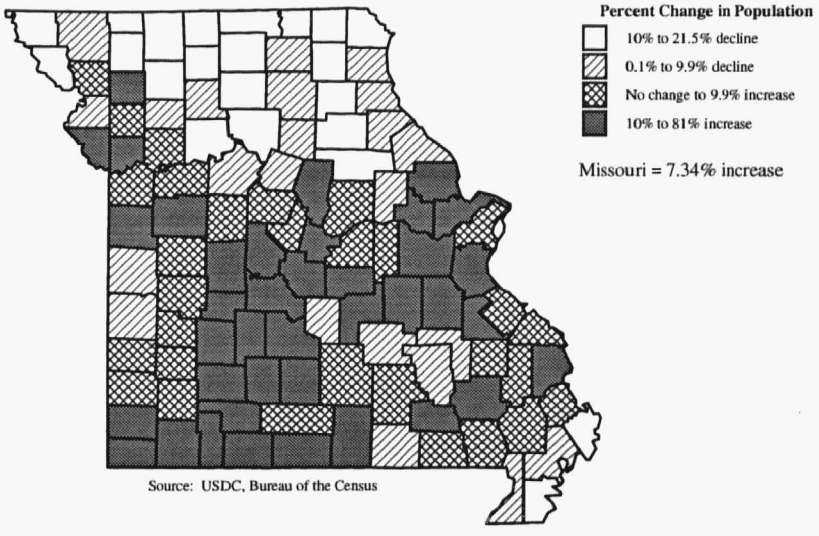
Missouri: Percent Change in Number of Farms
1982 to 1992



Source: USDC, Bureau of the Census, Census of Agriculture

In some parts of Missouri, the loss of farms has made it difficult to sustain related economic activity. Thus, a decline in farm numbers has led to a decline in associated farm service and supply businesses, a decline in total population and a drying up of rural communities. This has been particularly apparent in rural, north Missouri. Thirty-two of the 35 non-metropolitan counties north of the Missouri River experienced a decline in total population between 1980 and 1994; in 19 of the 35 counties the decline was 10 percent or greater.

Missouri: Percent Change in Population
1980 to 1994

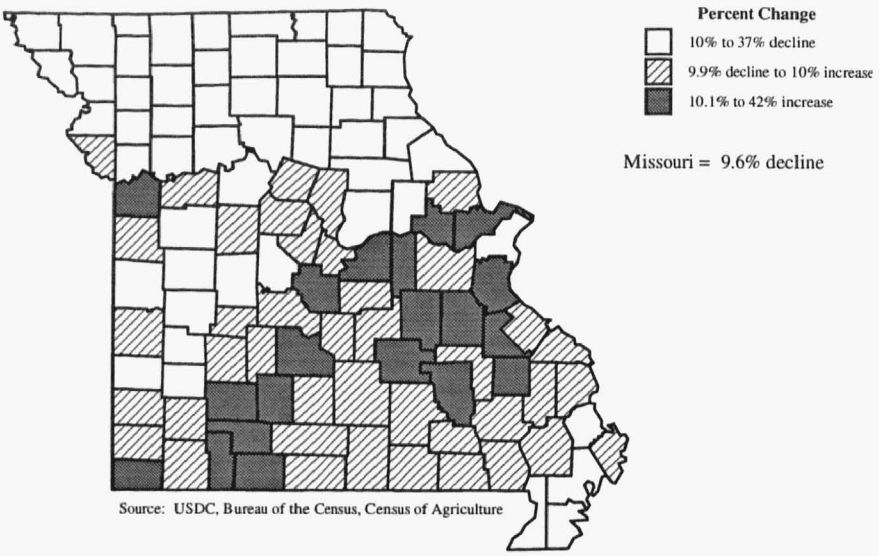


Source: USDC, Bureau of the Census

Change in the Value of Farm Assets

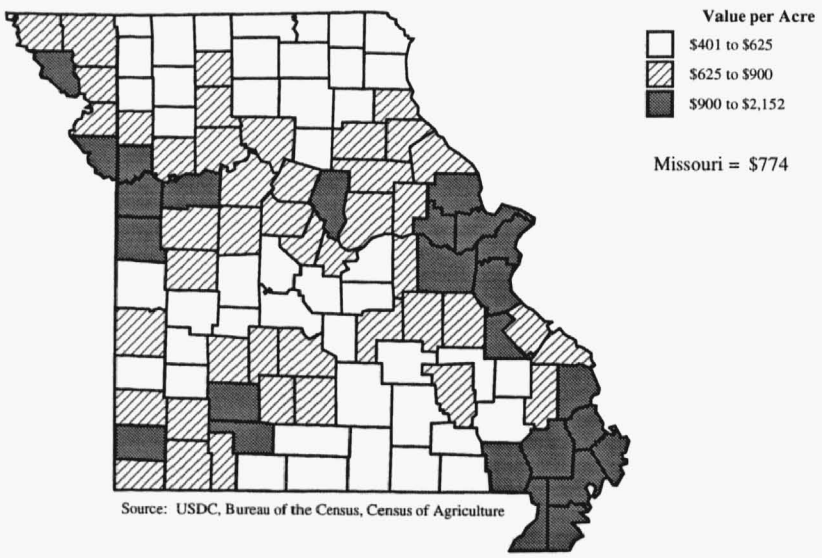
Farmland values in Missouri and the United States peaked in the early 1980s and declined sharply before stabilizing in the late 1980s and early 1990s. The average per-acre value of farmland and buildings in Missouri declined by 9.6 percent between 1982 and 1992. Values declined by 10 percent or more in 53 Missouri counties, including every non-metropolitan county north of the Missouri River and five Bootheel counties. Those counties where farmland values increased are mainly in areas that experienced population growth, which increased the residential demand for farmland. The 21 Missouri counties where the average value of farmland and buildings is $1,000 per acre or more are all either metropolitan counties, or located in the Bootheel region, except for St. Francois and Cape Girardeau counties.

Missouri: Percent Change in Per-Acre Value of Farmland and Buildings 1982 to 1992



Source: USDC, Bureau of the Census, Census of Agriculture

Missouri: Average Value of Farmland and Buildings per Acre 1992



Source: USDC, Bureau of the Census, Census of Agriculture

Change in Leased Farmland Acreage

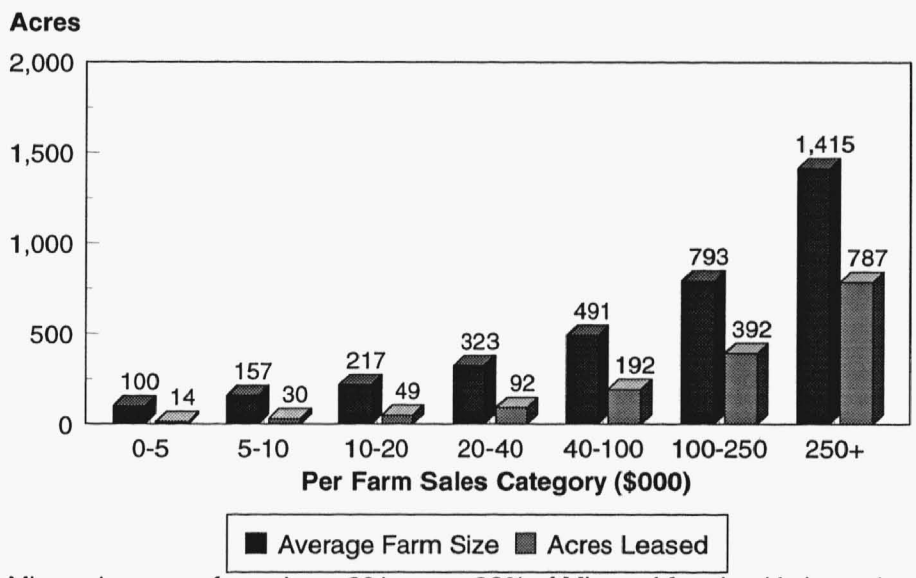
More than one-third of Missouri's agricultural production takes place on leased farmland. In fact, the operators of Missouri's largest, most productive farms lease the majority of the land they farm. On Missouri farms with $250,000 or more in sales, which collectively produced 42 percent of the state's agricultural sales, 56 percent of land farmed in 1992 was leased. At the other extreme, operators of farms with less than $5,000 in sales owned 86 percent of the land they farmed.

The high percentage of farmland leased by large farms reflects the capital intensive nature of modern agriculture, historic land tenure patterns in rural areas and an unwillingness by farmers to tie up equity in land ownership. Missouri farms with $250,000 or more in sales average 1,415 acres in size. The capital required to purchase this amount of land makes leasing a more attractive expansion strategy. Furthermore, there are often retired or part-time farmers in the area who wish to retain ownership of their land, but do not want to farm it themselves.

In 1992, 36 percent of Missouri farmland was leased, most of it for crop production. Leasing is most prevalent in the major crop-producing areas of the state. Nineteen Missouri counties, all of them major crop producers, had 45 percent or more of their farmland leased in 1992. In the seven counties of Missouri's Bootheel, 70 percent of farmland was leased in 1992.

Total leased farmland acreage in Missouri increased by 758,785 acres between 1982 and 1992.

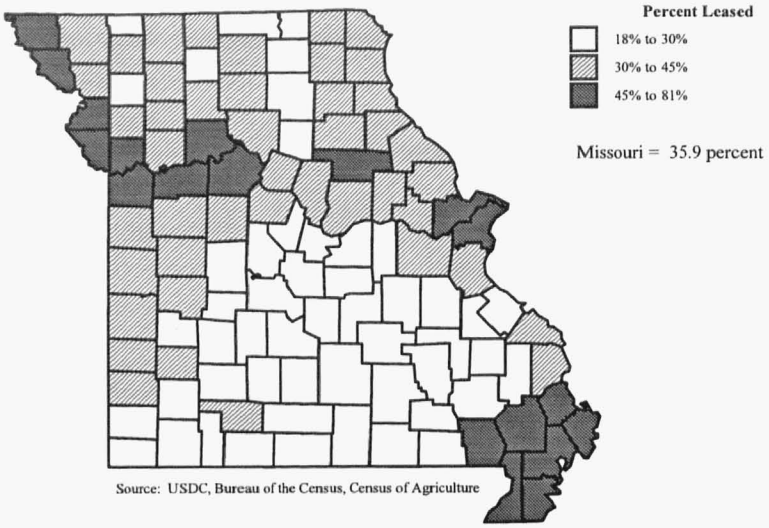
Missouri: Average Farm Size and Average Acres Leased, by Sales Category, 1992



Missouri average farm size = 291 acres; 36% of Missouri farmland is leased
Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

However, the greatest percentage increases in leased acreage occurred in counties that have traditionally not had large amounts of acreage leased. In 19 southwest and south-central Missouri counties with little cropland, farmland leased increased by 15,000 acres or more between 1982 and 1992. Most of these counties experienced significant population growth over this same time period, much of it retirement related. It is possible that many of these newcomers are buying substantial amounts of farm acreage, then leasing it to other producers for haying, grazing, or other uses.

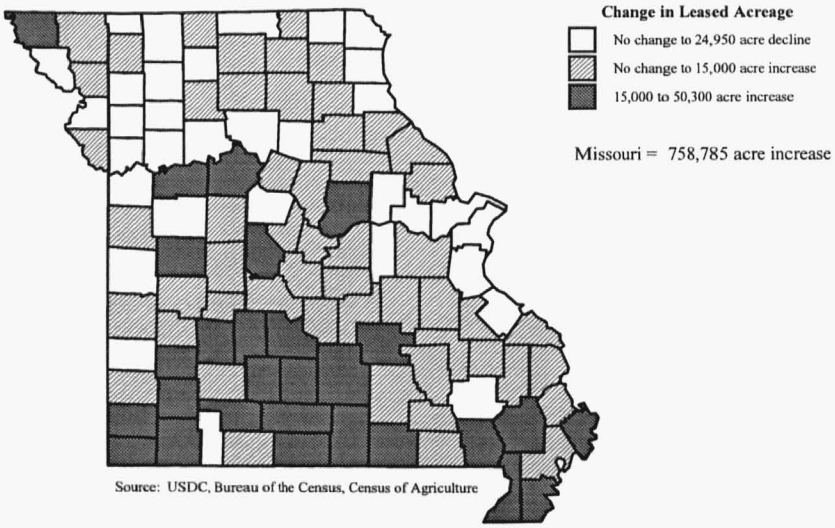
Missouri: Percent of Farmland Leased
1992



Source: USDC, Bureau of the Census, Census of Agriculture

According to the 1988 Agricultural Economics and Land Ownership Survey, 71.4 percent of Missouri farmland was operator-owned in 1988. Farm operators owned another 4.2 percent of farmland, but leased it to other farmers. Non-farm-operators owned the remaining 24.4 percent of farmland and leased it to farmers. Demographic data from this same survey indicate that 58.2 percent of non-farm-operator landlords were 65 years of age or older, and owned 58 percent of non-operator-held leased farmland. Based on data from the 1992 Census of Agriculture, we estimate that 64 percent of Missouri's farmland was operator-owned in 1992. Farm operators owned another 6 percent of farmland, but leased it to another farmer. Non-farm-operators owned the remaining 30 percent of farmland and leased it to farmers.

Missouri: Change in Leased Farmland Acreage
1982 to 1992

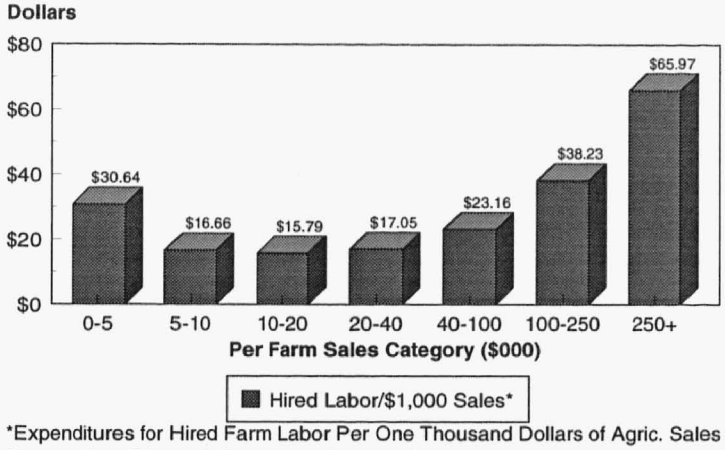


Source: USDC, Bureau of the Census, Census of Agriculture

Use of Hired Labor in the Production Process

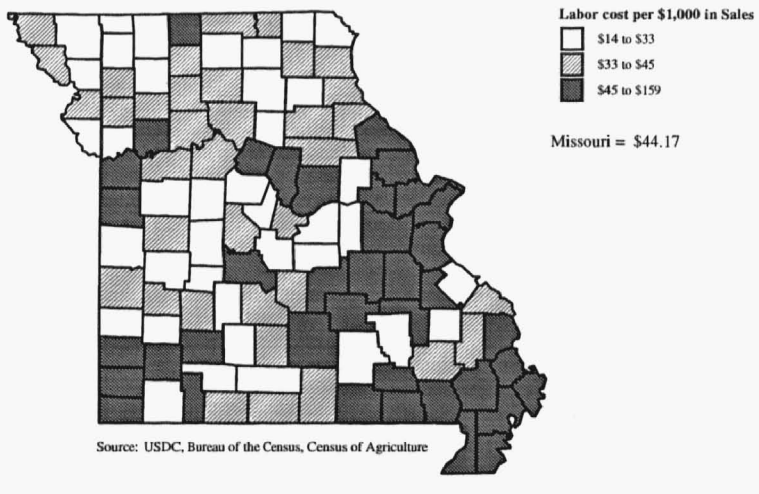
Agricultural production in Missouri is increasingly carried out with hired, rather than family labor. This is particularly true of the largest, most productive farms in the state. By using a ratio of dollars spent on hired labor to total dollars of agricultural sales, it is possible to compare the extent to which farms of different sizes rely on hired labor in the production process. Missouri farms, on average, spend $44.17 on hired labor for every $1,000 of agricultural products sold. However, those farms with annual sales of $250,000 or more, which collectively produce 42 percent of Missouri's agricultural output, spend $65.97 on hired labor (almost one and one-half times as much) per $1,000 of sales. Expenditures for hired labor also vary markedly throughout the state. The ratio of hired labor expense per $1,000 of sales is highest in the major crop- producing counties of the state, where farms depend on large amounts of seasonal labor for planting and harvesting of crops. The ratio is also relatively high in some counties near metropolitan areas. This may be due to the large number of part-time farms in these counties, whose operators hire workers to carry out those tasks they cannot do because of their off-farm jobs.

Expenditures for Hired Labor by Sales Category, 1992



*Expenditures for Hired Farm Labor Per One Thousand Dollars of Agric. Sales
Average for all farms is $44.17 per $1,000 of Agricultural Sales
Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

Missouri: Hired Labor Expense per $1,000 of Agricultural Sales 1992



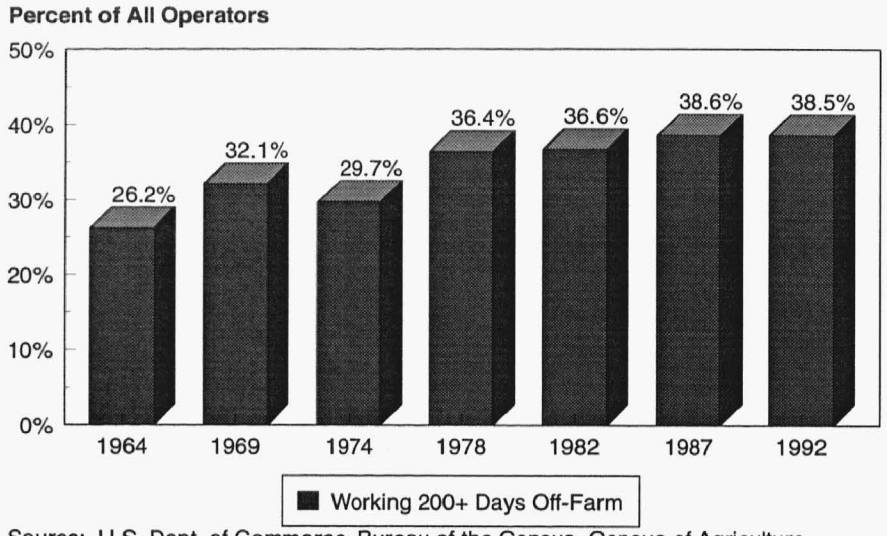
Source: USDC, Bureau of the Census, Census of Agriculture

Increased Importance of Off-farm Work to the Farm Household

Off-farm work has become increasingly important as a supplement to farm income in Missouri over the past 30 years. In 1964, 26.2 percent of principal farm operators in Missouri worked somewhere other than their farms for at least 200 days of the year (roughly equivalent to being employed full-time off the farm); by 1992, 38.5 percent of farm operators were working 200 or more days per year off the farm. The proportion of farmers working 200 or more days off-farm varies widely throughout the state. In general, this proportion is lowest in crop-producing counties and those counties not within easy commuting distance of an urban area.

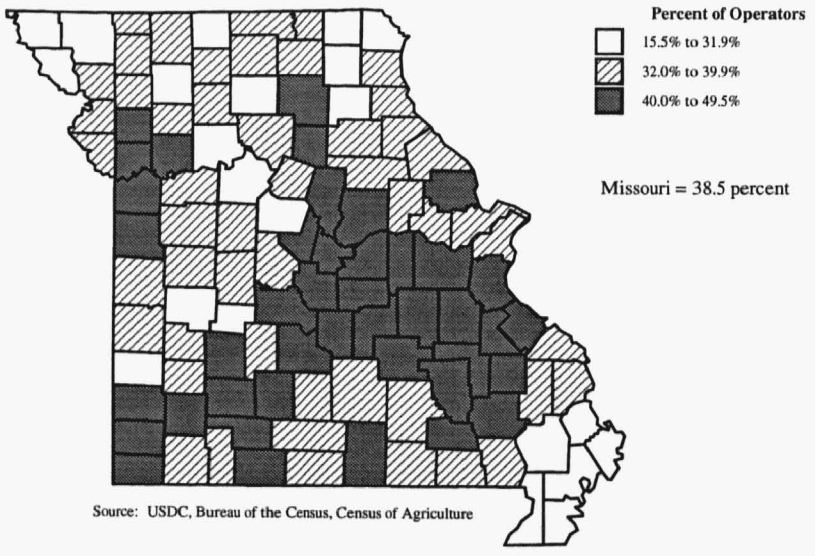
The proportion of operators working 200 days or more off-farm is highest among small farms. Operators of the smallest 52 percent of Missouri farms--

Missouri: Percent of Farm Operators Working 200 or More Days Off-Farm Per Year



Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

Missouri: Percent of Operators Working 200 or More Days Off Farm 1992

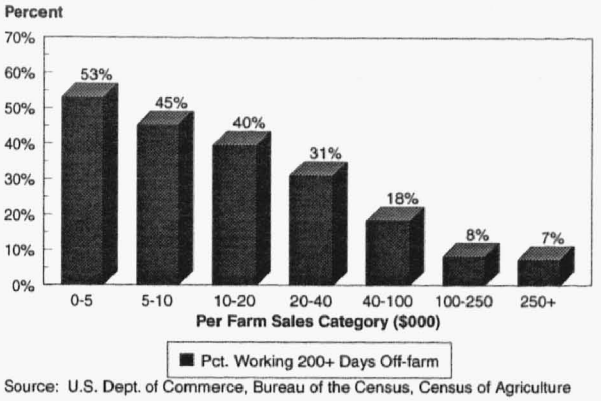


Source: USDC, Bureau of the Census, Census of Agriculture

those with annual sales less than $10,000--on average, operated their farms at a net loss in 1992. These farmers effectively subsidized their farm operations with retirement related income or income from an off-farm job. Fifty-three percent of operators of farms with $5,000 or less in annual sales worked 200 or more days off-farm in 1992; 45 percent of those farm operators with $5,000 to $9,999 in sales worked 200 or more days off of their farms. By using nonfarm income sources to supplement their farm income, these farmers provide important economic benefits to their local communities, in the form of feed, equipment and other supplies purchased for their farm operations. Those Missouri farms with $100,000 to $249,999 in sales earned an average $42,667 net return from agricultural sales in 1992, and 8 percent of these operators worked 200 or more days off the farm. The 3,396 Missouri farms with $250,000 or more in 1992 sales averaged $123,911 in net return from agricultural sales per farm; 7 percent of these operators worked 200 or more days off the farm.

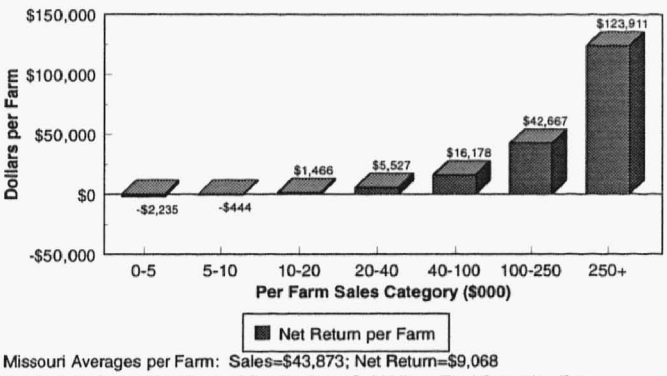
Off-farm income is often an important part of household income even on the largest farms, in the form of a spouse employed off the farm. The average farm household in the Midwest (a 12-state region that includes Missouri) reported total income of $34,363 in 1992; 81 percent of this household income was from nonfarm sources. The large proportion of small farms in Missouri relative to surrounding states means that off-farm income is probably even more important in Missouri than in the Midwest as a whole.

Missouri: Percent of Operators Working 200 or More Days Off-farm, by Sales Category, 1992



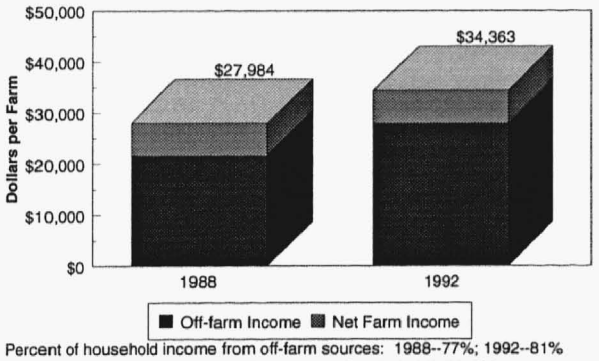
Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

Net Cash Return from Agricultural Sales per Farm, by Sales Category, 1992



Missouri Averages per Farm: Sales=$43,873; Net Return=$9,068
Net Return=Gross Mkt. Value of Ag. Products Sold Minus Total Operating Expenses
Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

Income, by Source, for the Average Farm Household in the Midwest Region



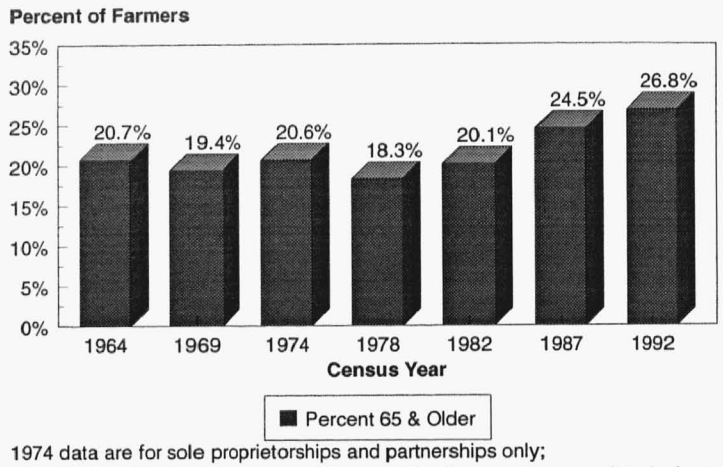
Percent of household income from off-farm sources: 1988--77%; 1992--81%
Midwest Region = ND, SD, NE, KS, MN, IA, MO, WI, IL, MI, IN, OH
Source: ERS, Farm Cost Returns Survey

The Aging of Missouri's Farmers

Older farmers operate an increasing proportion of Missouri's farms. In 1964, 20.7 percent of Missouri farm operators were 65 years of age or older; by 1992, 26.8 percent of Missouri farmers fell into this age category. By contrast, 14.0 percent of Missouri's total population was 65 or older in 1990.

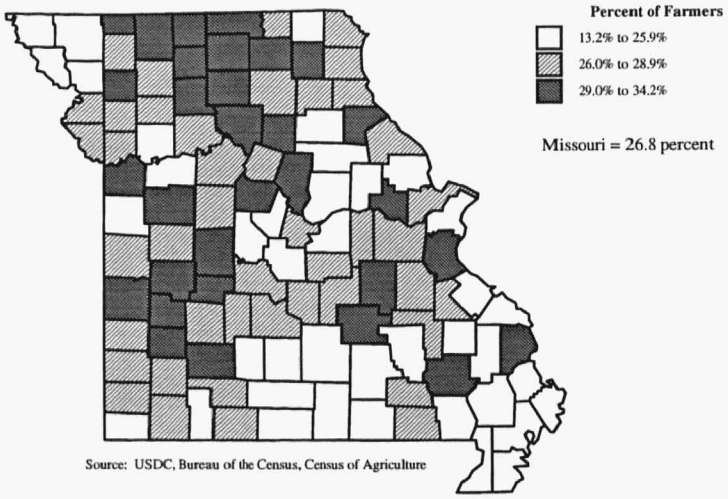
The large proportion of farmers currently 65 or older is partly a generational phenomenon. After World War II, a large age cohort of former G.I.s returned to the United States and began farming. If these individuals were 20 to 30 years of age in 1945, they would be 70 to 80 years of age in 1995. A combination of factors has led these farmers to continue farming beyond retirement age. Global production shortfalls in the 1970s led to increased world demand for U.S. agricultural commodities, higher commodity prices, an expansion of production and an increase in land values. This was followed by a leveling off of world demand, a buildup of grain stocks, rapid deflation of land values and economic stagnation in the farm sector in the 1980s. Census figures show a relatively steady exit of farmers 65 and older from 1964 to 1978. They also

Missouri: Percent of Farmers Age 65 or Older



1974 data are for sole proprietorships and partnerships only;
Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

Missouri: Percent of Farmers 65 Years or Older
1992



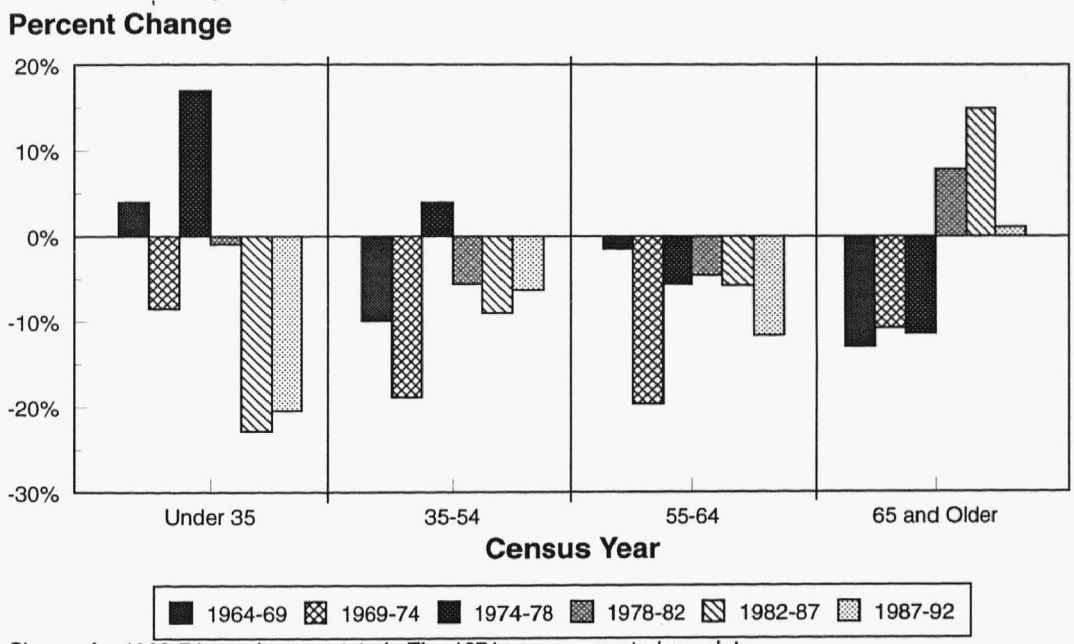
Source: USDC, Bureau of the Census, Census of Agriculture

reveal net entry of farmers under 55 years of age between 1974 and 1978. However, the only age group of farmers to increase in absolute numbers since 1978 is the 65 and older category. It is likely that those farmers of retirement age, who may have been ready to leave farming after 1978, found few young people wanting to enter farming during an economic downturn or realized that they would have to sell their farmland at values well below the peak of a few years earlier. Land turnover and leasing of farmland are both likely to increase over the next few years in those areas with high concentrations of older farmers, such as parts of northern Missouri. This land turnover is more likely to lead to further consolidation of land in existing farm operations than to increased entry of beginning farmers.

Retirement patterns in the United States over the last several years have also contributed to the large proportion of farmers in Missouri who are 65 and older. Many retirees have forgone retirement destinations on either coast in favor of locations in the Midwest, including the Missouri Ozarks. Many of these retirees have purchased a few acres and stocked them with cattle. These small operations are counted in the farm census and raise the proportion of farmers age 65 and older.

Farmers age 65 and older make significant contributions to Missouri agriculture. This age

Missouri: Percent Change in Number of Farmers by Age for Selected Census Intervals

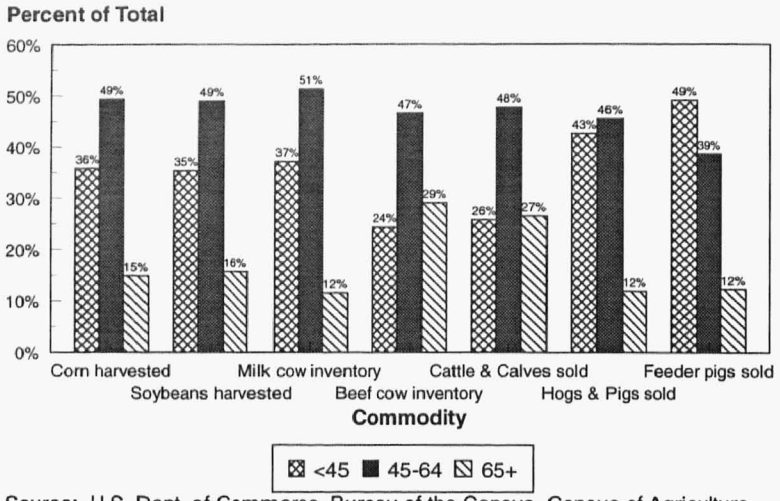


Change for 1969-74 may be overstated. The 1974 census reported age data for only sole proprietorships and partnerships. 884 farms were excluded.
Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

group, which constitutes just under 27 percent of all farmers, holds 29 percent of Missouri's beef cow inventory, and accounts for 27 percent of all cattle and calves sold. Missouri would not be such a major feeder-calf producer without these farmers. On the other hand, farmers 65 and older play a much smaller role in the more time-consuming and labor-intensive activities of crop production, dairy production and hog production.

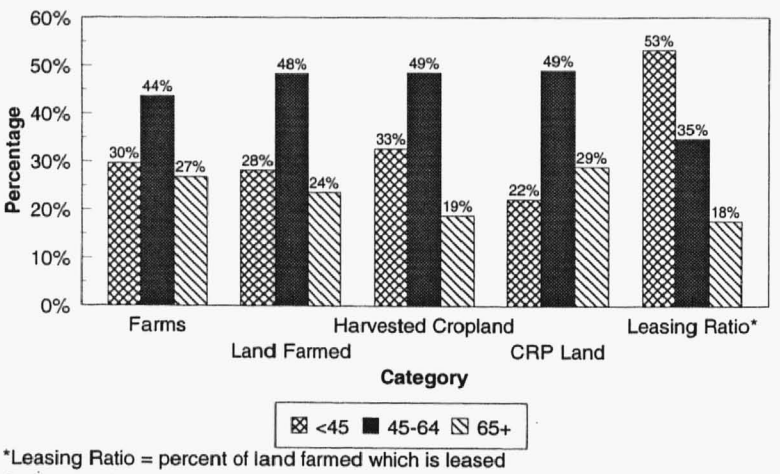
Farmers 65 and older farmed 24 percent of Missouri's farmland in 1992. Much of the land they farm is hay ground, pasture, woodland or idled cropland. Farmers 65 and older farmed only 19 percent of Missouri's cropland, but controlled 29 percent of Missouri farmland in the Conservation Reserve Program (CRP) in 1992. Farmers 65 and older tend to own rather than rent the land they farm. They owned 82 percent of the land they farmed in 1992, versus the average of 64 percent for all Missouri farmers.

Missouri: Production of Selected Commodities by Age Group, 1992



Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

Distribution of Missouri Farms, Farmland and Ownership by Age Group: 1992



*Leasing Ratio = percent of land farmed which is leased

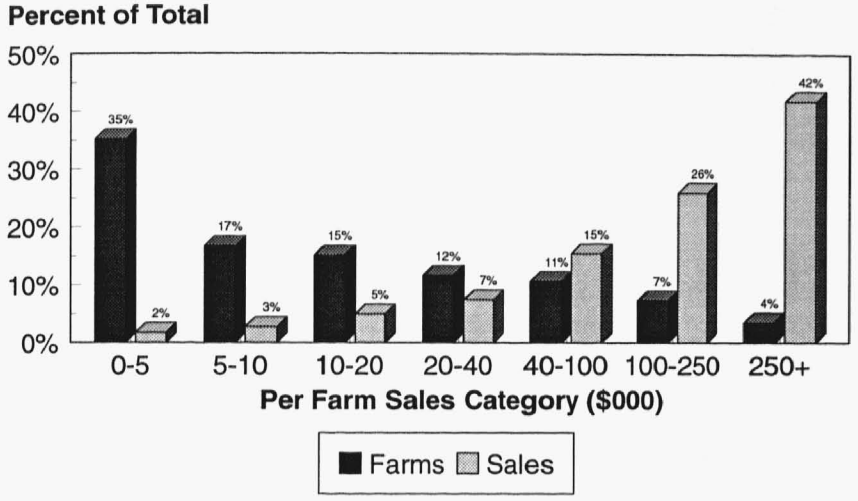
Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

Increasing Concentration of Production Among Largest Farms

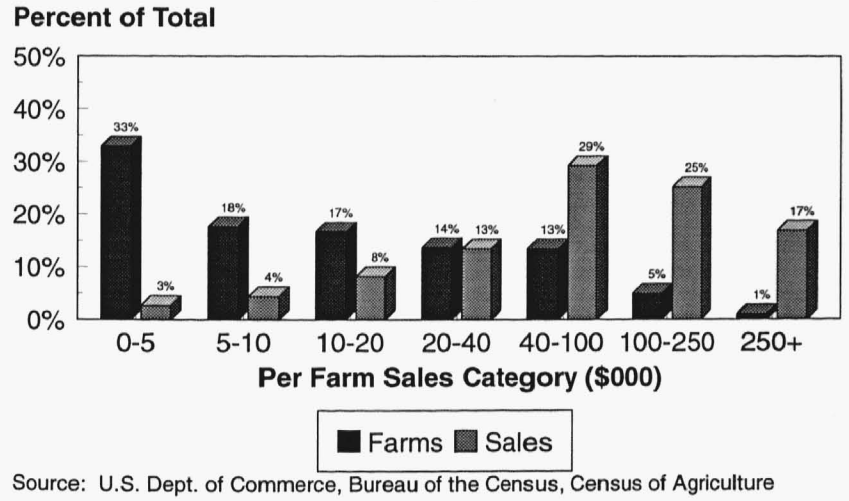
Missouri's largest farms are responsible for an increasing share of the state's agricultural output. This production trend is manifested in a "dual-structure" among Missouri farms. At one end of the distribution are a large number of small farms, making a relatively small contribution to the state's total agricultural output. These farms depend largely on retirement income, off-farm employment or other nonagricultural income sources for their sustenance. The opposite end of the distribution is composed of a few, large farms which produce and sell the overwhelming majority of Missouri's agricultural products. Operators of middle-sized farms have had to choose between expanding output to generate sufficient income, or seeking off-farm income sources and scaling back farm operations.

Distribution of Missouri Farms and Agricultural Sales

1992



1978



Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

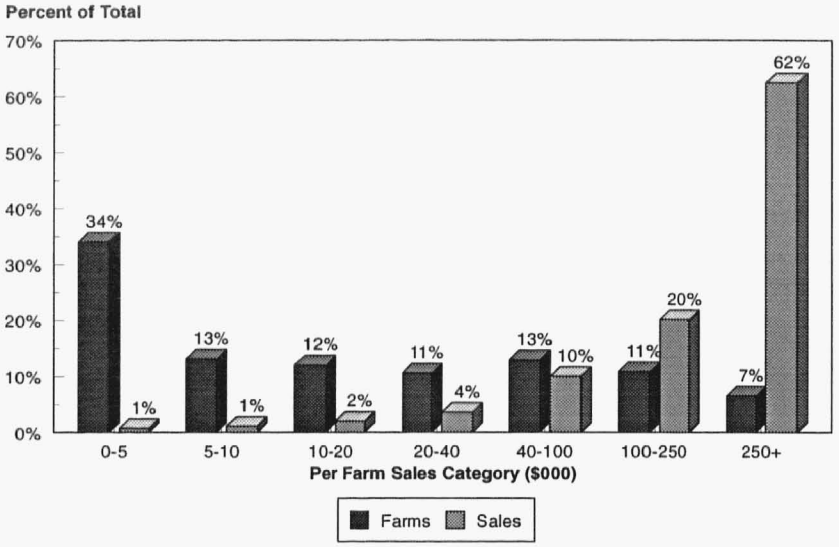
In 1978, 6 percent of Missouri farms had $100,000 or more in agricultural sales, and collectively accounted for 42 percent of the state's agricultural sales. By 1992, 11 percent of Missouri's 98,082 farms fell into this sales category and together sold 68 percent of the state's total agricultural products. By contrast, in 1992,

52 percent of Missouri's farms had less than $10,000 in sales each, and collectively accounted for just 5 percent of the state's agricultural sales. Farms in the intermediate categories, with annual sales between $10,000 and $100,000, constituted 44 percent of total farms and sold 50 percent of agricultural products in 1978. By 1992, farms with sales between $10,000 and $100,000 were 38 percent of all farms and accounted for just 27 percent of Missouri's agricultural sales.

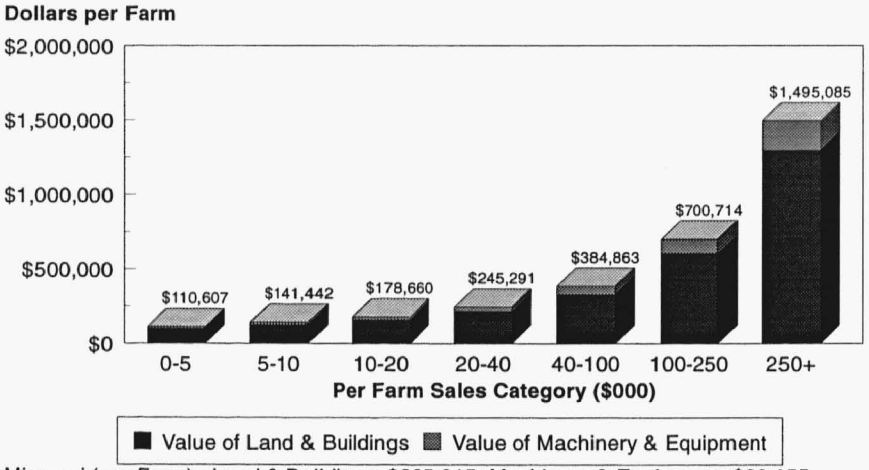
Agricultural sales for the United States as a whole are even more concentrated among the largest farms. In 1992, 18 percent of all farms in the United States had sales of $100,000 or more each, and collectively made up 82 percent of total U.S. agricultural sales. The 47 percent of U.S. farms with $10,000 or less in sales in 1992 collectively accounted for just 2 percent of total sales.

Missouri's largest farms control an asset base of a considerably different magnitude than the average Missouri farm. In 1992, the average Missouri farm utilized land,

Distribution of United States Farms and Agricultural Sales, 1992



Market Value of Land, Buildings, Machinery and Equipment per Farm, by Sales Category, 1992



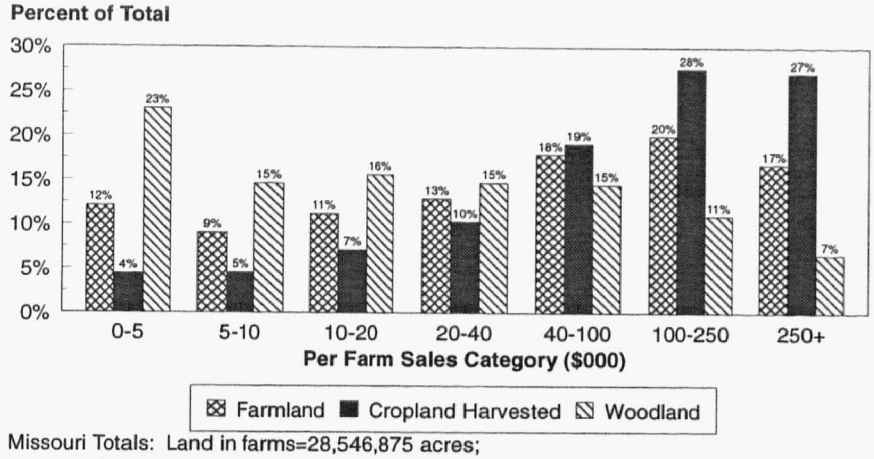
Missouri (per Farm): Land & Buildings=$225,015; Machinery & Equipment=$36,155
Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

buildings, machinery and equipment valued at $261,170 in its farm operations. The smallest 52 percent of Missouri farms averaged under $145,000 per farm in land, buildings and machinery. By contrast, the 4 percent of Missouri farms with sales of $250,000 or more had an average of nearly $1.5 million worth of land, buildings, machinery and equipment per farm.

Missouri's largest farms control a majority of the state's cropland. The 11 percent of Missouri farms with $100,000 or more in sales controlled just 37 percent of Missouri's total farmland, but 55 percent of the 12.2 million acres on which crops were harvested in 1992. The smallest Missouri farms control a disproportionate share of the 4.5 million acres of woodland in farms in the state. The 52 percent of Missouri farms with under $10,000 in sales farmed just 21 percent of Missouri's farmland in 1992, but 38 percent of woodland in farms was contained in these units.

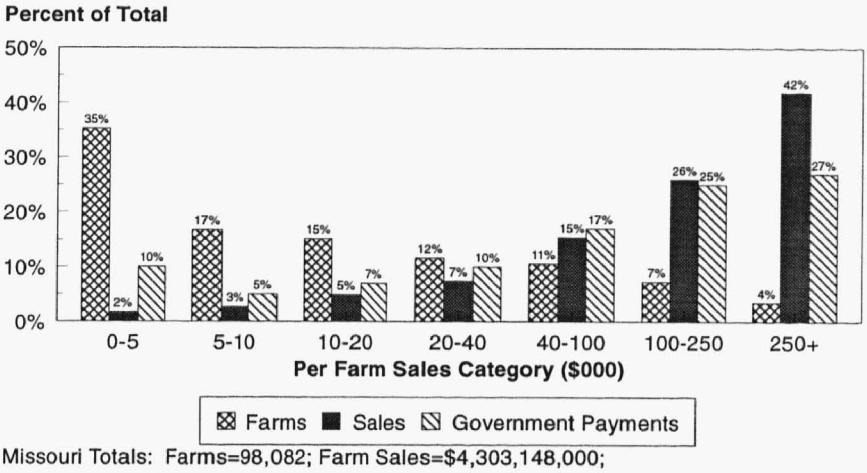
Government payments, which include both commodity program deficiency payments and Con-

Distribution of Missouri's Total Farmland, Cropland Harvested and Woodland in Farms by Sales Category, 1992



Missouri Totals: Land in farms=28,546,875 acres;
Harvested Cropland=12,158,832 acres; Woodland in Farms=4,505,178 acres
Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

Distribution of Missouri Farms, Farm Sales and Government Payments by Sales Category, 1992

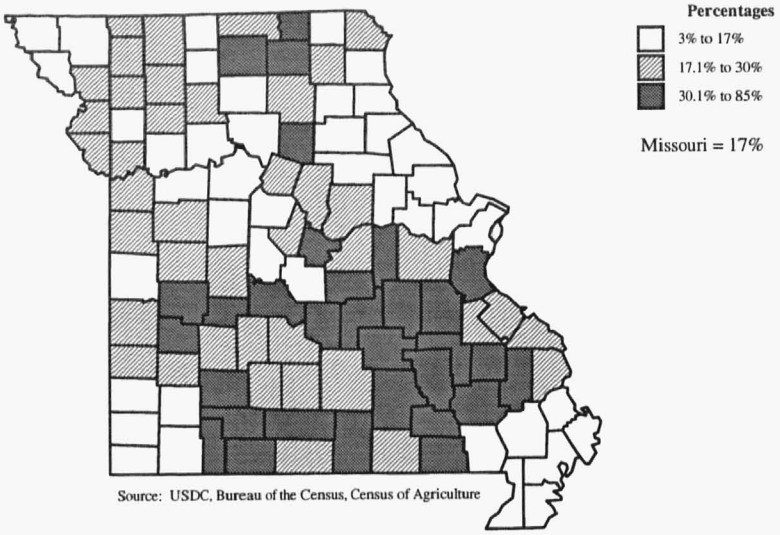


Missouri Totals: Farms=98,082; Farm Sales=$4,303,148,000;
Government Payments Received = $179,086,000
Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

servation Reserve Program (CRP) payments, are also concentrated among the largest farms. The 11 percent of Missouri farms selling $100,000 or more in agricultural products in 1992 received 52 percent of all government agricultural payments. Government payments would be even more concentrated among the largest farms if CRP payments were not included. The 35 percent of Missouri farms with under $5,000 in agricultural sales sold only 2 percent of agricultural products, but received 10 percent of government payments to agriculture in 1992. These government dollars are primarily from CRP payments. Missouri farms with under $5,000 in sales hold 24 percent of the state's CRP land in farms.

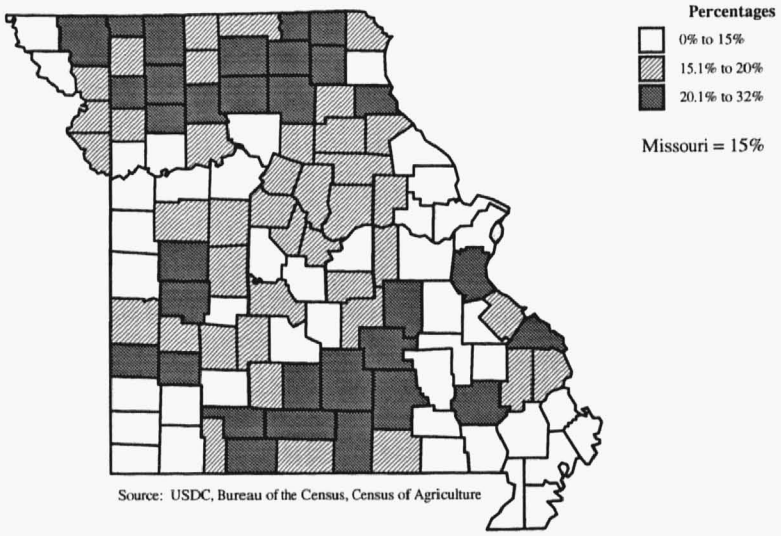
The prevalence of large- and small-scale agriculture varies widely among different geographic regions of Missouri. At the state level, small, generally part-time farms, with less than $40,000 in annual sales, contribute 17 percent of agricultural sales. However, in 31 Missouri counties, more than 30 percent of agricultural sales come from these farms. These counties are located mostly in southern

Missouri: Percent of Total Farm Sales Coming From Farms With Sales of Under $40,000
1992



Source: USDC, Bureau of the Census, Census of Agriculture

Missouri: Percent of Total Farm Sales Coming From Farms With Sales of $40,000 to $100,000
1992



Source: USDC, Bureau of the Census, Census of Agriculture

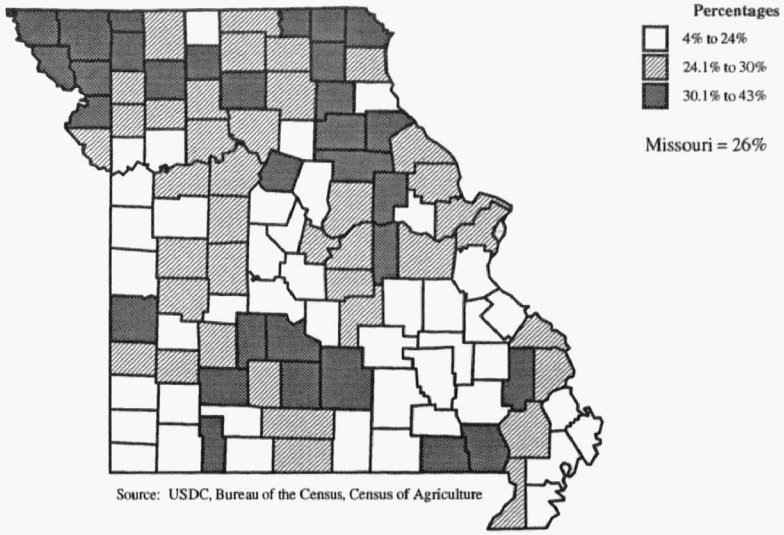
Missouri.

Fifteen percent of Missouri's agricultural sales come from farms with sales of $40,000 to $100,000. In 31 counties, scattered across northern and southern portions of the state, more than 20 percent of sales come from these mid-sized farms.

Farms with annual sales of $100,000 to $250,000 produce 26 percent of Missouri's agricultural output. In 31 Missouri counties, these farms account for over 30 percent of agricultural sales. These counties are scattered throughout the state, but three areas of concentration are in northwest and northeast Missouri and the dairy-producing counties of south-central Missouri.

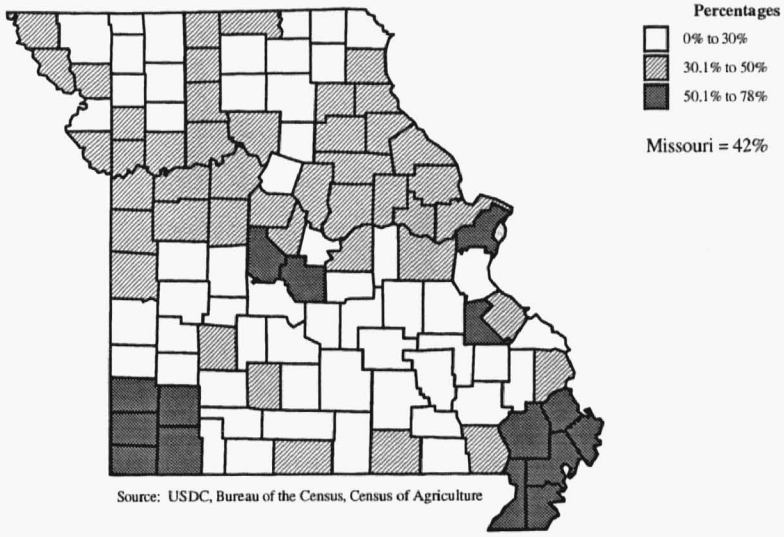
Forty-two percent of Missouri's agricultural sales come from farms with over $250,000 in annual sales. In 15 counties, over 50 percent of agricultural sales come from these farms. Those counties where over one-half of agricultural sales come from these largest farms are the poultry-producing counties in southwest and central Missouri, St. Francois and St. Louis counties, and the crop-producing counties of the Bootheel.

Missouri: Percent of Total Farm Sales Coming From Farms With Sales of $100,000 to $250,000 1992



Source: USDC, Bureau of the Census, Census of Agriculture

Missouri: Percent of Total Farm Sales Coming From Farms With Sales of $250,000 or More 1992



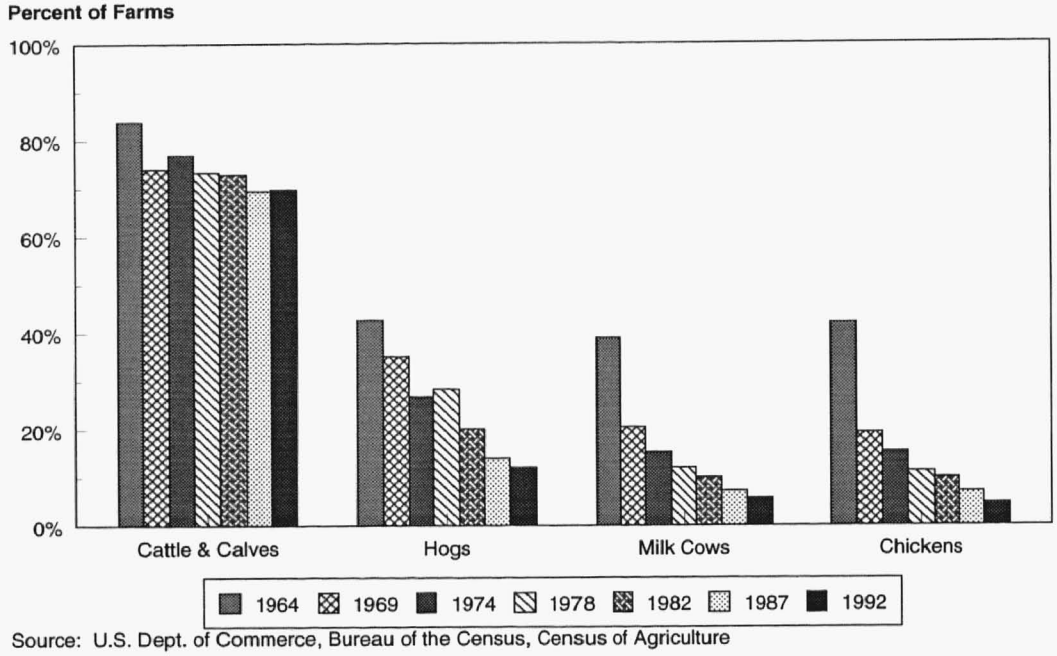
Source: USDC, Bureau of the Census, Census of Agriculture

Specialization and Growth of Livestock Production

There has been a general trend away from diversification, toward greater specialization within farm units. This is particularly true of livestock production, especially dairy, hog and poultry enterprises. Up until World War II, the milk cow and few chickens that many farms kept provided cash income to the family, as well as milk, meat and eggs for home consumption. Today, these production activities take place almost entirely within specialized dairy, egg-producing or broiler-growing enterprises. Thirty-nine percent of Missouri farms reported inventory of milk cows in 1964, and 42 percent reported inventory of chickens; by 1992, only 6 percent reported any milk cows, and 5 percent reported inventory of chickens. Until recently, hog production provided an important, flexible supplement to farm income, because producers could enter and exit with relatively small outlays of capital. Now, hog production is also moving to specialized, confinement operations; 12 percent of all Missouri farms reported hog inventory in 1992, down from 43 percent in 1964.

As a result, Missouri's current livestock sector differs from its predecessor in several important ways. New, specialized operations operate on a larger scale and utilize a significantly different mix of human, capital and biological resources in livestock production than earlier, more diversified farms. It is possible to see the extent of these differences by comparing generalized livestock farms in the state

Proportion of Missouri Farms Having Inventories of Selected Livestock



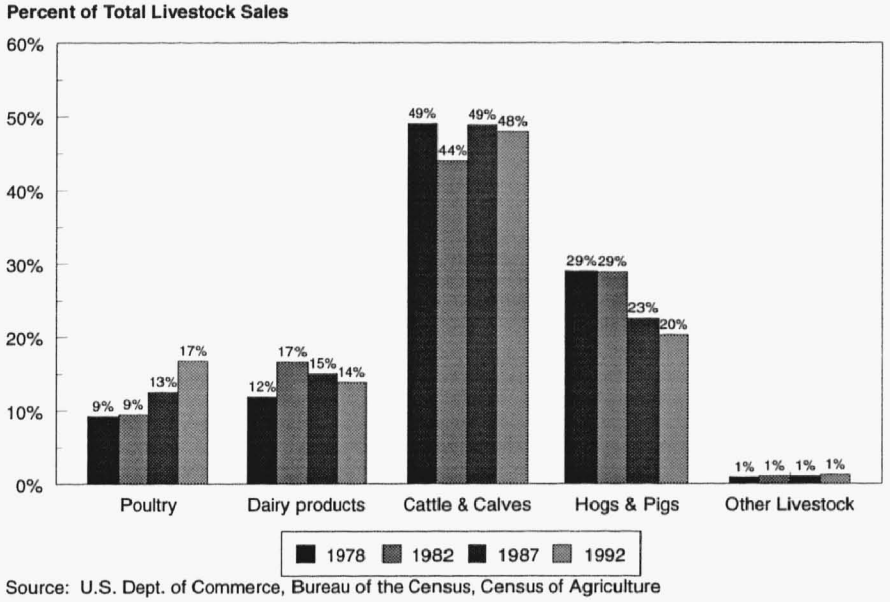
Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

to farms specializing in poultry production, the most specialized and "industrialized" of the livestock sectors.

A total of 58,818 Missouri farms were classified as primarily "livestock farms", excluding poultry and dairy in 1992; 920 farms were classified as primarily "poultry and egg" producers. The 58,818 general livestock farms average $27,836 each in annual sales; the 920 poultry farms averaged $461,156 each in sales, and just 212 of these 920 farms produced 92 percent of the state's total output of poultry and eggs. Poultry farms employed larger amounts of hired labor in the production process than general livestock farms. Fifty-one percent of the 920 poultry farms used hired labor, averaging $31,197 in annual hired labor expense per farm. Twenty-five percent of general livestock farms used hired labor, each spending an average of $3,734 per year on hired labor. Poultry farms also had larger investments in buildings and machinery. The average poultry farm reported land and buildings valued at $293,108 versus $167,732 for the average general livestock farm. Likewise, the average poultry farm had machinery and equipment investment of $59,417, versus $25,642 per farm for general livestock farms.

The production practices employed by specialized livestock farms allow animal production to be increasingly concentrated geographically. Thus, both the positive and negative impacts of increased livestock production accrue to relatively small geographic regions. In turn, these regions develop an agricultural infrastructure that is largely tied to a single type of production enterprise. For example, the top three poultry producing counties in Missouri--Barry, McDonald and Newton counties--collectively accounted for 85 percent of broiler sales, and 46 percent of all Missouri poultry sales in 1992. In turn, poultry sales accounted for 71 percent of all agricultural sales in these three counties. This dependence

MISSOURI: Distribution of Livestock Sales

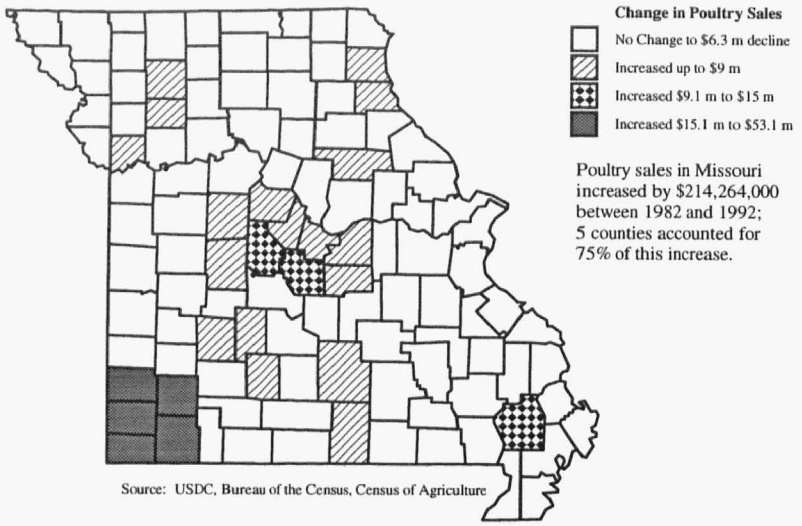


Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

on poultry sales reflects a lack of diversification in the agricultural economy of these counties. Poultry sales in Missouri more than doubled between 1982 and 1992, going from 9 percent of total livestock sales in 1982 to 17 percent in 1992, but 75 percent of this increase took place in five contiguous counties in the southwest corner of the state.

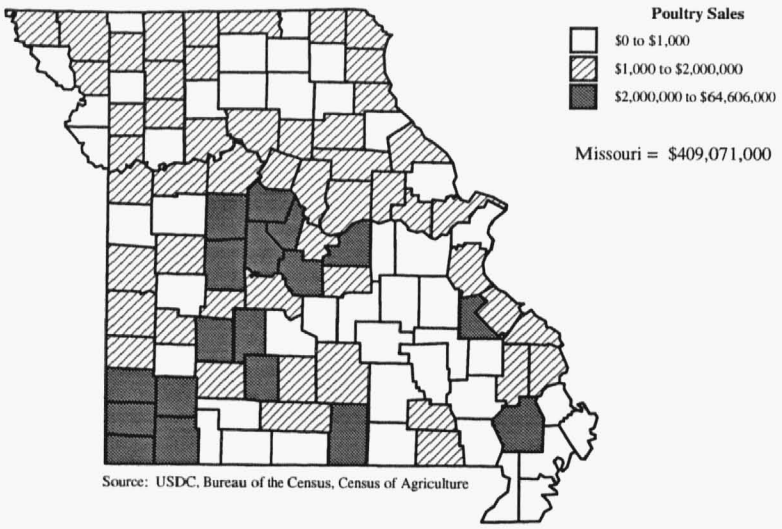
Missouri's hog production sector seems to be following poultry production in a move toward greater specialization and wider use of confinement production facilities. During the 1980s, Missouri producers were slower to adopt modern hog production practices than producers in the southeastern United States. Missouri's share of national hog inventory dropped from 7.6 percent in 1970 to 4.7 percent in 1991 and hog sales decreased from 29 percent of Missouri livestock sales in 1978 to 20 percent in 1992. There are indications this trend may be reversing, as large, specialized hog producers from other areas move into Missouri, and Missouri producers adopt modern methods. By 1994, Missouri had regained a 5.8 percent share of U.S. hog inventory.

Missouri: Change in Poultry Sales
1982 to 1992



Source: USDC, Bureau of the Census, Census of Agriculture

Missouri: Poultry Sales
1992

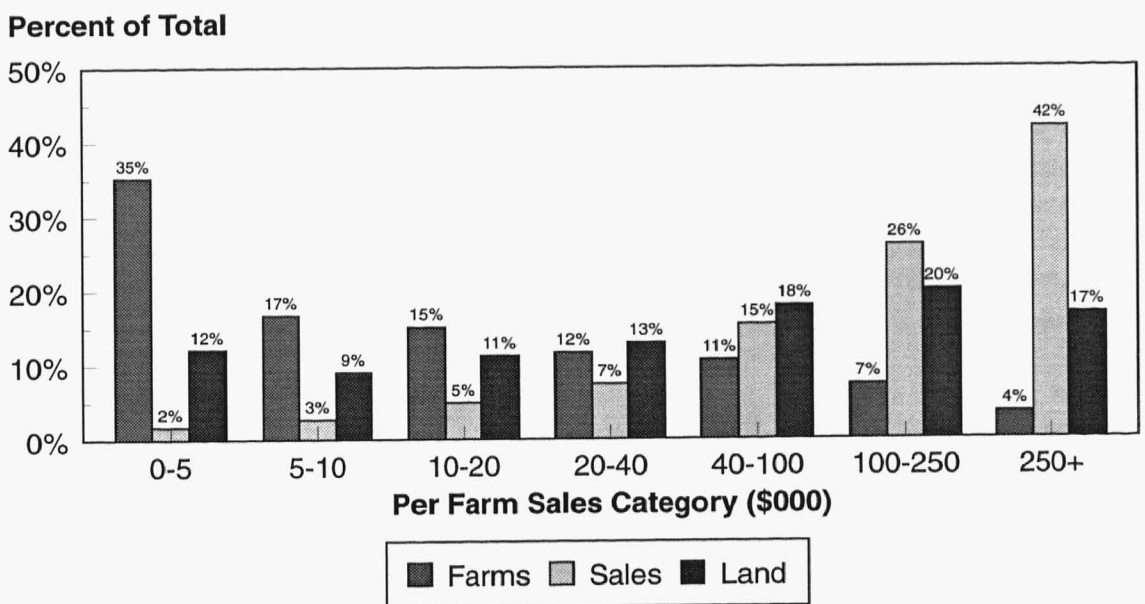


Source: USDC, Bureau of the Census, Census of Agriculture

Shift in the Spatial Concentration of Agricultural Production

Changes in agricultural production practices allow both crop and livestock production to take place in a more intensive manner, on a smaller proportion of Missouri's total farmland, than 30 years ago. While cow-calf enterprises continue to use land-extensive production methods, poultry, hog and dairy production have, to varying degrees, shifted to confinement production facilities that concentrate animal production on smaller amounts of land. Government programs to control production and limit soil erosion, combined with increased use of chemical production inputs, have also led to increased concentration of crop production on certain farmland. The net effect of these changes has been a partial separation of agricultural production from the state's agricultural land base. Farmland tends to be more evenly distributed among farms of different sizes than does agricultural production. Thus, 4 percent of Missouri farms produce 42 percent of Missouri's agricultural output, but they do so on just 17 percent of Missouri's total farmland. On the other hand, the 52 percent of Missouri farms with annual sales of less than $10,000 produce only 5 percent of Missouri's agricultural output, but control 21 percent of the

Distribution of Missouri Farms, Farm Sales and Farmland by Sales Category, 1992



Missouri Totals: Farms=98,082; Farm Sales=$4,303,148,000;
Land in farms=28,546,875 acres

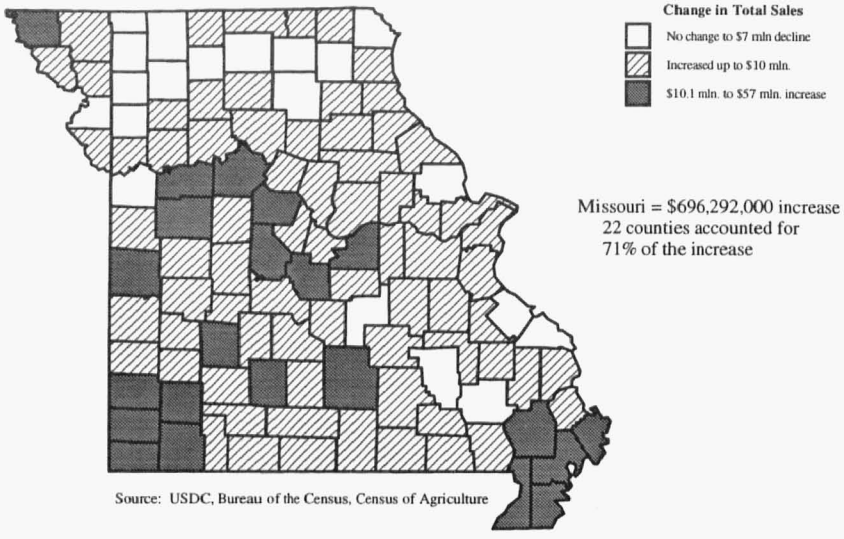
Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

state's agricultural land base.

This spatial concentration of production leads to contrasting trends in agricultural production in different regions of the state. Certain parts of the state continue to expand agricultural output, while other areas see a continued contraction in production. Total agricultural sales in Missouri increased by $696 million (nominal dollars) between 1982 and 1992, but just 22 counties accounted for 71 percent of the increase. Agricultural sales actually decreased in non-inflation-adjusted dollars between 1982 and 1992 in 20 counties. Farming makes a substantial contribution to personal income in only a few Missouri counties. Farm income accounts for 10 percent or more of total personal income (1990-92 average) in just six Missouri counties.

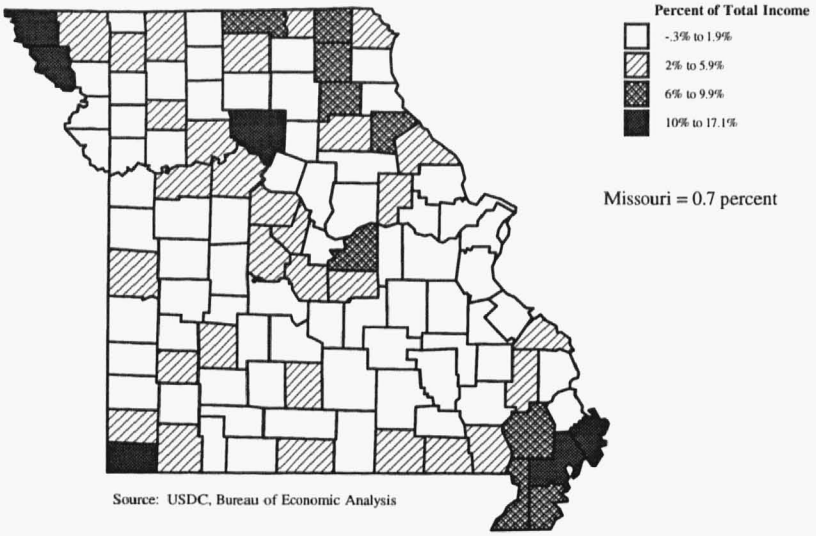
The net effect of these trends has been a long-term shift in the geographic location of agricultural production within the state. The direction of this shift has been from north to south, and from "traditional" to "non-traditional" agricul-

Missouri: Change in Market Value of Agricultural Products Sold
1982 to 1992



Source: USDC, Bureau of the Census, Census of Agriculture

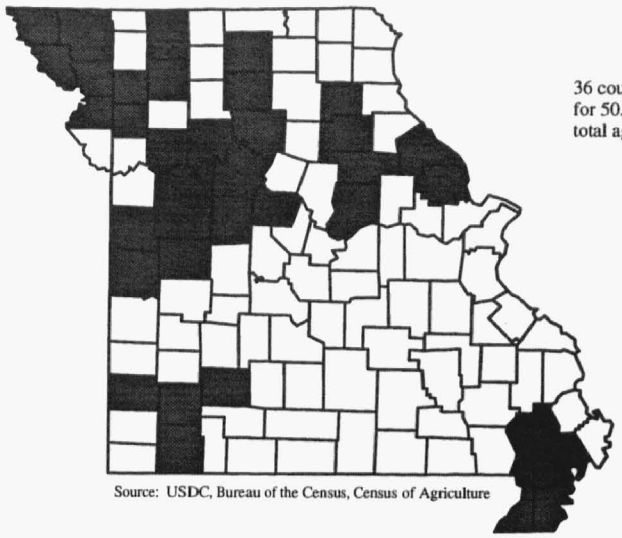
Farm Income as a Percent of Total Personal Income
1990-92 Average



Source: USDC, Bureau of Economic Analysis

tural counties. In 1969, 36 Missouri counties accounted for 50 percent of the state's agricultural sales. Twenty of these counties were north of the Missouri River, eight more were clustered just south of the River in west-central Missouri, four were Bootheel counties and four were located in southwest Missouri. Over the next 23 years, specialized crop farms in the Bootheel and specialized livestock farms in southwest Missouri expanded output more rapidly than the generally more diversified farms in north-central Missouri. By 1992, 32 counties accounted for just over 50 percent of Missouri's total agricultural sales, but the location of these counties differed significantly from 1969. Twelve counties north of the Missouri River dropped out of this top-producing group between 1969 and 1992. Three Bootheel counties and seven other counties south of the River were added to the list of those counties producing half of the state's agricultural sales.

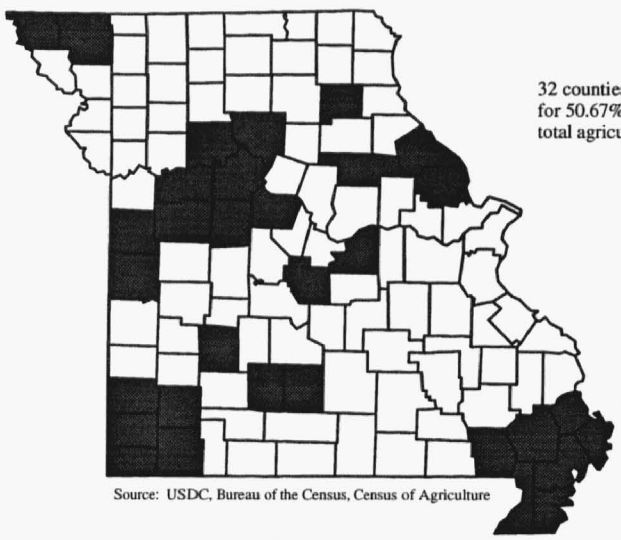
Counties Accounting for Fifty Percent of Missouri's Total Agricultural Sales 1969



36 counties accounted for 50.08% of Missouri's total agricultural sales

Source: USDC, Bureau of the Census, Census of Agriculture

Counties Accounting for Fifty Percent of Missouri's Total Agricultural Sales 1992



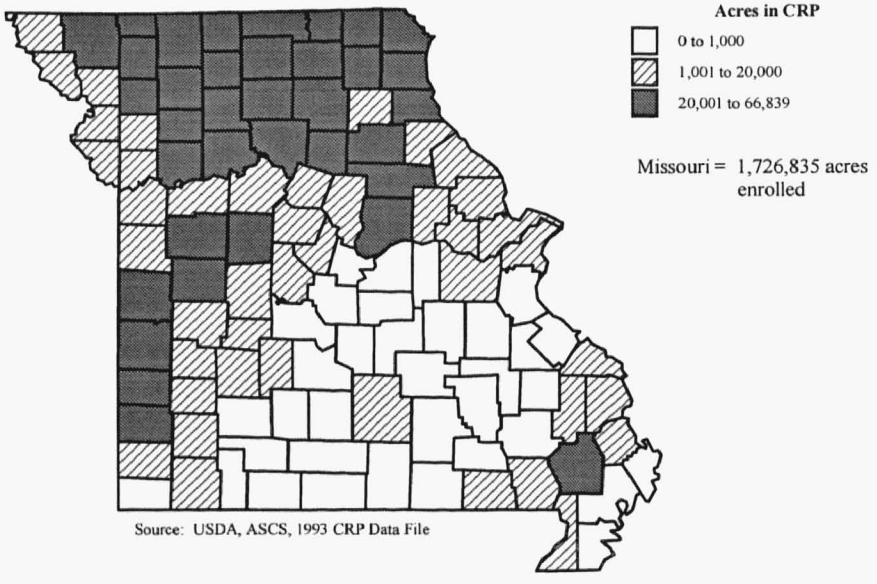
32 counties accounted for 50.67% of Missouri's total agricultural sales

Source: USDC, Bureau of the Census, Census of Agriculture

Policy Impacts: The Conservation Reserve Program

Government agricultural policies play an important role in shaping production and land use patterns in Missouri and the United States. One program that has had an important effect on Missouri agriculture in the last 10 years is the Conservation Reserve Program (CRP). The CRP was authorized by the Food Security Act of 1985, then extended and expanded to include a Wetlands Reserve Program (WRP) by the Food, Agriculture, Conservation and Trade Act of 1990. The programs provide annual payments for highly erodible land or wetlands which are enrolled in the programs and removed from agricultural production for a minimum of 10 years. In Missouri, 1,726,835 acres are enrolled in the CRP. Approximately one million of these acres are contained in farm operations as defined by the Census of Agriculture (a place selling $1,000 or more of agricultural products), and the balance are held in non-farm units. Thirty-six Missouri counties have 20,000 or more acres enrolled in the program. These counties are concentrated in north Missouri and along the Missouri-Kansas border in the southwest part of the state. In nine northern Missouri counties, land currently in the CRP amounts to 20 percent or more of 1982 total cropland (all land on which hay was cut or crops were harvested, or on which crops could have been grown without improvements in 1982). Missouri's smallest farms in terms of agricultural sales hold a disproportional share of the CRP land in farms; those farms with less than $5,000 in annual sales held 12 percent of Missouri farmland in 1992, but accounted for 24 percent of farmland in the CRP. Older farmers also hold large amounts of CRP land. Farmers 65 and older farm 24 percent of the state's farmland, but have 29 percent of farmland in the CRP. In fact, the CRP may have served as a sort of "retirement program" for those older producers who were looking to scale back production in the mid-1980s.

Missouri: Land in the Conservation Reserve Program (CRP)
1993



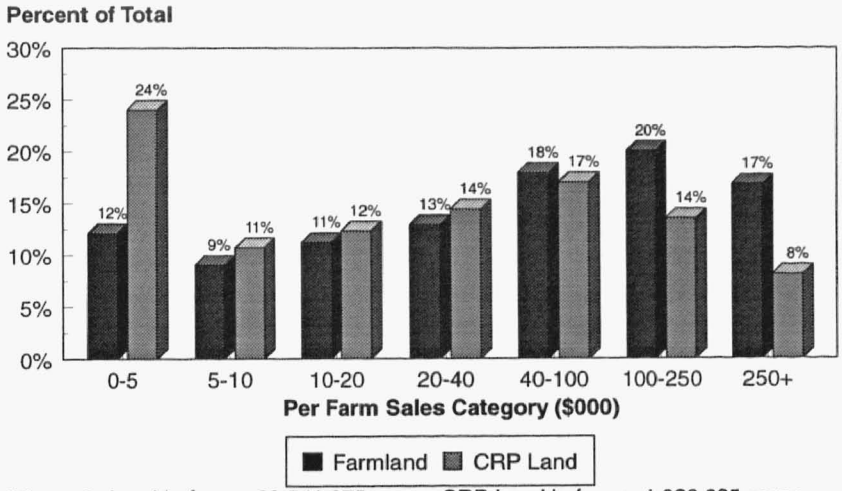
Source: USDA, ASCS, 1993 CRP Data File

Missouri received $109 million worth of CRP payments in 1993. In 30 Missouri counties, annual CRP payments amounted to $1.5 million or more. CRP payments received in these 30 counties were collectively equivalent to 29 percent of the 1992 net cash return from agricultural sales in the

counties. CRP payments received for the one million CRP acres contained in farms, as reported in the 1992 Census of Agriculture, totaled $58.6 million or 32.7 percent of all government payments to Missouri agriculture. Almost 10 percent of Missouri farms (9,484 farms) received an average of $6,177 each in CRP payments in 1992.

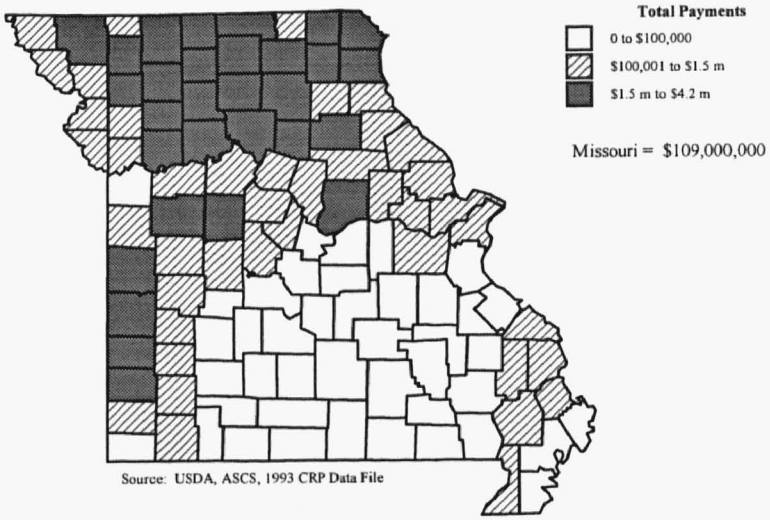
Six percent of the 1.7 million acres of Missouri land in the CRP is due to be released in 1996. Another 45 percent of Missouri CRP contracts will expire in 1997, and another 23 percent in 1998. Unless the program is extended in some way, much of this land will re-enter agricultural production. Dr. Mike Monson at the University of Missouri, in a 1989 survey funded by the Missouri Department of Natural Resources, found that producers intended to resume crop production on approximately 50 percent of CRP acreage. Producers said they would use another 40 percent of CRP land for pasture or hay, and the remaining 10 percent would remain idle or be used for nonagricultural purposes. The ultimate decision to extend or modify the CRP in the 1995 Farm Bill will have important implications for many Missouri counties.

Distribution of Missouri's Total Farmland and Farmland in the Conservation Reserve Program (CRP) by Sales Category, 1992



Missouri: Land in farms=28,546,875 acres; CRP Land in farms=1,038,935 acres
Source: U.S. Dept. of Commerce, Bureau of the Census, Census of Agriculture

Missouri: Annual Conservation Reserve Program (CRP) Payments Received 1993



Source: USDA, ASCS, 1993 CRP Data File

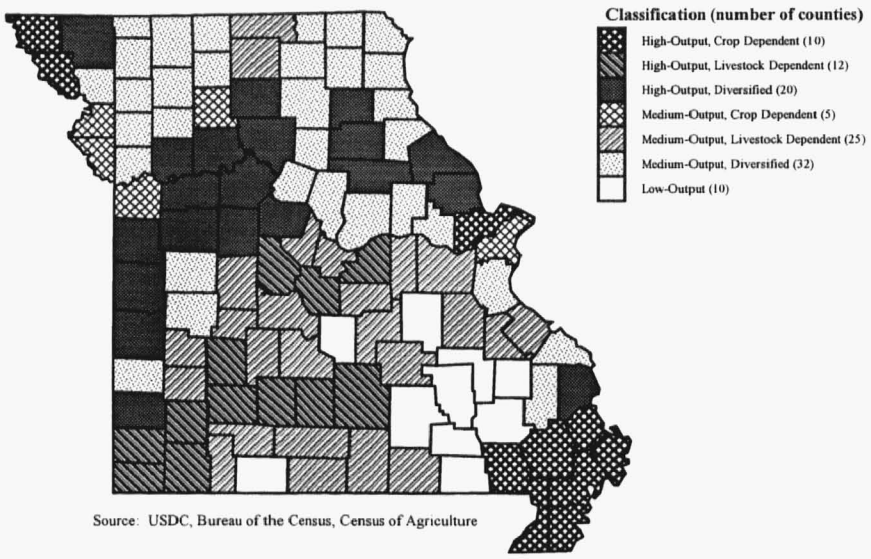
An Agricultural Typology for Missouri Counties

State-level averages for farm size, farm sales, crop yields and other indicators have little meaning in Missouri because they disguise tremendous variation in these variables on different farms throughout the state. However, in any given region of the state, the availability and quality of natural resources, the settlement patterns for the region and the availability of markets for certain commodities have combined to increase the prevalence of certain types of farms, producing certain types of products. Therefore, it is possible to identify geographically distinct regions of the state by their aggregate level of agricultural output and by the mix of crops and livestock they produce.

The following typology attempts to do this by classifying Missouri counties according to their total agricultural sales and the distribution of these sales between crops and livestock. Counties are first classified as High-Output ($40 million or more in total agricultural sales for 1992); Medium-Output ($10 million to $39.9 million in sales); or Low-Output (less than $10 million in sales). High- and Medium-Output counties are then further classified as Crop-Dependent (70 percent or more of total sales from crops); Livestock-Dependent (70 percent or more of total sales from livestock); or Diversified (neither crops nor livestock account for 70 percent or more of total agricultural sales).

Collectively, the 42 High-Output agricultural counties accounted for 61 percent of Missouri's 1992 agricultural sales. Ten of Missouri's 114 counties, concentrated in the Bootheel and northwest Missouri, are classified as High-Output, Crop-Dependent counties. Twelve Missouri counties are High-Output, Livestock-Dependent counties. They are located in an area stretching from central to southwest Missouri and focus on poultry, dairy or cow-calf production. Twenty of Missouri's High-Output counties are classified as Diversified. The Medium-Output counties north of the Missouri River tend to fall into the Diversified category, while those in the southern half of the state are largely Livestock-Dependent. Ten of Missouri's counties, clustered just northwest of the Bootheel, had less than $10 million in agricultural sales in 1992 and are classified as Low-Output agricultural counties.

Agricultural Typology of Missouri Counties
1992



Source: USDC, Bureau of the Census, Census of Agriculture

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