

# ***The Changing Economic Structure of Oklahoma Agriculture***

by

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## SUMMARY

This study was made to determine some of the changes which have occurred and are occurring in Oklahoma's farm income, resources and output.

Income per Oklahoma farm worker averaged 59 percent of the income per U. S. farm worker in the 1950-54 period. The percentage increased to 61 percent for the 1959-63 period. This small relative gain hides important changes made by Oklahoma farmers in resources, crops, and livestock to raise income and efficiency.

The purchasing power per unit of what farmers sold fell 14 percent during the period above, yet average annual real net income per farm increased slightly from \$1988 (1950-54) to \$2016 (1959-63) because of increased production and size of farms. The average farm was 255 acres in 1950, 411 acres in 1963. Oklahoma farmers irrigated 34,071 acres and applied 146,000 tons of fertilizer in 1950 compared to 197,632 irrigated acres and 264,000 tons fertilizer in 1960.

Increased use of fertilizer and irrigation is a sign of more intensive agriculture—other signs point to a less intensive agriculture. For example, in the decade following 1959, cropland acreage fell 11 percent while pasture acreage rose 13 percent.

Major changes are apparent in the composition of crop and livestock production. Between 1929 and 1963, the proportion of total farm income obtained from the sale of livestock increased from 19 percent to 47 percent. Cattle and calves made spectacular gains, while hogs, dairy and poultry lost ground as contributors to farm income.

The expansion in farm size on a fixed total land area means fewer farms. The number of farm operators in the state declined from 203,866 in 1929 to 94,678 in 1959. The farm population and hired worker numbers show downward trends similar to operators.

The above trends in Oklahoma agriculture can be expected to continue. The cost-price squeeze and attendant low profit margins will mean future pressure for farm enlargement and fewer operators. The data suggest that farmers will need to be alert for ways to improve their level of management and efficiency of their operation. In some instances, shifts to dairy, hogs or other specialized enterprises can raise earnings. In other instances a shift from native grass to bermuda grass or installation of an irrigation system will increase net income. Farmers will also seek part time off-farm employment and farm enlargement

through rent or purchase to expand economic opportunity. Many will leave the farm for full time urban employment. There is no one answer to all the economic problems facing farmers; each situation must be evaluated individually.

The data show that opportunities to be future farm operators of adequate units will be limited to a comparatively small proportion of farm youth who will have substantial financial backing and managerial skills. However, employment opportunities are great in the broader area of agriculture that includes the growing agribusiness complex supplying inputs to farmers and processing, transporting and marketing farm produced commodities. While job opportunities are sizeable in this field, adequate preparation is basic. Each farm youth must obtain the best education possible to raise his level of managerial ability and flexibility for alternate types of farm or nonfarm employment.

# The Changing Economic Structure of Oklahoma Agriculture

by  
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Dramatic changes have taken place in Oklahoma agriculture in the past three decades. Numerous forces underlie these changes, but many can be broadly classified under the heading "technology." Technology in the form of mechanization, improved fertilizers and crop varieties, animal breeding, new pesticides and greater managerial and technical skills on the part of individual farmers has brought great changes to Oklahoma farms. This publication documents some of these changes in farm income, resources and output.

Advocates of national economic growth have had reason to be pleased over changes in farm productivity caused by technology. Costs of crop and livestock production have been reduced. Fewer laborers are needed to meet the nation's requirements for food and fiber. Human resources freed from the necessity to provide food have found employment supplying air conditioners, autos, TV's, stereos and other items demanded by consumers as their income advances in the process of economic growth.

Increasing output per input and expanding productivity per farm worker have contributed significantly to national economic growth. But there are also problems. Increased production (through improved technology on farms throughout the nation) has reduced the ratio of prices received to prices paid by farmers. To adjust to changing economic conditions, the individual farmer finds he must either obtain a larger resource base (increase land and capital), be satisfied with a lower income, or seek off-farm employment. This publication illustrates the trend to farms that are larger in acreage and capital in Oklahoma. With land area essentially stable, the "other side of the coin" is fewer farms, farm people and farm workers. Many Oklahomans have left the farm to find employment elsewhere. Unfortunately, some farmers have remained aloof from the mainstream of economic change, and have remained static on small, inefficient, low income farms.

There is much drama in all these changes that escape the impersonal graphs, tables and commentary of the subsequent sections. The economic

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\*Respectively, Research Associate and Associate Professor. Research reported herein was conducted under Oklahoma Station Project 1175.

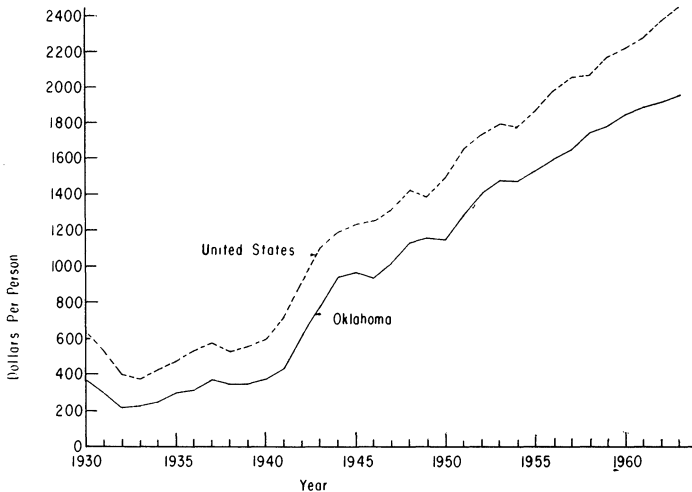
description does not grasp the pathos in this inexorable growth and progress. But it is important that we are aware of the economic trends in agriculture, thereby to prepare for and (if need be) cushion or change the adjustments likely to occur.

*A complete set of tables containing the data used to construct the graphs and charts can be obtained by request from the Department of Agricultural Economics, Oklahoma State University, Stillwater.*

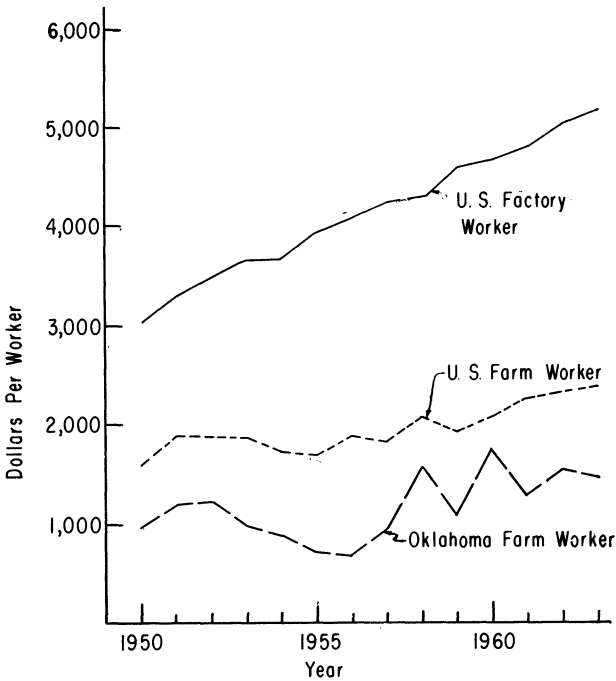
## CHANGES IN OKLAHOMA FARM AND NONFARM INCOME

Personal income per capita (including all farm and nonfarm persons) for the United States and Oklahoma is shown in Figure 1 for the period 1930-63. Annually from 1930 to 1935, Oklahoma per capita personal income averaged 57 percent of U. S. per capita personal income. The ratio of Oklahoma to U. S. per capita income increased after the 1930's, but the absolute differences in monetary income grew wider. During the period 1959-63, per capita personal income in Oklahoma averaged 82 percent of U. S. per capita personal income.

Figure 2 illustrates the level of farm and factory worker income from 1950 to 1963. In 1963, average U. S. factory worker income totaled



**Figure 1. Trends in Per Capita Personal Income, United States and Oklahoma 1930-1963**

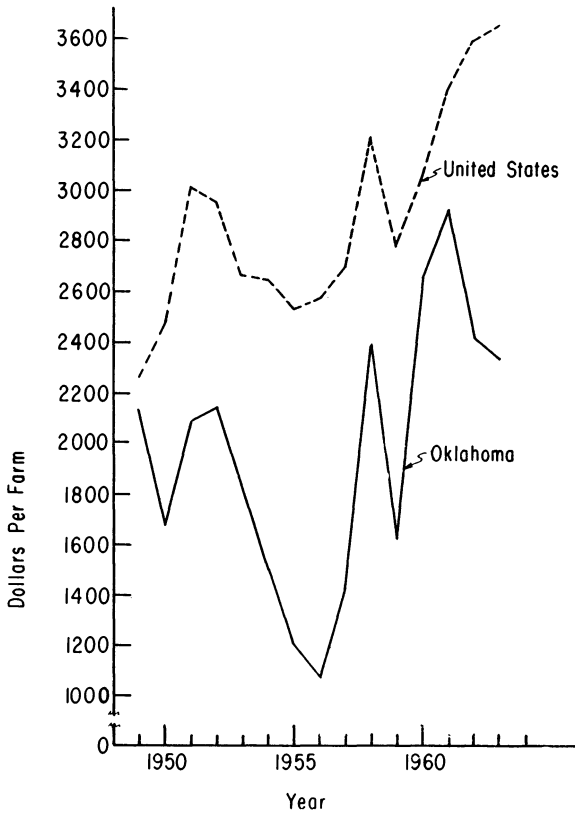


**Figure 2. Average Annual Income of U. S. Factory Worker, U. S. Farm Worker, and Oklahoma Farm Worker, 1950-1963**

\$5,168 as compared to \$2,375 and \$1,478 for U. S. and Oklahoma farm workers, respectively. The average income of Oklahoma farm workers was 62 percent that of U. S. farm workers in 1963.

Differences in real income are less than the data suggest. First, costs of living are low on Oklahoma farms, and a given money income goes farther than in other occupations or areas. Second, the number of farm workers includes hired workers and all family workers—many of them wives, sons and daughters of operators—who work only part time for the farm business. Therefore, income comparisons between farm and nonfarm families are more favorable to the farm sector than are income comparisons between individual workers. Figure 3 compares Oklahoma and U. S. net income per farm during the period 1949-63. During the five-year period, 1959-63, net income per farm in Oklahoma averaged 72.7 percent of net income per farm in the U. S.

Table 1 shows U. S. and Oklahoma “real” farm income per farm and per farm worker since 1950. Real farm income has been adjusted for



**Figure 3. Total Net Farm Income Per Farm, United States and Oklahoma, 1949-1963**

**Table 1. Real Income of Farms and Farm Workers, U. S. and Oklahoma, 1950-63.<sup>1</sup>**

Year	Per Farm		Per Worker	
	U. S.	Oklahoma	U. S.	Oklahoma
	(Dollars)		(Dollars)	
1950	2,883	1,948	1,858	1,123
1951	3,201	2,219	2,001	1,257
1952	3,139	2,251	1,981	1,297
1953	2,834	1,930	2,003	1,061
1954	2,814	1,591	1,837	930
1955	2,690	1,278	1,806	762
1956	2,681	1,124	1,967	710
1957	2,722	1,437	1,840	970
1958	3,201	2,382	2,064	1,537
1959	2,748	1,608	1,909	1,043
1960	3,014	2,624	2,054	1,269
1961	3,323	2,859	2,207	1,257
1962	3,477	2,348	2,259	1,497
1963	3,503	2,248	2,284	1,421

<sup>1</sup> Actual income data were deflated by Index of prices paid by U. S. farmers for family living items, 1957-1959=100.

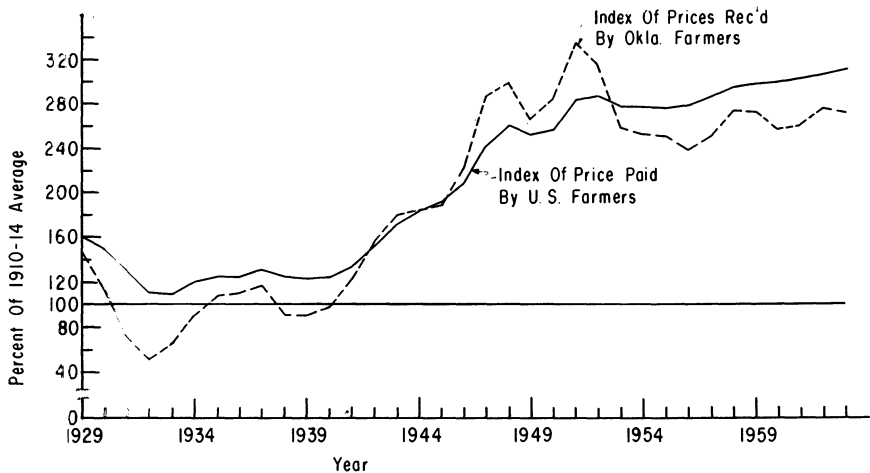


changes in the price level and thus gives a clearer insight into the buying power of income received by farmers. During the five-year period, 1950-54, Oklahoma real farm income per farm and farm worker represented 67 percent and 59 percent, respectively, of U. S. real farm income. These percentages had increased to 73 percent and 61 percent, respectively, by 1959-63. Over the entire period, real income in Oklahoma per farm and per farm worker was somewhat erratic but, in general, trended upward. Average annual real income per farm in Oklahoma from 1950 to 1954 was \$1,988. The average had increased to \$2,337 during the 1959-62 period, an 18 percent increment. Average real annual income per farm worker in Oklahoma increased 14 percent from 1950-54 to 1959-63—from \$1,134 to \$1,297.

### **Changes in Prices Received and Paid by Oklahoma Farmers**

A further view of the economic position of Oklahoma agriculture is gained from changes in prices received and paid by farmers. Figure 4 illustrates these price indices as a percent of the 1910-14 average price. In 1963, prices received from all farm products by Oklahoma farmers were 2.7 times those received in 1910-14. However, prices paid by farmers<sup>1</sup> were 3.1 times those paid in the base period. Therefore, although

<sup>1</sup>The ratio of prices received by Oklahoma farmers to prices paid by U. S. farmers was used because the index of prices paid by Oklahoma farmers is not available. Prices paid indices in Oklahoma and the U. S. tend to be similar because of the stability of input prices over the nation.



**Figure 4. Index Numbers of Prices Received and Paid by Oklahoma and U. S. Farmers. 1929-1963**

absolute income was considerably higher, a "real" dollar of farm income had a purchasing power equal to only 87 percent of its purchasing power in 1910-14.

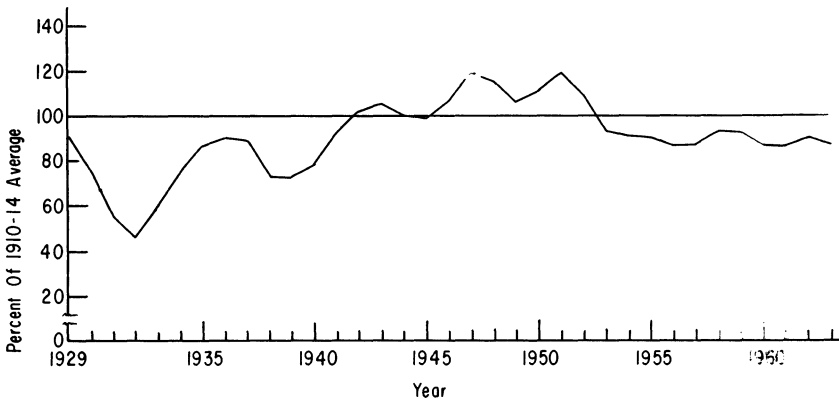
The purchasing power index or parity ratio (Index of prices received  $\times$  100  $\div$  Index of prices paid) for all Oklahoma farm commodities is shown in Figure 5 for the period 1929-63. Due to greater farming efficiency and sales volume per farm now than in earlier periods, the decreased terms of trade (parity ratio) since 1951 does not necessarily mean that all farmers are worse off. Greater specialization, larger size units and more efficient methods of farming permit operators to achieve a given labor income with a lower parity ratio than in the 1910-14 period.

### Differences in Farm Income and Value of Farm Marketings Among Counties in Oklahoma

Sizeable variation in farm income among Oklahoma counties has resulted from differences in farm size and rainfall; and in soil topography, fertility and structure. Median net farm family income in Oklahoma, illustrated by counties for 1960 in Figure 6, was highest in Harper County (\$5,982) and lowest in Pushmataha County (\$1,965). Median net farm family income for the entire state in 1960 was \$3,361.<sup>2</sup>

The pattern of farm marketings per farm by counties (Figure 7) is similar to median farm family income (Figure 6). In 1959, Cimarron County had the highest gross farm income (value of farm marketing) with

<sup>2</sup> Median family income is that income level where one-half of the families under consideration have income below the median and one-half the families have incomes above the median.



**Figure 5. Ratio of Index of Prices Received by Oklahoma Farmers to Prices Paid, 1929-1963**

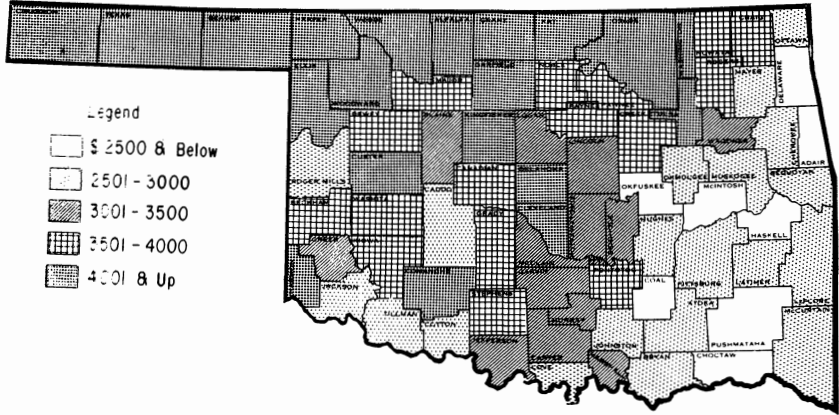


Figure 6. Median Farm Family Income By Counties, Oklahoma, 1960

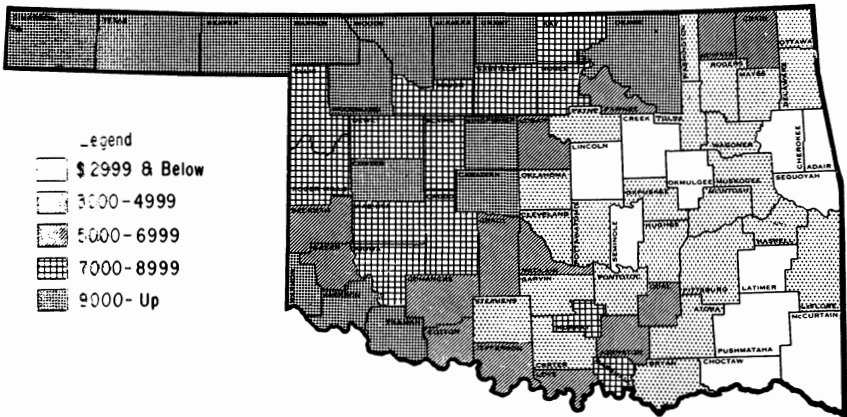
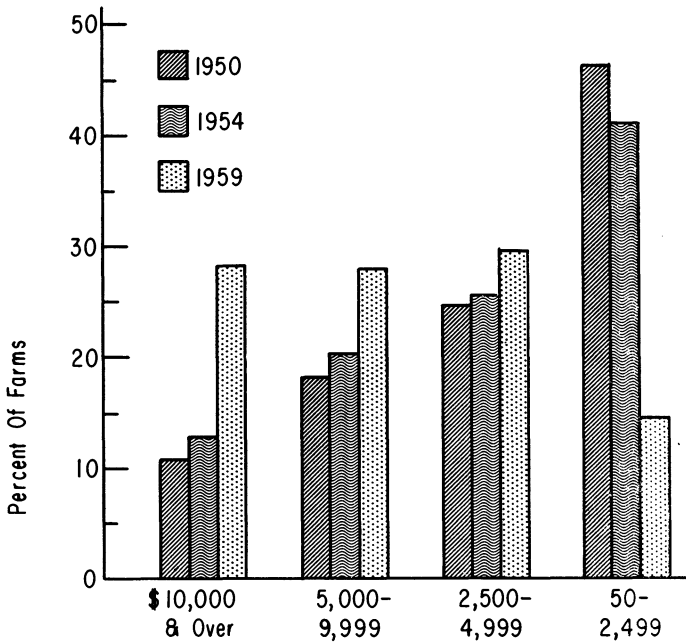


Figure 7. Value of All Farm Products Sold Per Farm By Counties, Oklahoma, 1959

\$22,830, while McCurtain County had the smallest gross farm income per farm of \$2,034 (Figure 7). Again, the western and northern portions of Oklahoma ranked high.

### Changes in Value of Farm Marketings Per Farm

Figure 8 shows the distribution of Oklahoma farms by economic classes for the Census years 1950, 1954, and 1959. Farms with annual sales of \$10,000 and over increased from 10.8 percent to 28.2 percent of all



**Figure 8. Percentage of Oklahoma Farms In Economic Classes, 1950, 1954 and 1959**

farms from 1950 to 1959 while farms with annual sales of from \$50 to \$2,499 decreased from 46.3 percent to 14.4 percent. An increasing proportion of farms are moving into larger economic size classes through time.

### Changes in Sources of Farm Income in Oklahoma

Total income to Oklahoma farmers comes from nonfarm as well as from farm sources. In 1959, over 54 percent of farm operators in the State reported some off-farm work during the year. In fact, 32 percent had nonfarm incomes exceeding income from the sale of farm products. Income from nonfarm sources has increased substantially in the last three decades as farmers have felt the need to expand their incomes beyond what their farming operation is capable of yielding, and as non-farm employment in industry, government, etc. has become more readily available to farmers. The following discussion and Figure 9 are concerned only with farmer income from farm sources and the relative shares of major farm commodities in making up income from farm sources. But, it should be realized that income from off-farm employment probably

makes up at least 20 percent of total farm income and is becoming of greater importance as a source of income to Oklahoma farmers each year.

The sources of income from farming operations in Oklahoma have undergone vast changes in the last 30 years (Figure 9). In general, livestock and livestock products have accounted for an increasing portion of total farm income while income from crops has declined in relative importance. In 1929, the sale of livestock and livestock products comprised 37 percent of total farm income in the State. By 1963, this figure had increased to 59 percent. During the same time interval, the percentage of total farm income from crops decreased from 63 percent to 41 percent.

A further breakdown of the changes in the sources of Oklahoma farm income indicates that from 1929 to 1963 income from meat animals increased as a proportion of total income from 19 percent to 47 percent. Income from cattle and calves alone increased from 13.5 percent to 40.6 percent while income from the sale of hogs declined from 5.1 percent to 2.8 percent of total farm income between 1929 and 1963. The percentage of farm income from dairy products remained relatively stable over the same period. Meanwhile, earnings from poultry decreased from 8.5 percent to only 3.3 percent of total farm income. The percentage of total income from wheat increased from 13.7 percent in 1929 to 19.1 percent in 1963. Income from cotton decreased as a percent of total farm income from 37.0 in 1929 to only 7.0 in 1963.

### Changes in Level of Living on Oklahoma Farms

Over the last 30 years, farm families in Oklahoma have enjoyed an increasing standard of living based on the number of farm home con-

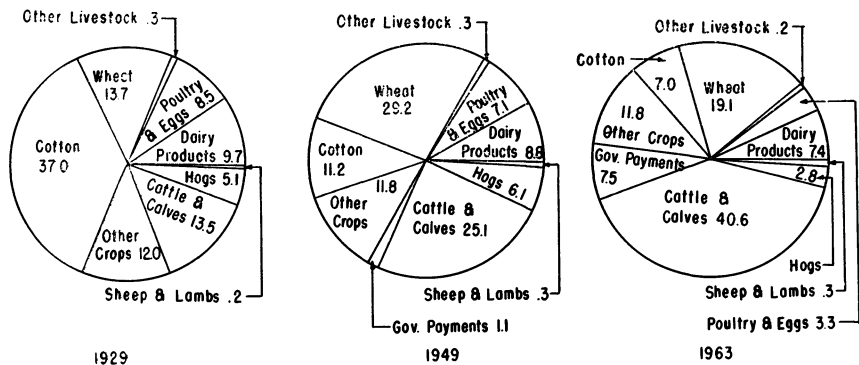


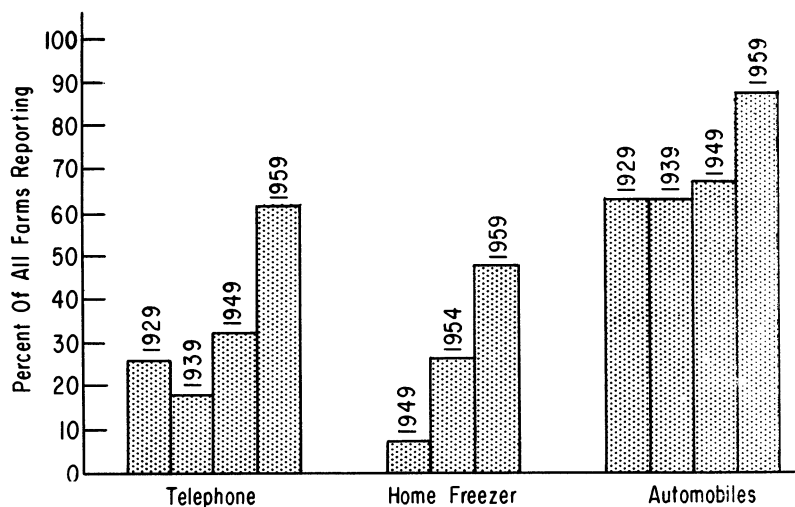
Figure 9. Relative Changes in Sources of Farm Income from Farm Crops and Livestock in Oklahoma 1929, 1949 and 1963 (percent of Cash Farm Income)

veniences. Somewhat limited data from the Census of Agriculture in Figure 10 give some insight into the rate of increase in the number of telephones, home freezers, and automobiles owned by farm families. The percentage of Oklahoma farm homes having telephones increased from 26 percent in 1929 to 61 percent in 1959 while percentages of farm families owning automobiles increased from 62 percent to 87 percent. In 1959, 48 percent of Oklahoma farm homes were equipped with a home freezer as compared to only 7.3 percent in 1949.

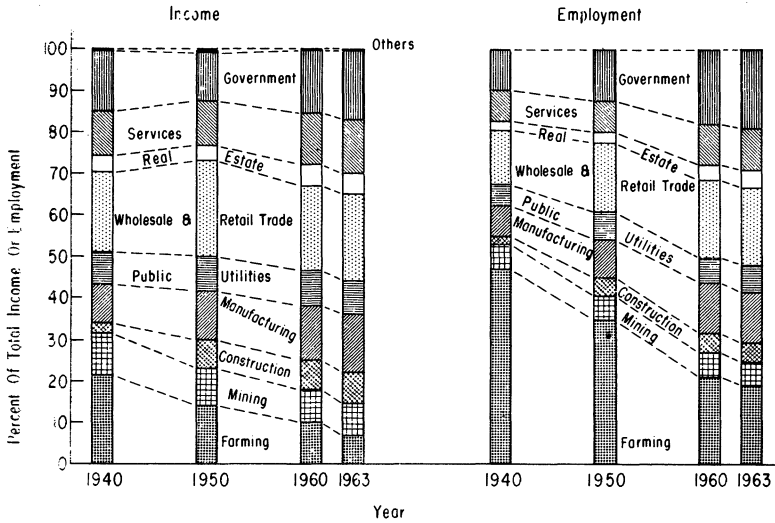
### **Changes in Sources of Income and Employment in Oklahoma**

In Oklahoma, farming has decreased in relative importance as a source of income and employment since 1940 (Figure 11). In 1940, farming operations accounted for 22 percent of all Oklahoma income and for 47 percent of all workers employed in the state. By 1963, the percent of total Oklahoma income earned on the farm and the percent of all Oklahoma workers employed in farming activities had declined to 6.7 percent and 19 percent, respectively. The fact that since 1940 the share of state employment on farms exceeded the share of state income from farming reflects the lower earnings of farmers depicted earlier in Figure 2.

Mining (including oil) has also declined in relative importance as a source of income but remained somewhat stable on a percentage basis



**Figure 10. Trends in Percentages of Farms Reporting Telephones, Home Freezers, and Automobiles, Selected Census Years, 1929-1959**



**Figure 11. Sources of Income and Employment in Oklahoma, Selected Years, 1940-1963**

as a source of employment in Oklahoma since 1940. The government and manufacturing sectors have been growing sources of income and employment. From 1940 to 1963, the percent of all Oklahoma income obtained from government employment increased from 15.4 percent to 16.9 percent. In the same period, the proportion of all Oklahoma workers employed by the government increased from 10.2 percent to 18.9 percent. The share of total Oklahoma income from manufacturing from 1940 to 1963 increased from 9.3 percent to 13.9 percent. Meanwhile the employment in manufacturing rose from 7.2 to 12.0 percent of the state total.

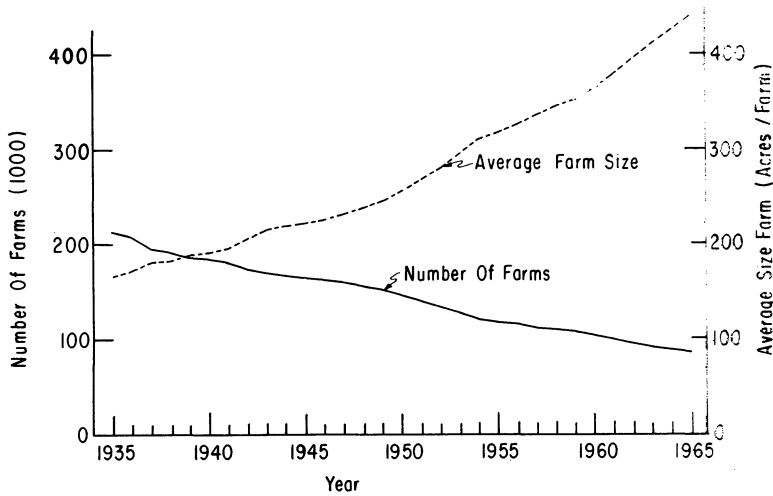
## CHANGES IN FARM RESOURCES AND EFFICIENCY

Significant adjustments have been made in the quantity and quality of resources used by Oklahoma farmers. The major change has been the substitution of purchased capital inputs, supplied by the nonfarm sector, for manual labor, horses and mules supplied by the farm. A growing investment in farm machinery has permitted one operator to handle a much larger operation.

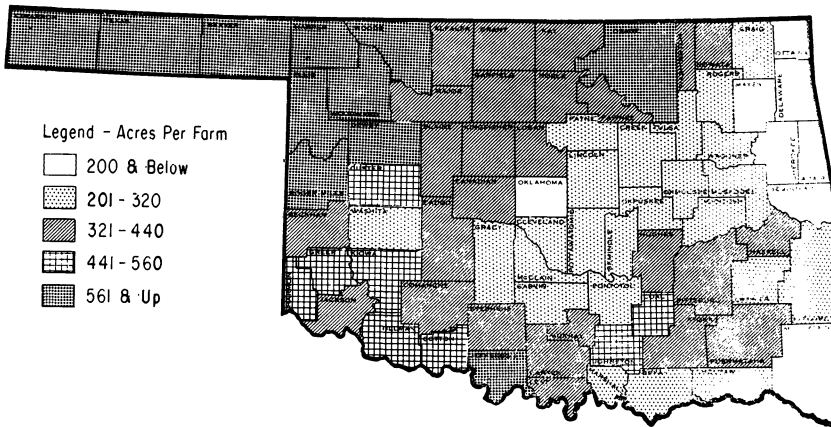
### Changes in Farm Size

Figure 12 shows the changes in farm numbers and average size of farms in Oklahoma from 1935 to 1965. During the period, farm numbers

declined from 214 thousand to 85 thousand (about 60 percent) while average farm size more than doubled—increasing from 166 acres to 439 acres. Figure 13, illustrating differences in farm size among Oklahoma counties in 1959, clearly shows the tendency of the western portion of the state to be characterized by large farms. Average farm size in 1959 ranged from 2,001 acres in Cimarron County to only 138 acres in Adair County (Figure 13).



**Figure 12. Changes In Number of Farms and Average Farm Size In Oklahoma, 1935-1965**



**Figure 13. Average Farm Size By Counties, Oklahoma, 1959**



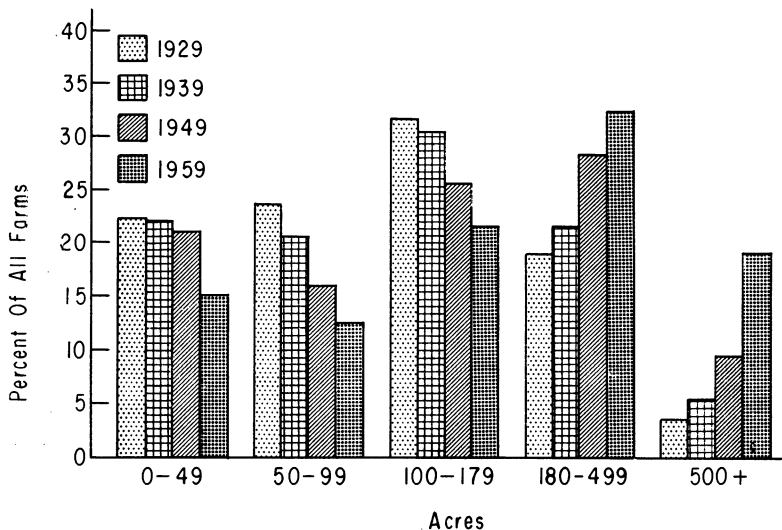
Figure 14 indicates the percentage of all Oklahoma farms in the various size classifications for the census years 1909-59. The percentage of farms in the first classification (0-49 acres) decreased from 22.2 percent in 1929 to 15.0 percent in 1959. Over the same period, the percentage of farms in the largest acreage classification (500 acres and over) increased from only 3.6 percent in 1929 to 18.9 percent in 1959.

### Farm Labor

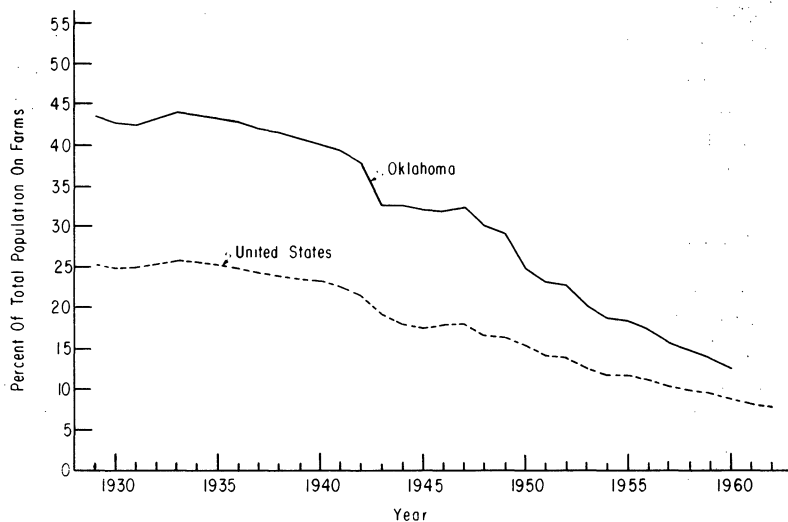
A reduction in farm labor requirements has attended the drop in farm numbers and increase in farm size described above. In 1929, 43.5 percent of Oklahoma's population lived on farms (Figure 15). By 1960, this figure declined to 12.6 percent. During the same period, the percentage of the total U. S. population living on farms declined from 25.2 percent to 8.7 percent.<sup>3</sup> The number of farm operators in Oklahoma declined from 203,866 in 1929 to 94,678 in 1959.

Large changes have taken place in farm tenure (Figure 16). Despite a drastic increase in per farm capital investment requirements, the percentage of Oklahoma farmers owning their farms (full-owners) increased from 26.3 percent in 1929 to 49.1 percent in 1959. The percentage of Oklahoma farmers having part-ownership in their farms likewise increased substantially—from 11.8 percent in 1929 to 31.6 percent in

<sup>3</sup> Available figures for 1962 show that this percentage has declined to 7.7 percent.



**Figure 14. Percentage of Farms in Various Acreage Classifications, Oklahoma, Census Years 1929, 1939, 1949, 1959**



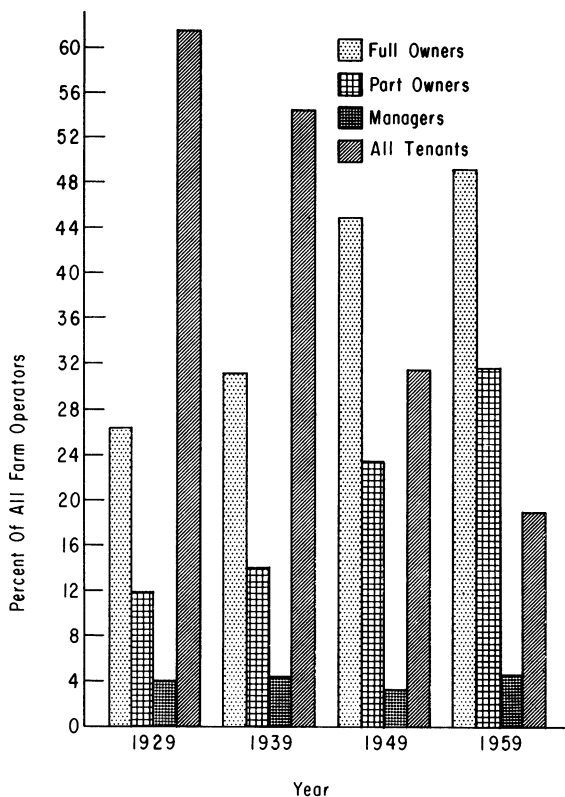
**Figure 15. Trends in Percentage of Total Population Living on Farms, United States and Oklahoma, 1929-1962**

1959. During the same 30-year period, the percentage of Oklahoma farmers classified as tenants decreased from 61.5 percent to 18.9 percent. The increased resident ownership of Oklahoma farms can be largely attributed to: (1) migration of people from low income tenant farms to better off-farm income opportunities and, (2) the increased pressures for farm owners to purchase more land to obtain a reasonable standard of living and achieve scale economies.

Part-time farming has increased in importance in Oklahoma during the last 30 years. From 1950 to 1959 the number of Oklahoma farms classified as part-time farms increased from 19,881 to 28,143. This represents an increase from 14 percent to 26 percent of the total number of farms in the state.

### **Farm Land and Buildings**

Investment in land and buildings on Oklahoma farms has increased sharply since 1929, both on a per farm basis and per acre of farmland. Capital per farm for land and buildings in Oklahoma increased from \$6,096 in 1929 to \$31,155 in 1959 (Figure 17). Of course, much of this increase in capital requirements was due to increases in farm size and the overall price level. On a per acre basis, investment in farmland and buildings increased from \$36.78 in 1929 to \$84.65 in 1959 (Figure 17).

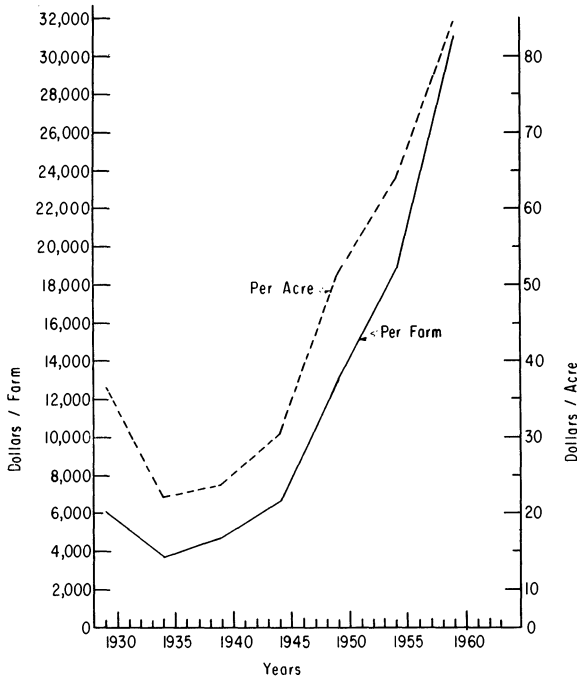


**Figure 16. Trends in Tenure of Farm Operators, Census Years, 1929-1959**

During the last 35 years, many acres of Oklahoma’s farmland have been diverted from cropland to pasture. In 1929, 20.6 million acres were used as cropland. In 1959, this figure had declined to 12.2 million acres—a decrease of 41 percent (Figure 18). During the same time period, pastureland increased from 14.6 million acres to 22.5 million acres.

**Farm Machinery**

Although there are no estimates available of capital invested in farm machinery by Oklahoma farmers in recent years, trends in the number of various types of farm equipment on Oklahoma farms gives some insight into the magnitude of the spectacular growth of machinery investments. Trends in truck and tractor numbers since 1929, grain combines since 1944 and pickup balers since 1949 are presented in Figure 19. The average number of trucks per farm increased from .12 to .98 between 1929 and 1959. During the same 30-year period, the average number of



**Figure 17. Changes in Value of Farmland and Buildings, Average Per Farm and Per Acre, Oklahoma, 1929-1959**

tractors per farm increased from only .13 to 1.15. In 1929, just over one out of ten Oklahoma farmers owned a tractor. In 1959, the average farmer owned more than one tractor.

**Production Expenses**

Figure 20, showing production costs for items obtained mainly from the nonfarm sector, tends to summarize trends discussed above. An upward trend in production expenses of Oklahoma farmers is apparent—especially since 1957. The trend partially is due to inflation as nonfarm firms supplying inputs raise prices to cover increasing factory labor and other costs. The trend also is upward because larger quantities of many items are being purchased.

For example, Oklahoma farmers used 141 thousand tons of fertilizer in 1949, but used 348 thousand tons in 1963 (Figure 21). Fertilizer prices remained nearly stable, and expenditures on fertilizers rose from 1.6 percent to 4.2 percent of total annual production expenses between 1949 and 1963. Greater use of profitable and productive cash

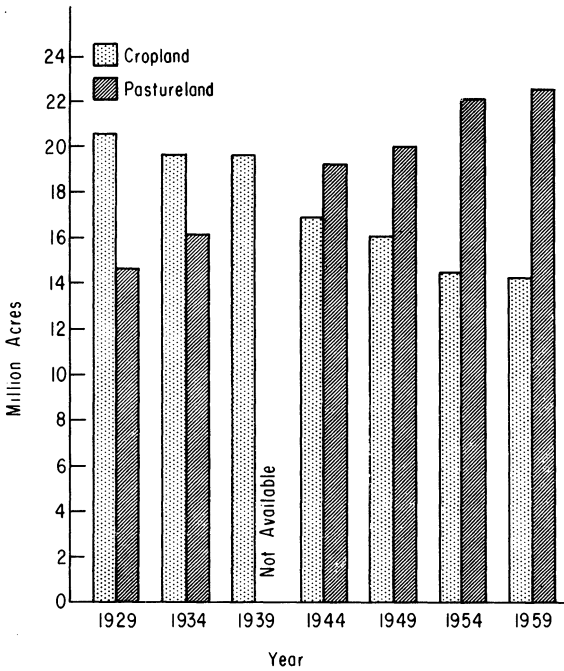


Figure 18. Trends in Land Use, Oklahoma, Census Years 1929-1959

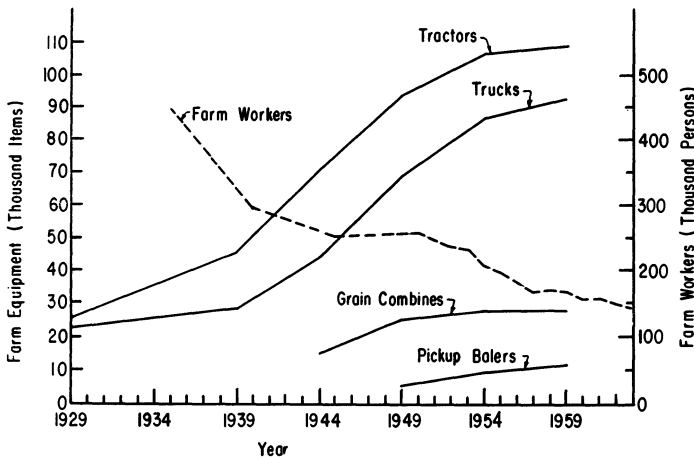


Figure 19. Trends in Number of Tractors, Trucks, Grain Combines, Pickup Balers and Farm Workers, Oklahoma, Census Years, 1929-1959 (\*Data not available for trucks and tractor in 1934)

inputs such as fertilizer require capital and take a sizeable share of gross farm receipts. But the net income to pay operator labor and equity capital costs (not shown in Figure 20) would be much lower if farmers did not use fertilizers and the latest technology and practices.

The major change in the input structure of Oklahoma agriculture is the substitution of cash operating inputs such as fertilizers, improved seed varieties, high protein feed and pesticides for operator labor, cropland and farm produced power.

### Efficiency

The changing input structure has contributed significantly to farming efficiency. The following data on yields and labor productivity reflect efficiency and contributions to economic growth. The changes in crop yields have been partly due to rapid expansion of irrigation and fertilization (Figure 21). Figures 22, 23 and 24 illustrate yield trends of major crops in Oklahoma since 1929. Although short-term conditions, mainly the weather, have had great effects on crop yields, the long-term trend has been strongly upward. This upward trend has been most pronounced since the mid-1950's. Other factors contributing significantly to the recent trend are pesticides and crop variety improvement with rapid adoption of these new varieties by Oklahoma farmers.

Figure 25 shows the changes in individual animal yields on Oklahoma farms. Since 1930, annual milk production per cow increased from 3,480 pounds to 6,300 pounds while annual egg production per hen increased from 80 eggs to 193 eggs. These increases are attributed to improved breeding, feeding, and managing of farm animals.

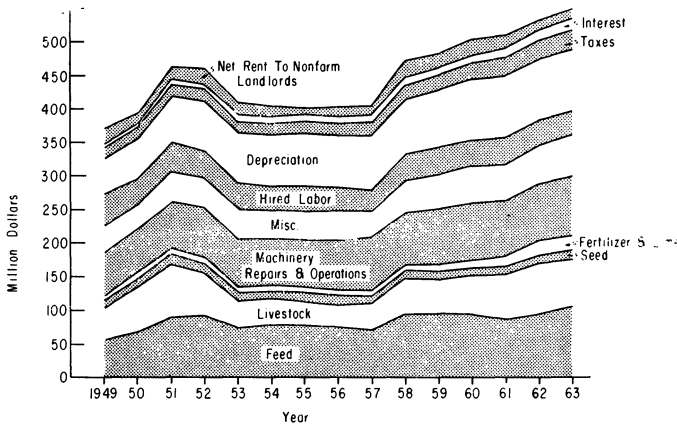
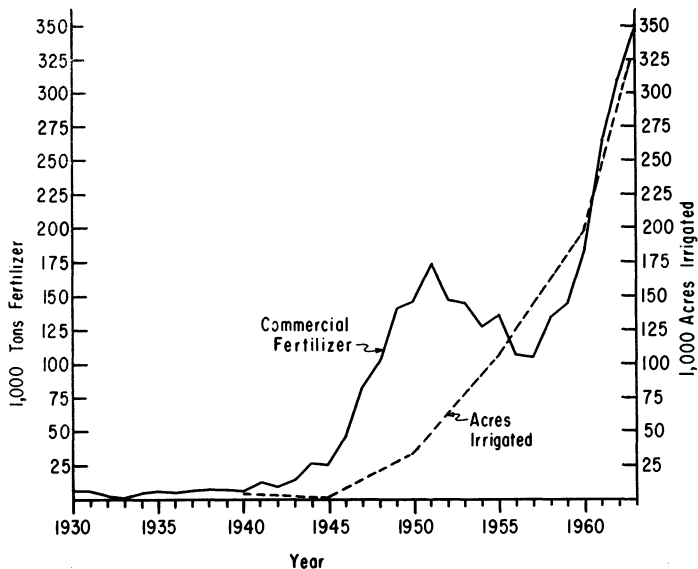
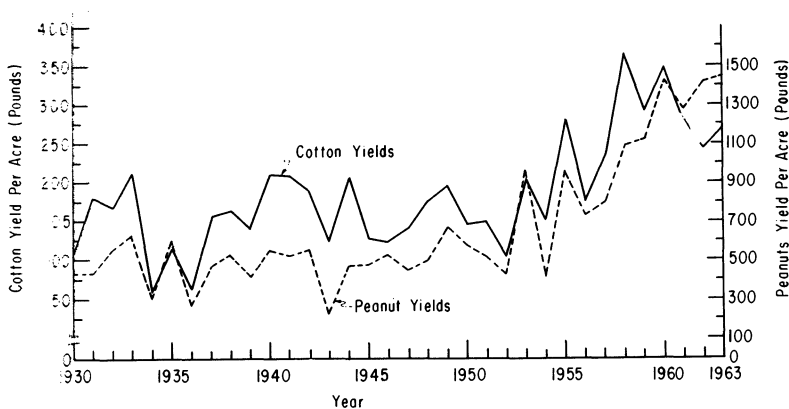


Figure 20. Trends in Oklahoma Farm Production Expenses, 1949-1963

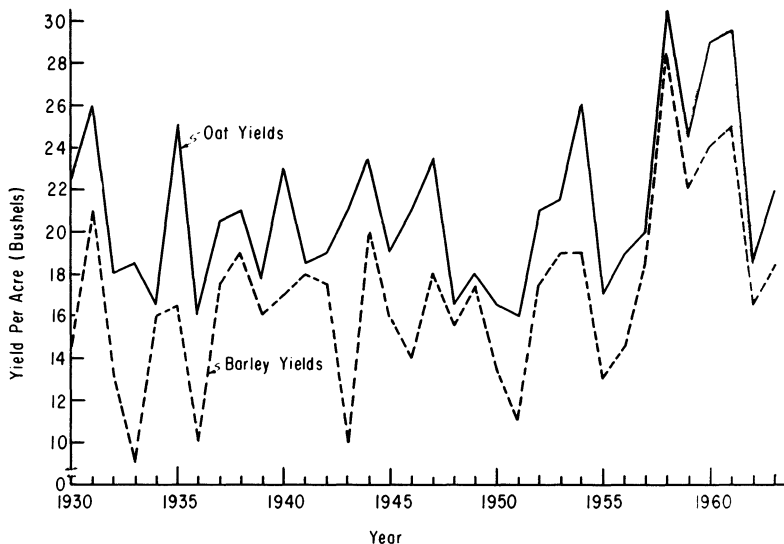


**Figure 21. Trends in Commercial Fertilizer Application and Irrigation on Oklahoma Farms, 1929-1964**

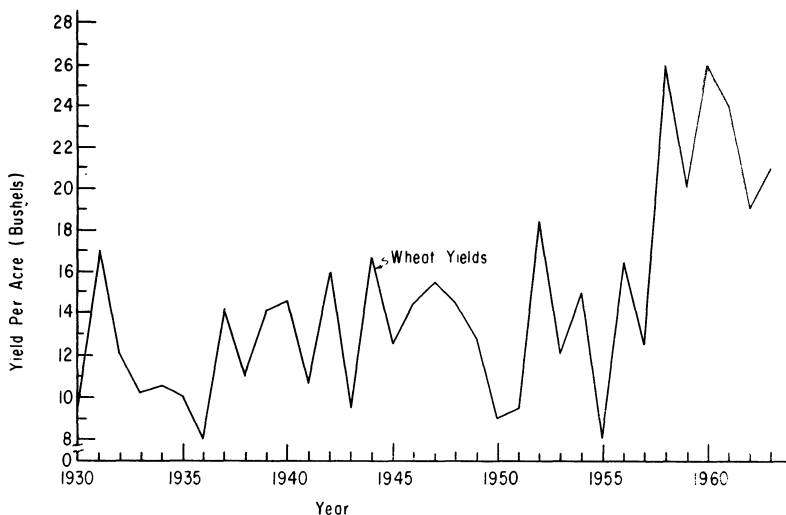


**Figure 22. Trends in Cotton and Peanut Yields Per Acre on Oklahoma Farms, 1930-1963**

Estimates of overall efficiency in Oklahoma agriculture are not available. However, efficiency estimates of U. S. agriculture and other major industries are shown in Figures 26-28. Trends in efficiency on U. S. farms are believed to be representative of changes in efficiency on Oklahoma farms. Labor efficiency (output per unit of labor) aver-



**Figure 23. Trends in Oat and Barley Yields Per Acre on Oklahoma Farms, 1930-1963**



**Figure 24. Trends in Wheat Yields Per Acre on Oklahoma Farms, 1930-1963**

aged 225 percent of the 1929 level on farms in 1962 (Figure 26). This was considerably higher than the increase in efficiency of all other industries which rose to 170 percent of the 1929 average by 1962. The trends were similar to 1948, then agriculture began to move ahead at a rapid pace.



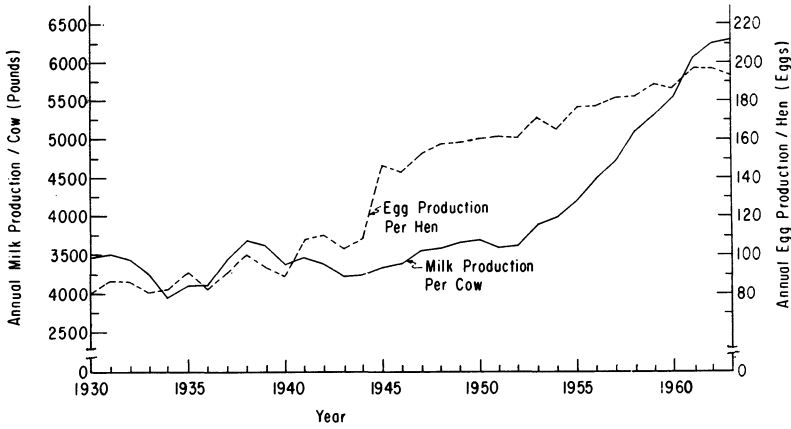


Figure 25. Trends in Annual Milk Production Per Cow and Egg Production Per Hen on Oklahoma Farms, 1930-1963

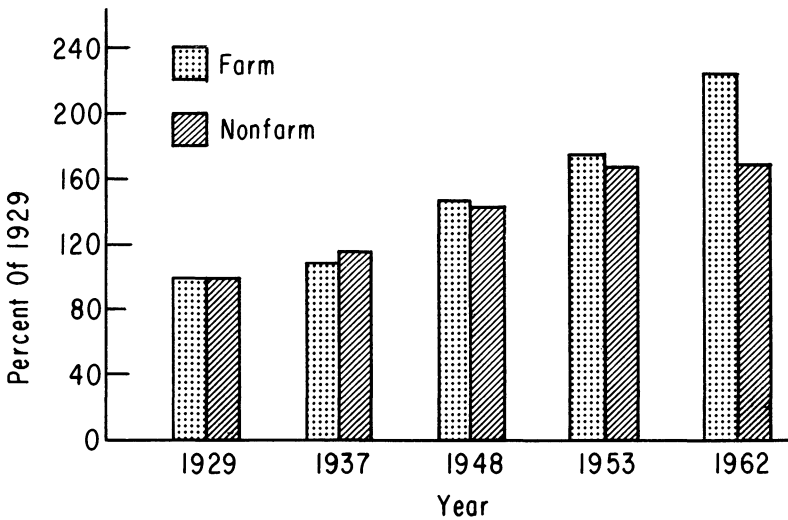


Figure 26. U. S. Farm and Nonfarm Labor Efficiency as a Percent of 1929

Agriculture does not come out so well in output per unit of capital, mainly because many farmers have perhaps been overzealous in machinery purchases (Figure 27). Figure 28 shows output per unit of labor and capital combined, and is the best measure of overall efficiency. Again agriculture comes out well, at least in the postwar period. It is above the average of all nonfarm industries in efficiency (Figure 28).

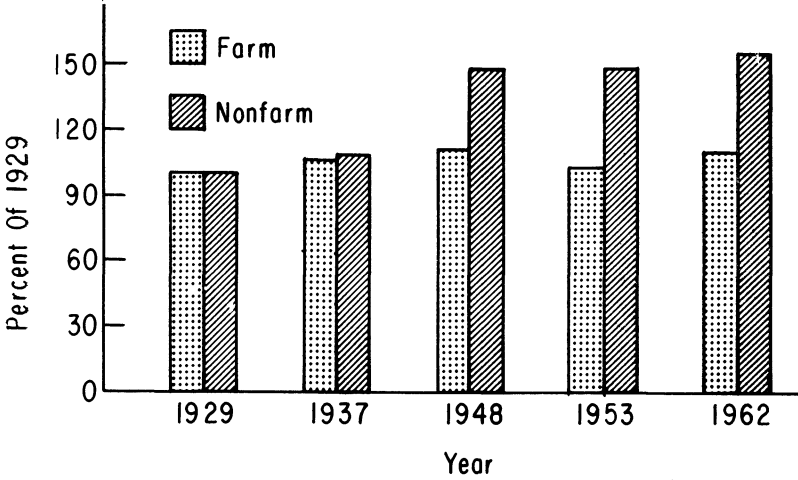


Figure 27. U. S. Farm and Nonfarm Capital Efficiency

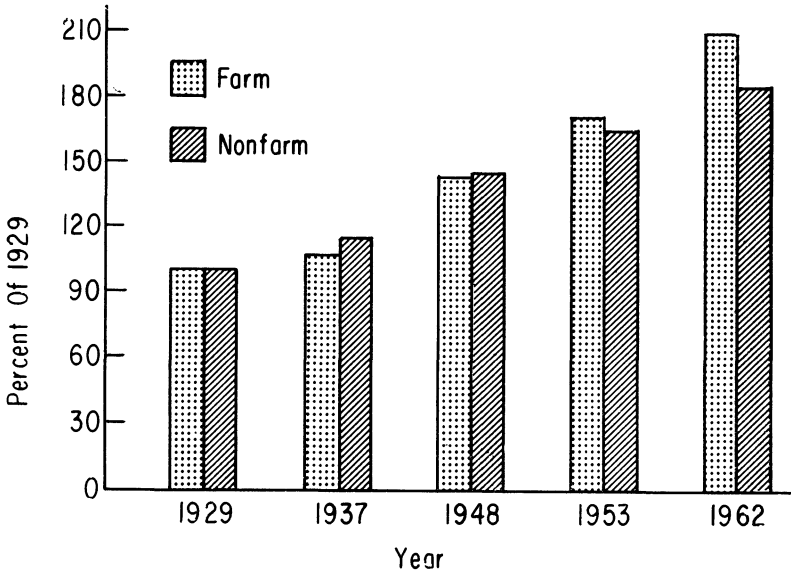


Figure 28. U. S. Farm and Nonfarm Efficiency of all Capital and Labor Inputs Combined

### CHANGES IN CROPS AND LIVESTOCK

During recent years, Oklahoma farmers have made large changes in farming enterprises. As was stated earlier, livestock and livestock products

have increased in relative importance as a source of farm income while income from crops has declined in relative importance. Within each of these two primary enterprise headings there also have been sizeable adjustments.

Major changes have been made in corn, cotton, hay, and wheat acreage since 1930 (Figure 29). Corn in Oklahoma declined from 3,230 thousand acres planted in 1929 to only 155 thousand acres in 1963. During the same period, cotton declined from 4,114 thousand acres to 620 thousand acres. Hay was produced on 965 thousand acres in 1929; 1,485 thousand acres in 1963. Wheat acreage increased from 4,868 thousand acres in 1929 to a high of 7,481 thousand acres in 1949. However, since 1949 wheat acreage in Oklahoma declined due to government acreage controls; and 4,740 thousand acres were planted in 1963.

The land planted to all the crops shown in Figure 29 declined from 15,856 thousand acres in 1929 to 9,664 thousand acres in 1963.<sup>4</sup>

Oklahoma farmers have also made large changes in their livestock enterprises (Figure 30). The number of all cattle and calves on Oklahoma farms increased from 1,814 thousand to 4,029 thousand head since 1929 while dairy cattle numbers have declined from 631 thousand to 226 thousand head. Hog numbers have declined from 1,215 thousand head in 1929 to only 314 thousand on January 1, 1964. Sheep numbers have been quite erratic since 1929, showing no definite upward or downward trend. The number of all chickens on Oklahoma farms was reduced from over 14 million in 1929 to only three million in 1964.

<sup>4</sup>These acreages of crops included in Figure 26 comprise about two-thirds of the total crop acres as listed in the *Census of Agriculture* for both 1929 and 1959.

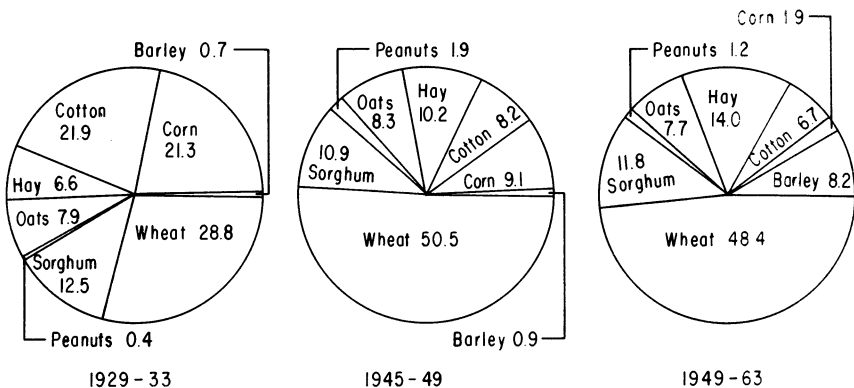
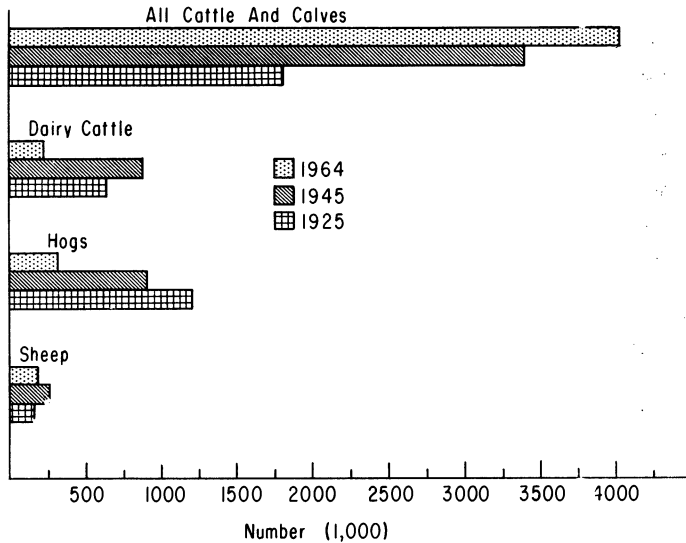


Figure 29. Relative Importance of Major Crops In Oklahoma, Selected Acreage of Total Cropland (Percent)



**Figure 30. Changes in Livestock Numbers on Oklahoma Farms, 1929-1964**

Turkey numbers increased up to 1940, when a high of 411 thousand was reached. The number declined to 79 thousand on January 1, 1964. Table 2 contains estimates of the value of all livestock on farms in Oklahoma.

## CHANGES IN OKLAHOMA'S POSITION IN U. S. AGRICULTURE

What is the competitive position of Oklahoma agriculture? This section answers this question by examining the trends in Oklahoma income compared to U. S. income from each of the six principal Oklahoma commodities for 1949-1963.<sup>5</sup> These annual comparisons are based on the 1957-1959 value of the dollar. That is, the value of a dollar over the 15-year period is adjusted to have the same purchasing power as in the 1957-1959 period. These annual constant dollar values are shown graphically as percentages of 1949 values.

Cash farm receipts from crops, livestock and government payments (on a current dollar basis) in Oklahoma increased from 613 million dollars in 1949 to 712 million dollars in 1963—a 16 percent increase. The purchasing power of each dollar received by farmers fell approxi-

<sup>5</sup> Inadequate data preclude detailed income comparisons before 1949. These commodities as shown in Figure 9 in order of their relative importance as sources of Oklahoma income in 1963 were cattle and calves, wheat, dairy products, cotton, poultry and eggs, and hogs.

**Table 2. Value of Livestock and Poultry on Farms, Oklahoma, 1929-1964.**

Year	All Cattle and Calves 1,000 Dollars	Milk Cows and Heifers 1,000 Dollars	Hogs and Pigs 1,000 Dollars	Lambs and Sheep 1,000 Dollars	Chickens 1,000 Dollars	Turkeys	Total Investment in Livestock and Poultry
1929	81,630	40,384	11,664	1,584	11,370	678	147,310
1930	78,515	38,350	9,898	1,646	11,055	564	140,028
1931	51,308	24,300	7,509	842	7,312	378	91,649
1932	41,360	19,710	6,025	555	6,281	464	74,395
1933	34,827	15,560	4,518	508	4,140	290	59,843
1934	30,450	13,408	3,268	592	3,241	250	51,209
1935	33,526	14,364	3,139	1,257	3,853	368	56,507
1936	55,514	23,746	9,336	1,414	5,991	564	96,565
1937	48,622	21,840	5,756	1,357	4,458	382	82,415
1938	56,808	26,566	6,059	2,138	5,579	515	97,665
1939	67,080	30,828	7,880	1,935	5,728	644	114,095
1940	73,707	31,836	6,002	2,036	4,885	575	119,041
1941	84,205	35,820	5,194	2,037	5,268	526	133,050
1942	117,346	47,712	12,098	2,881	8,989	644	189,670
1943	170,415	66,576	22,996	3,237	13,940	677	277,841
1944	144,145	55,632	13,202	2,080	16,247	708	232,014
1945	161,910	61,950	13,711	2,032	14,568	583	254,754
1946	158,258	60,236	15,488	1,912	14,692	562	251,148
1947	195,038	71,136	17,690	2,465	12,426	473	299,228
1948	236,817	82,708	22,339	2,181	12,076	359	356,480
1949	282,834	92,400	21,142	1,874	12,192	483	410,925
1950	268,320	84,600	13,788	2,162	9,879	387	379,136
1951	409,542	108,870	18,822	3,366	9,182	419	550,201
1952	485,444	107,952	14,810	3,931	9,215	448	621,800
1953	314,959	67,728	7,531	2,118	6,454	318	399,108
1954	247,456	53,130	8,384	2,808	6,306	285	318,369
1955	216,282	43,148	8,243	2,969	4,302	322	275,266
1956	229,658	44,835	6,389	3,310	5,014	326	289,532
1957	209,947	41,265	6,816	3,063	4,972	396	266,459
1958	312,984	51,100	8,224	3,761	4,477	412	380,958
1959	456,814	60,420	11,322	4,459	4,803	426	538,244
1960	401,982	49,130	6,508	3,629	3,414	339	465,002
1961	407,508	46,200	7,999	3,826	3,246	558	469,337
1962	464,058	45,408	8,988	2,772	2,959	304	524,489
1963	494,973	41,553	9,134	2,701	2,665	300	551,326
1964	447,219	33,674	5,558	2,261	2,510	292	491,514

Source: U. S. Department of Agriculture, Bureau of Agricultural Economics, *Livestock and Poultry on Farms and Ranches on January 1*, Statistical Bulletin 88 (Washington, 1950); U. S. Department of Agriculture, AMS, *Livestock and Poultry Inventory, January 1*, Statistical Bulletin No. 177 (Washington, June, 1956); U. S. Department of Agriculture, AMS, Statistical Bulletin No. 278 (Washington, February, 1961); and U. S. Department of Agriculture, SRS, *Livestock and Poultry Inventory, January 1*, Annual Issues.

mately 25 percent.<sup>6</sup> Thus total real income (measured by the consumption and production items that could be bought by Oklahoma farmers from crop and livestock receipts and from government payments) fell approximately nine percent between 1949 and 1963. Prices received for crops and livestock increased only two percent over the period. Oklahoma farmers increased efficiency and maintained the same physical volume of output in 1963 as in 1949 with less land and labor. But prices they paid increased faster than prices they received, putting a squeeze

<sup>6</sup> Deflating by prices paid by farmers as above or the wholesale price index used later in the graphs gives essentially the same result.

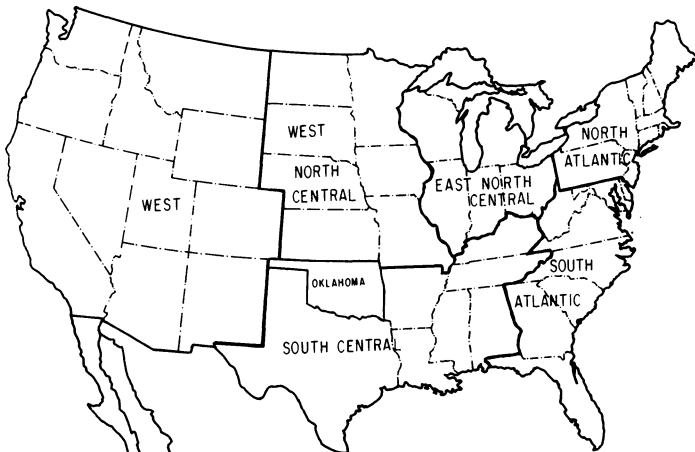
on income. This squeeze encouraged some of the enterprise adjustments described below.

To gain an insight into the regional changes in production of the six major Oklahoma farm commodities, charts were prepared to show the relative regional shares of national income accruing from these products for selected years. Except in the case of wheat, these selected years are reasonably representative of changes occurring in the 1949-63 period. These regions are outlined in Figure 31.

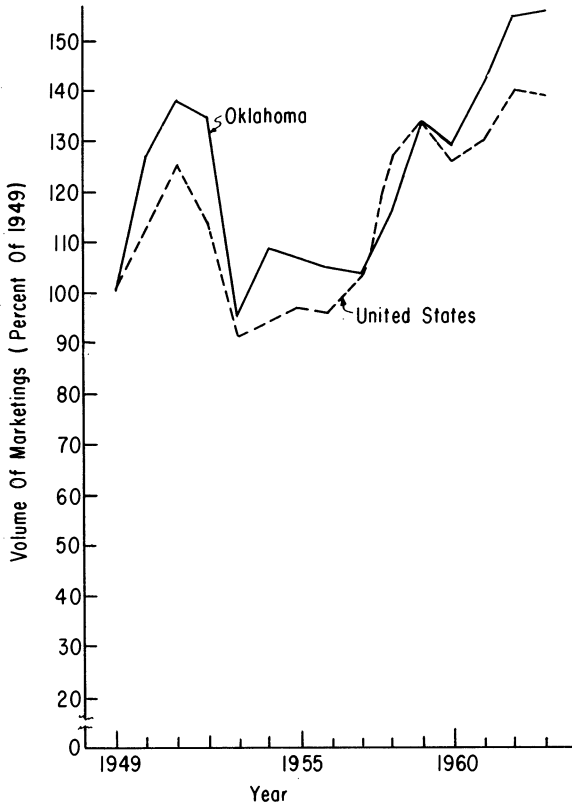
### **Cattle and Calves**

The constant dollar volume of calf and calf marketings in Oklahoma increased 56 percent during the period 1949-1963 while U. S. cattle marketing increased by 39 percent (Figure 32). The increased marketing of beef in the U. S. was made possible by changing tastes and higher income reflected in increased per capita consumption. Since 1949, U. S. annual per capita consumption of beef has increased 48.8 percent (from 63.9 to 95.1 pounds).

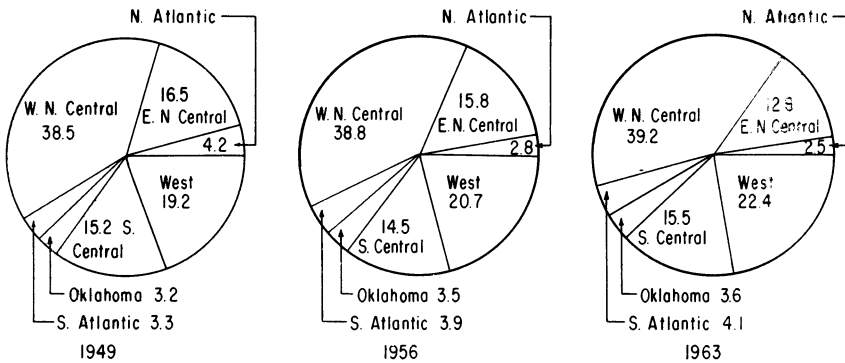
Oklahoma farmers' share of cattle and calf marketings increased from 3.2 percent to 3.6 percent during the 15-year period (Figure 33). Regional shifts in beef production have been slight, with some movement from the East North Central and North Atlantic regions and toward the South Atlantic and Western regions. Some reasons for the relatively greater share of cattle and calf marketings in Oklahoma and other Southern regions include improved grasses such as Bermuda that respond to management on soils previously in crops and mild climate.



**Figure 31. Agricultural Regions of the U. S.**



**Figure 32. Changes in Value of Cattle and Calf Marketings, Oklahoma and United States, 1949-1963, Constant Dollars as a Percent of 1949 (Deflated by Wholesale Price Index)**



**Figure 33. Regional Shares of U. S. Income From Cattle and Calf Marketings, 1949-1963 (Percent)**

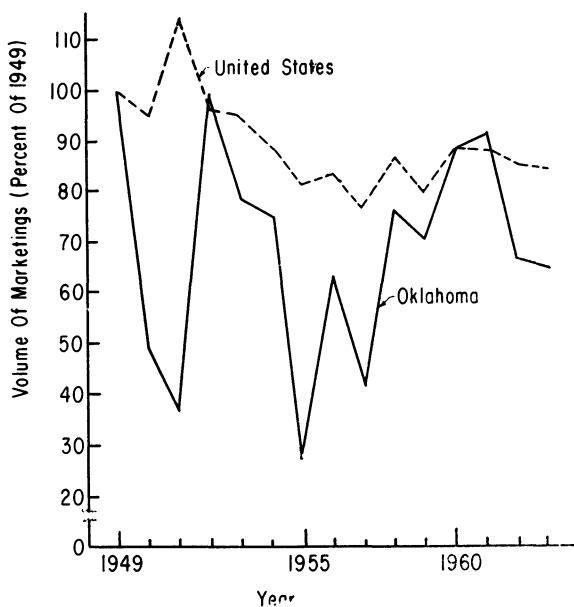
## Wheat

The volume of wheat marketings in Oklahoma and the U. S. has declined since 1949, due mainly to allotments. U. S. constant dollar wheat marketings in 1963 were 84 percent of the 1949 level, while 1963 Oklahoma marketings comprised only 65 percent of 1949 marketings (Figure 34).<sup>7</sup>

During the 15-year period, 1949-1963, Oklahoma declined slightly relative to the U. S. in income from wheat. The State's share of U. S. income from wheat fell from 7.7 percent in 1949 to 6.6 percent in 1963 (Figure 35). But, as Figure 34 readily points out, these percentage changes depend upon the year chosen since annual income from wheat in Oklahoma has been rather erratic since 1949. As recently as 1961, Oklahoma marketed a larger percent of the U. S. wheat than it did in 1949.

The major regional shifts of U. S. farm income from wheat has been toward the West North Central region whose relative share increased from 37.7 to 45.5 percent during the 15-year period (Figure 35). The

<sup>7</sup> U. S. and Oklahoma wheat acreages declined 21.9 percent and 21.6 percent, respectively, from the 1940's to 1960-1963.



**Figure 34. Changes in the Value of Wheat Marketings, Oklahoma and the United States, 1949-1963, Constant Dollars as a Percent of 1949 (Deflated by Wholesale Price Index)**



data give no support for the commonly held view that much wheat production has shifted east of the Mississippi River since allotments were placed on wheat in the 1950's. The combined income from wheat in the four eastern regions (from the two Atlantic regions, the East North Central region and South Central region) relative to U. S. wheat income decreased from 31.3 percent in 1949 to 30.7 percent in 1963. The West has remained relatively stable in its portion of U. S. wheat income.

### Dairy Products

The sale of dairy products ranked third among enterprises as a source of income to Oklahoma farmers in 1963. But Oklahoma's income from dairy products on a constant dollar basis declined 18 percent from 1949 while U. S. marketings were up seven percent (Figure 36). The increase in U. S. marketings has been caused by increased consumer demands brought about largely by population growth. The relative decline in Oklahoma dairy production was due to farmers' attitudes concerning milk production versus production of other less labor-intensive farm commodities, uncertainty of roughage production and lack of markets for butterfat. Milk sold as cream decreased from 612 million pounds in 1949 to only 90 million pounds in 1963, whereas fluid milk sales increased from 720 million pounds to 1,120 million pounds in the same period.

Oklahoma accounted for only 1.1 percent of the nation's income from dairy products in 1963 as compared to 1.4 percent in 1949 (Figure 37). Regional shifts in U. S. dairy production since 1949 include increased production in the South Atlantic region and a slight relative decrease in the East North Central.

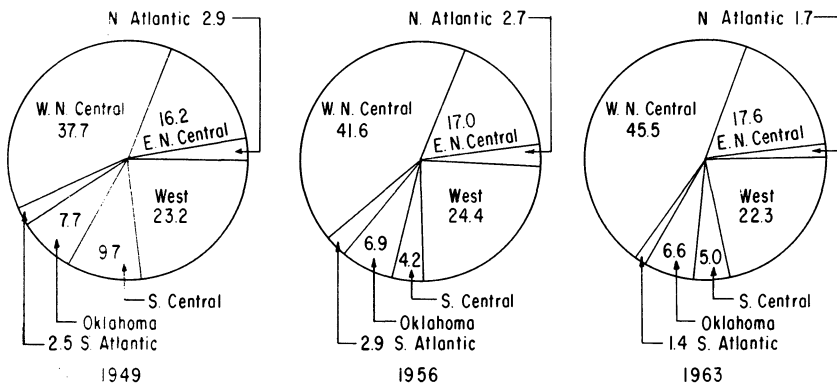
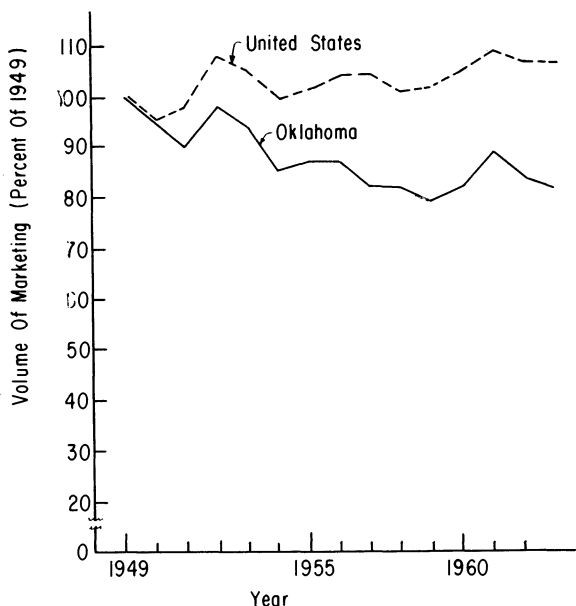
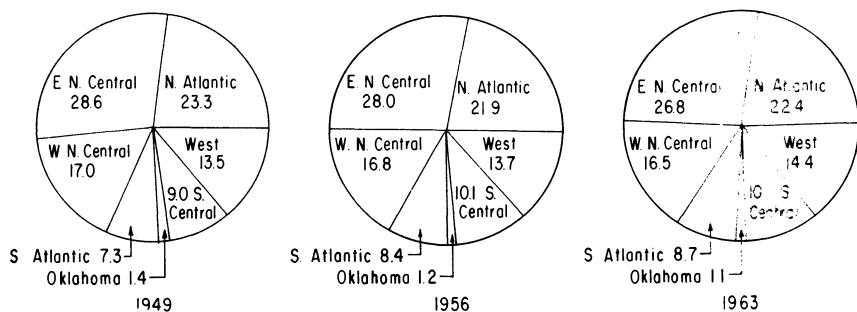


Figure 35. Regional Shares of U. S. Income From Wheat, 1949-1963 (Percent)



**Figure 36. Changes In the Value of Dairy Products Marketed, Oklahoma and the United States, 1949-1963, Constant Dollars as a Percent of 1949 (Deflated by the Wholesale Price Index)**



**Figure 37. Regional Share of U. S. Income From Dairy Products, 1949-1963 (Percent)**

**Cotton**

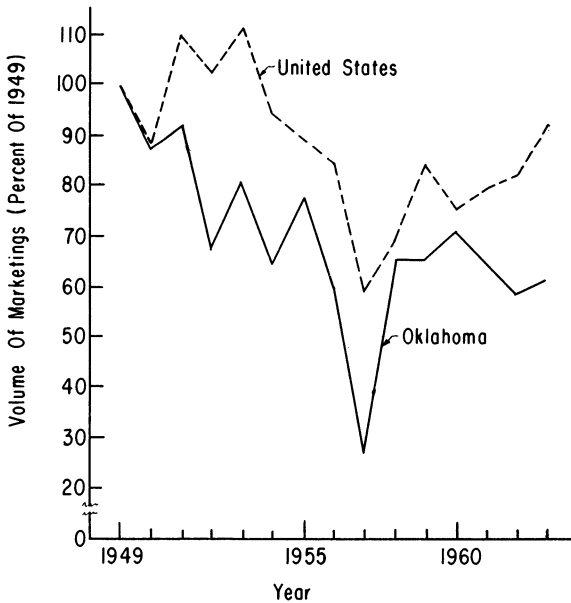
Cotton production has declined drastically as a source of Oklahoma farm income in recent years (see Figure 9). The boll weevil, lower prices (from competition with synthetic fibers and increased cotton production in irrigated areas of the west), and a realization that many soils especially in eastern areas of the State were unsuited to sustained cotton produc-

tion—all contributed to the demise of cotton. Average annual acres planted to cotton in Oklahoma declined from 1.46 million acres during 1940-1949 to only .66 million acres in 1960-1963—a 56 percent decrease. At the same time, U. S. cotton acreage declined 28 percent. Constant dollar sales of cotton in the U. S. and Oklahoma declined eight percent and 39 percent, respectively, from 1949 to 1963 (Figure 38).

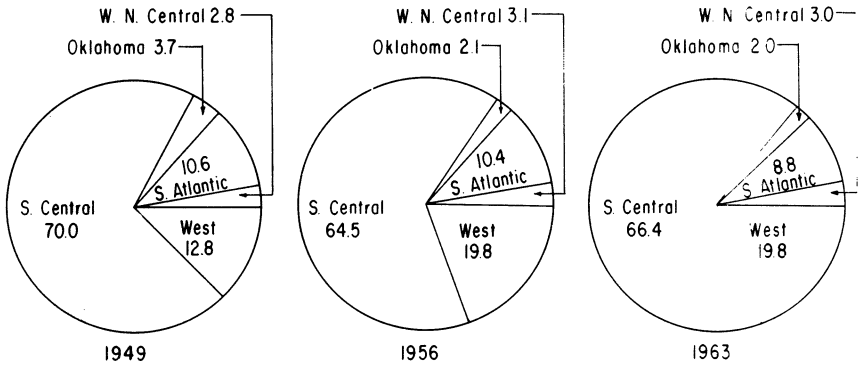
The regional changes in the share of income from cotton since 1949, depicted in Figure 39, indicate relatively large decreases in Oklahoma, the South Central and South Atlantic regions and a substantial increase in the Western region. The Mississippi Delta, High Plains of Texas and other areas in the South Central region remain dominant in cotton production, however. The West's one-fifth share of cotton income remained the same in 1956 and 1963.

### **Poultry and Eggs**

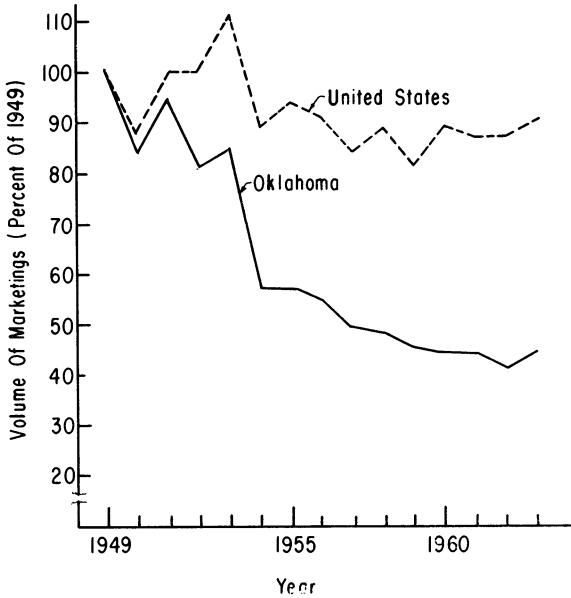
From 1929 to 1963, income from poultry and eggs declined as a percent of total Oklahoma farm income from 8.5 percent to only 3.3 percent (Figure 9). Figure 40 shows that on a constant dollar basis, income



**Figure 38. Changes In the Value of Cotton Marketings, Oklahoma and the United States, 1949-1963, Constant Dollars as a Percent of 1949 (Deflated by the Wholesale Price Index)**



**Figure 39. Regional Shares of U. S. Income From Cotton, 1949-1963 (Percent)**



**Figure 40. Changes In the Value of Poultry Products Marketed, Oklahoma and the United States, 1949-1963, Constant Dollars as a Percent of 1949 (Deflated by the Wholesale Index)**

from poultry products in Oklahoma declined 56 percent from 1949 to 1963. Over the same period, U. S. income from poultry products declined only by 10 percent. Since 1949, Oklahoma's income from poultry and eggs declined as a proportion of the U. S. share from 1.5 percent to only .7 percent.

There has been drastic shifts among regions in production during the last 15 years (Figure 41). In general, U. S. poultry production has shifted from northern to southern regions due to vertical integration, favorable climate and cheap labor. Poultry income from the South Atlantic region as a proportion of the U. S. total increased from 13.4 percent to 25.1 percent. Meanwhile poultry income from the South Central region increased from 11.5 percent to 23.0 percent of the U. S. total. Income from poultry production in the North Central region and the North Atlantic region declined substantially as a percent of total U. S. poultry income during the period.

### Hogs

As shown in Figure 9, hogs declined in importance as a source of farm income in Oklahoma since 1929. Since 1949, marketings of hogs by Oklahoma farmers fell 56 percent while U. S. marketings declined only 19 percent (Figure 42). Reasons for the marked reduction in the State's hog production are not known with certainty. Undoubtedly part is explained by personal preferences by farmers for cattle, by the competitive advantage of the Corn Belt in feed grain production made possible by improved corn hybrids, fertilizers and continuous cropping; and by the trend toward cattle feeding rather than hog feeding as new grain sorghum hybrids tend to restore some of the lost competitive advantage to Oklahoma.

U. S. hog production since 1949 has tended to become more concentrated in the North Central regions (Figure 43). Income from hogs in the two North Central regions comprised 79 percent of U. S. income

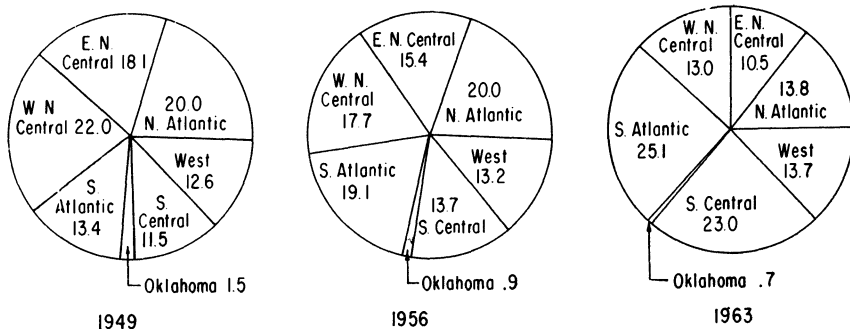
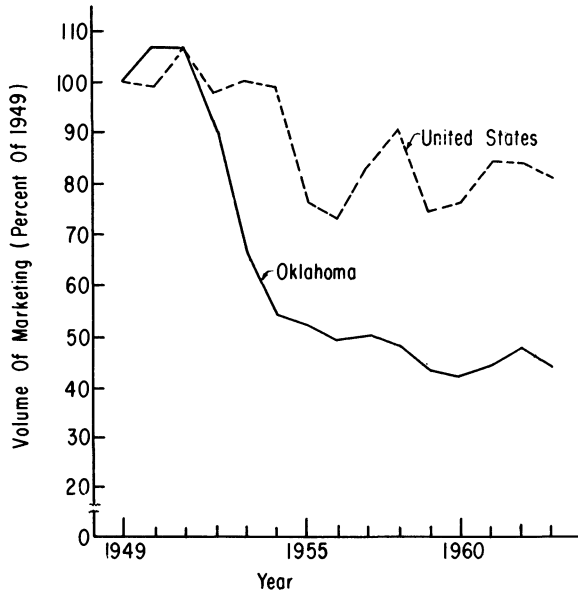
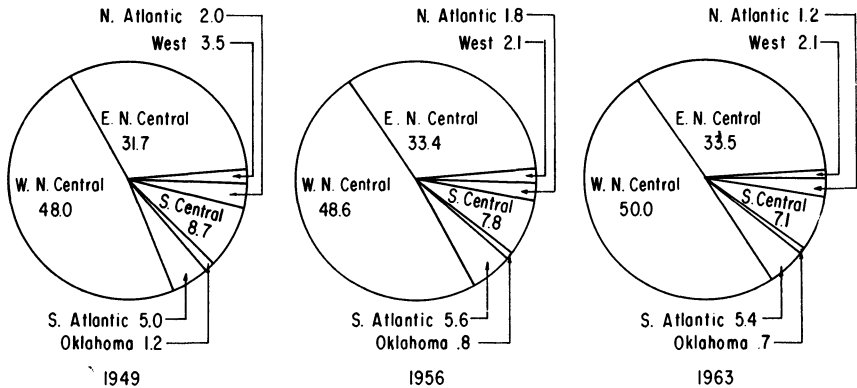


Figure 41. Regional Shares of U. S. Income from Poultry and Eggs, 1949-1963 (Percent)



**Figure 42. Changes In the Value of Hog Marketings, Oklahoma and the United States, 1949-1963, Constant Dollars as a Percent of 1949 (Deflated by the Wholesale Price Index)**



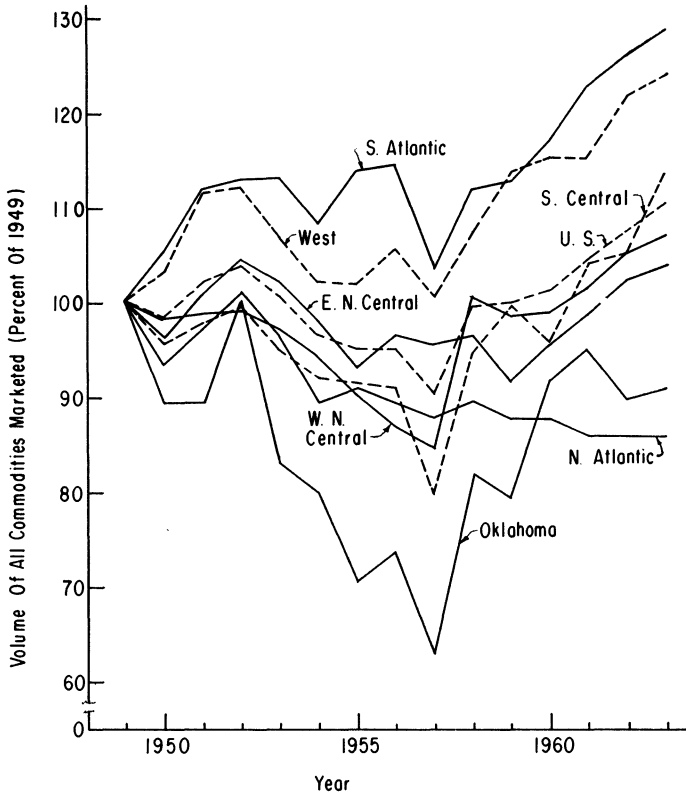
**Figure 43. Regional Shares of U. S. Income from Hogs, 1949-1963 (Percent)**

from hog marketings in 1949. By 1963, this figure had increased to 83.5 percent. The increased concentration in these regions has been accompanied by declining significance of the North Atlantic, South Central, and Western regions in hog production.

## SUMMARY OF REGIONAL SHIFTS OF INCOME FROM ALL FARM PRODUCTS, 1949-1963

Figure 44 summarizes the percentage changes in constant dollar income from all farm products for Oklahoma, the various regions and the United States since 1949. While real income from all farm products marketed in the U. S. increased by 10.5 percent from 1949 to 1963, Oklahoma's income declined nine percent. Thus, Oklahoma's share of total U. S. farm income has fallen since 1949. While Oklahoma marketings of cattle and calves increased substantially (56 percent) since 1949, this increase has not offset the downtrend in marketings of other Oklahoma farm products. Of the six major Oklahoma farm products, only cattle and calves kept pace with the 1949 volume of marketings. The switch from more intensive types of agriculture (crops, poultry, etc.) to a more extensive agriculture (cattle and calves) and generally low cattle prices since the early 1950's is associated with the tendency for Oklahoma's share of national farm income to decline. The return to labor, land and other fixed resources often is increased by the shift to less intensive enterprises despite the fall in gross income. It appears that the soil and climate of the State provide a competitive advantage over other areas in less intensive enterprises. But many questions remain unanswered and need further investigation.

Since 1949, there has been substantial variation among regions in constant dollar marketings (Figure 44). All the major regions have gained in marketing volume of farm products except the North Atlantic where marketings declined 14 percent from 1949-1963. The largest percentage increase was in the South Atlantic and Western regions where marketings of farm products increased by 29 percent and 24 percent, respectively. The declining share of the North Atlantic region in U. S. agricultural production has been due to substantial increases in urban land use and competition from other areas with more adequate farm resources and fewer nonfarm employment alternatives. The increased importance of the South Atlantic region has been due to movement toward more intensive enterprises such as poultry made possible by cheap labor and climate. Increased irrigation, and other capital investment; and intensification in livestock feeding, vegetables and fruits in an environment of growing local markets made possible the great expansion of agricultural production in the West.



**Figure 44. Regional Changes In the Value of All Farm Commodities Marketed, 1949-1963, Constant Dollar as a Percent of 1949. (Deflated by Wholesale Price Index)**