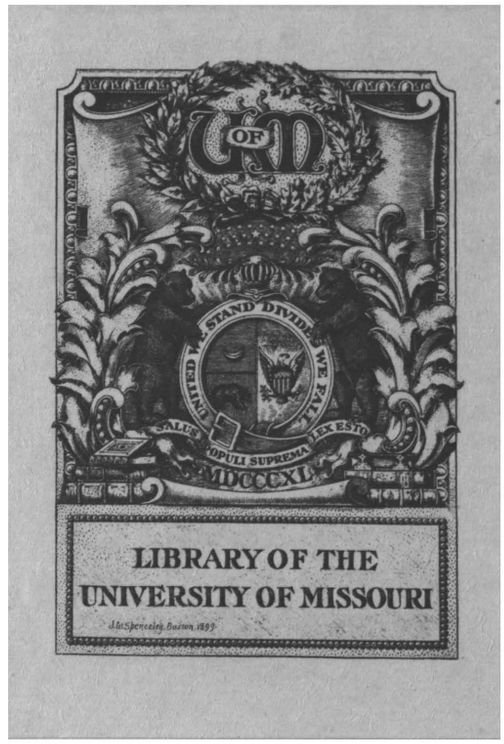

A STUDY OF TYPES OF FARMING IN THE U.S. BY THE FARM MANAGEMENT SURVEY METHOD.

BY

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CONTENTS

INTRODUCTION

The following study was made to get an insight into the conditions and farm practices of six different types of farming in the United States from the standpoint of farm management. Previous work along this line indicates that an investigation of the farm organization and administration now practiced on the best types of farms in the United States may not only be very interesting and instructive to the individual, but may contribute some knowledge of real and practical value to this branch of Agricultural science. This study was made from the 1910 Census. The object sought in this investigation in farm management is to secure the elementary facts which must be utilized in organizing and conducting the business of the farm in such a way as to give the maximum of products, profits, and enjoyment to the owner and to the farm family; to supply farm products in the best way to all who need them, and gradually to increase the productivity of the soil.

The main purposes in studying farm management are to gain power to analyze the business; to devise suitable systems of cropping, to make economical arrangements of fields, correct adjustments of field crops to live-stock; to utilize capital and labor to the best advantage; to decide upon suitable plans for keeping simple records of the leading projects on the farm; and to carry forward year by year, and day by day, the management of the farm and the work of farming in such a manner as

to give the largest product and the greatest profit per acre and per worker, and decade by decade to increase the productivity of the soil.

The business side of farming is coming into its own; it is an old principle made new and workable by study, investigation and application. Specialists have for years pursued certain lines of agricultural education and have gained a vast fund of information about the treatment of the soil, the culture of crops and the care of animals. This information is of use to the farmer only when it can be applied to the management of the farm.

It is important that the old soil robbing types of farming be superseded by more conservative methods; that the land be so tilled that it will bring the largest crops at the least expense of soil fertility; and that these crops be used or fed as near as possible on the land upon which they were grown, the manures and crop residues being returned to the soil. It is important also that the farmer receive a fair compensation for his labor. Crops must be selected that pay the best profits. These will differ in different years and localities. The farmer, therefore, must learn to select wisely and manage well so as to make a reasonable profit on his labor and investment.

The business of farming is constantly becoming more complex. The keen demand for land, the scarcity of labor, the desire for financial gain and the call of the city residents for supplies are acting as a spur for still greater effort. To meet these demands a new science is being developed which aims to correlate

the various factors entering into the farmer's business so that it will be more certain and remunerative. An effort is being made to organize the business of farming so that it may provide for the needs of the present generation without exhausting the source of supplies for generations yet to come. This new science is called Farm Management.

It is the purpose of this study to find out what methods of farm organization and management are the most successful relative to the six different types of farming. The farm manager is the one who plans the farm, arranges the cropping scheme, provides the equipment and actually transacts the business and sees to the operation of the farm. Because of the close relation of farm management to soils, farm crops, live-stock and other agricultural subjects, people often confuse the terms and gain erroneous ideas of what farm management really is.

Farm Management investigation should be emphasized, while experiment stations, both State and National, should continue to investigate plant, animal, and soil questions with a view to discovering ways of still further increasing production; yet it is highly important that attention be strongly focused on the discovery of the fundamental principles of farm management which determines whether or not a farm is successfully operated financially. Previous investigations and studies seem to indicate that there are certain definite factors which have an important relation to the successful operation of farms. These are:- size of business as measured

by area, capital invested or labor used, kind and quality of live-stock, crop yields, and production per animal.

Record-keeping, cost-accounting and trial balances or at least inventory estimates, are as important in the farmer's business as in the merchants business so far as understanding his business needs is concerned.

The early orchard and farm surveys made by Cornell University and the cost of production studies and the rural statistical work undertaken by the Minnesota Experiment Station in 1902 in co-operation with the Bureau of Statistics of the United States Department of Agriculture, have opened up the way for extensive investigation of farm economics in which the United States Department of Agriculture is rightly playing a leading part with many of the State experiment stations, following up numerous more or less localized problems. Farm economics and sound business principles are as necessary in successfully operating a farm, as in conducting any other business.

The farming business is the greatest industry in the world; and truly, a business so enormous as to yield an income of approximately ten billion dollars per year, is amenable to organization and administration, if the true economic principles underlying that business can but be determined. It is true that during the past decade some advance had been made in discovering these principles, but we are as yet only on the threshold of the investigation of farm management and business methods which underlie the business of farming.

There has been very little research and investigation in farm management compared to the other sciences of agriculture. No attempt has previously been made at the University of Missouri to study the types of farming in the United States, by the Farm Management Survey method. The writer has endeavored to set forth some of the factors which influence the success or failure of farmers, such as the proper amount and distribution of capital, size of the business, handling of live-stock, crop yields and their relation to the farmer's income. Executive ability and the proper adjustment of cog to cog in the business venture count for more than soil fertility or intelligent crop management. To market a product advantageously is as essential as to produce it economically. In short, business methods are as important as production methods, and far more likely to be neglected.

METHOD OF GATHERING DATA.

The data for this study were obtained from the 1910 census. This study includes six different types of farming in the United States; namely the corn-belt type of farming in Illinois; diversified farming in Missouri; live-stock farming in Iowa; wheat farming in Kansas; fruit farming in California and cotton farming in Alabama. Ten counties were included in the study of each type of farming, covering in all, sixty counties. The figures for the entire county were reduced to the average farm per county. Sixty farm management survey sheets were filled out and each survey sheet contains the farm management data for the average farm for that particular county. The census figures for Atchison County Missouri are given to illustrate the method of securing the necessary data.
The census gives the figures for the entire county and these must be reduced to the average farm per county. This is done by dividing the census figures by the total number of farms in that county (1679 number of farms.)

Capital

Census Figures for Entire County (Atchison).		Average Figures per Farm for Atchison County.
Real Estate	Land - $30,154,587	$17938.
	Buildings $3,354,395	$2020.
Live-stock - - -	$4.287,321	$2561.
Machinery & Tools	$ 652,243	$391.
Totals - - - - -	$59,189,951	$22900.

Crops

Kind	Acres	Total yield	Acres	Total yield	Value of those salable	Value of those feedable
		Bushels		Bushels		
Corn	142,246	4,909,150	85.3	2940		$1293.60
Potatoes	775	77,454	.46	46.4		32.48
Wheat	7,670	125,946	4.6	75.4	$64.84	
Oats	15,808	347,022	9.45	240		74.40
		Tons		Tons		
Tame hay	25,610	39,060	15.3	24.2		223.85
Clover & Timothy mixed	13,283	18,048	7.9	10.8		97.20
Alfalfa	2,646	7,427	1.58	4.45		46.72
Clover	2,943	3,579	1.76	2.14		19.26
Timothy	6,625	9,796	3.96	5.87		54.29
Prairie grass	2,843	4,772	1.7	2.85		
Receipts from sale of feedable crops - -		$508,570			$305.	
Estimated corn stalks at $.75 per acre, oatsstraw at $3.00 per ton and rental on pasture land 4% on investment						83.65
					$369.84	$1935.45

This table is read in this way; -$30,154,587 value of total land in Atchison County divided by 1679 the total number of farms in that county, gives the value of land per farm $17,938. Each figure is secured in like manner.

Live-stock.

Census figures for entire County (Atchison).		Average figures per farm for Atchison County.	
Kinds	Number	Kinds	Number.
Dairy cows	6,048	Dairy cows	3.6
Yearling heifers	2,487	Yearling heifers	1.48
Calves	2,320	Calves	1.39
Yearling bulls	2,788	Yearling bulls	1.6
Steers	17,338	Steers	10.4
Other cows	3,024	Other cows	1.8
Yearling horses	1,010	Yearling horses	.59
Horse colts	,451	Horse colts	.27
Mature horses	9,731	Mature horses	5.8
Mature mules	3,309	Mature mules	1.9
Mule colts	,388	Mule colts	.23
Ewes and Rams	2,177	Ewes and Rams	1.3
Lambs	1,302	Lambs	.77
Mature hogs	58,640	Mature hogs	35.1
Spring pigs	34,643	Spring pigs	20.35
Chickens	71,120	Chickens	85.
Total animal units	216,776	Animal units	31.17

Receipts

Receipts from sale of stock $3,665,026	$2,190.
Value of animals slaughtered $98,537	$59.

Live-stock.

Census figures for entire County (Atchison).		Average figures per farm for Atchison County.
Receipts.		
Kind		
Receipts from sale of dairy products	$47249	$28.25
Receipts from sale of poultry & eggs	$94580	$56.70
Value of honey & wax produced	$693	.41
Value of wool produced	$2818	$1.68

Current Expenses.

Regular hired labor	$328,884	$196.20
Board for hired labor	74,465	44.60
Repair for machinery,	not given.	Estimated 39.10
Repair of building,	not given.	Estimated 101.
Feed-grain concentrates	$544,288	326.00
Fertilizer	551	.33
Twine	not given.	Estimated 2.95
Thrashing	not given.	Estimated 7.81
Taxes,	not given.	Estimated 91.60
Total expense	$948,188	$809.59

The charge for maintenance of buildings was 5 per cent and 10 per cent for maintenance on machinery and tools. The charge for taxes was 40 cents per $100 valuation. The thrashing charge was 2 cents for oats and 4 cents per bushel for wheat, thus amounting to $7.81 10% depreciation on $391. amount invested in machinery gives $39.10 repair expense, while on buildings 5% depreciation makes $101.00 building repair. The twine used in harvesting grain cost 21 cents per acre, making a total expense for twine of $2.95

Summary for Atchison County.

Capital	$22,900.	
Receipts crops	369.84	
Stock sold	2190.00	
Miscellaneous receipts	146.04	
Total receipts		$2705.88
Total expenses		809.59
Farm income		1896.29
Interest on capital at 5%		1145.00
Labor income		$751.29

The labor income, or the amount the farmer received for his labor was $751.29 This represents the average labor income per farm for Atchison County. With each survey-record a number of efficiency factors were worked out. The most important of these factors however are the receipts per $100 worth of feed and the crop index. The former is calculated as follows; the feed per live-stock unit was $63.11 There were 7.7 (work horses) x $63.11 gives $485.94 The total farm feed $1956.45

minus $485.94 = $1470.51 cost of feed for the stock other than work horses. The $1470.51 worth of feed returned $2336.04 from the sale of stock and stock products. Then $1470.51 : $2336.04 :: 100 : X = $158.85 Therefore every $100. invested in feed returns $158.85 in receipts from sale of stock.

The crop index is found in the following way;

Per farm,

Crop	Acres	Total yield		Average yield for state.
Corn	85.3	2940 Bu.	÷	26.9 = 109.20
Oats	9.45	240. "	÷	23.1 = 10.38
Wheat	4.60	75.4 "	÷	14.8 = 5.09
Hay	15.30	24.2 Tons	÷	1.1 T.=22.
	114.65			146.67

146.67 ÷ 114.65 = 127.9 crop index. The crop index of 127.9 means that the crop yields in this county are 27.9 per cent above the average. The percent receipts from crops is found by dividing $369.84 the total receipts from crops by $2705.88 the total farm receipts and multiplying by 100 gives 13.6 per cent. The working capital is the amount invested in live-stock, machinery and tools ($2952) for the average farm in Atchison County. The average number of cows per farm was 5.4 and the receipts per cow was $5.23. The number of work horses was 7.7 per farm,with an average of 54.3 productive days of labor for each horse. The horse work units were determined as follows: The amount of horse labor required to grow an acre of corn is 40 horse hours; for wheat 27; for oats 18 horse hours.

Thus, by simple multiplication, the total number of horse hours put in on crops and productive live-stock was obtained. Ten hours of work constitutes a productive work day done by either man or horse. The total horse work hours per farm in Atchison County was 4186, which divided by 10 gives 418.6 days of productive labor furnished by 7.7 horses. The man work units were obtained in the same way, for instance; it requires 22 man hours to grow an acre of corn, 13 man hours for wheat and 10 man hours for oats. Thus the man work units were found for all the various crops and different kinds of live-stock. The value of the feed produced on the farm was $1935.45 The receipts from the sale of feedable crops were $305. Thus $1935.45 minus $305. equals $1630.45 Then $1630.45 plus the grain concentrates purchased $326. equals the total feed used $1956.45 per farm. $1956.45 divided by the total animal units (31.17) gives $63.11 the feed fed per live-stock unit.

Brief History of People and Area Studied.

Illinois.

It is known as the prairie State. Its location has greatly influenced its settlement and development. More than nine-tenths of the state is within the glaciated area. To this fact, Illinois is indebted for most of its fertile soil and for the gentle topography which has made easy the building of wagon roads and railroads and the use of labor-saving farm machinery.

Of the entire land area, over nine-tenths is in farms, and the counties in the central and northern parts have, in the greater number of cases, from 90 to 95 per cent of their land in farms, and a comparatively large number 95 per cent.

The southern counties show, in frequent instances, from 80 to 90 per cent of their total area in farms. In 1910 the average acres per farm was 129.1 while the value of all farm property was $3,905,321,075. and the average property per farm was $15,505. Illinois is not a fruit section, but the most important of the orchard fruits is the apple. Illinois is the most important manufacturing state west of the Alleghanies. It has excellent railroad facilities and has the advantages of cheap water transportation. In the value of its manufactures, Illinois ranked fifteenth in 1849 and third in 1909.

The population per square mile in 1910 was 100.6

Kind of People.

The people are progressive, and awake to many of the up-to-date methods of farming. They give considerable attention to the selection of pure seed and pure-bred live-stock.

In 1910, 58.6 per cent of the farms of Illinois were operated by owners and managers; 41.4 per cent operated by tenants; 26.7 share and share cash and 14.8 cash tenants. There are 86.2 per cent of the farmers native white; 13.3 per cent foreign born white and only 0.6 per cent negro and other non-white.

ILLINOIS

Representative area used as a basis for study.

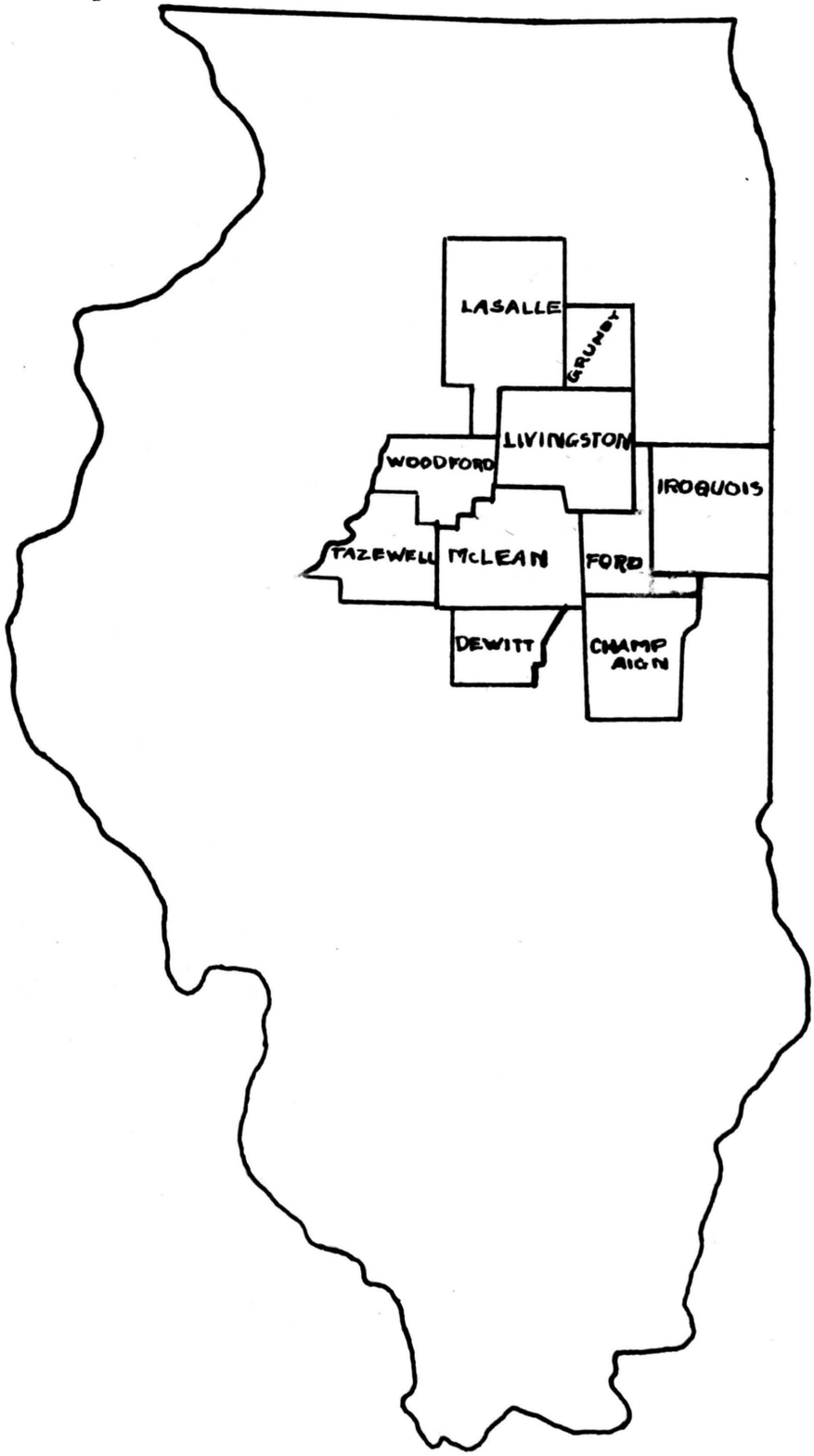

Fig. 1 - Map of Illinois, showing the location of the ten counties (including 29000 farms) used in getting the average data.

Type of Farming.

The type of farming carried on in any region, depends upon the soil, climate, topography, distance from market, and character of its people. Illinois is a typical grain farming section and corn is the principal cereal crop. The table below gives the most important facts relating to the principal crops grown in Illinois in 1910.

Table = 1 =

Crops	Acreage	Bushels produced	Value
Corn	10,346,000.	300,034,000.	$183,021,000.
Wheat	2,500,000.	46,250,000.	46,712,000.
Oats	4,300,000.	125,990,000.	55,436,000.
Barley	55,000.	1,622,000.	989,000.
Rye	49,000.	784,000.	666,000.
Potatoes	124,000.	7,440,000.	4,538,000.
Hay	2,250,000.	1 ,912,000. Tons	27,533,000.
Tobacco	600.	468,000. Lbs.	56,000.

This table shows the vast amount of corn produced in Illinois.

Table = 2 =

Receipts from Sale of Feedable Crops, 1910.

Crops	Farms Reporting		Quantity Sold		
	number	Per cent of all farms	amount	unit	Amount received
Total	- - -	- - -	- - -	- - -	$104,425,194.
Corn - -	102,733	40.8	128,518,179	bu.	70,454,460.
Oats - -	80,222	31.9	69,981,451	"	28,182,106.
Barley -	1,403	0.6	305,044	"	164,764.
Hay and coarse forage	40,654	16.1	565,217	tons	5,623,864.

The total value of crops produced in Illinois in 1910 was $318,951,000 while the total receipts from the sale of feedable and salable crops were $151,137,194. The total receipts from the sale of live-stock were $147,060,674.

The total amount expended by Illinois farmers for the purchase of feed in 1910 was $13,916,000. but the total receipts from sale of feed was $104,425,194. This shows the vast amount of feed sold in Illinois. Over half of the farmers hire labor and the average amount expended by those hiring labor is $259. Tables 1 and 2 indicate that the type of farming carried on in Illinois is mostly grain farming.

Soil and Topography.

The soils of Illinois vary greatly in fertility. In the glaciated section the soils are very rich in mineral plant foods, for they constitute an intimate mixture of materials, ground up by ancient glaciers. In the unglaciated section the residual soils of the upland are, as a rule, less fertile. A very large proportion of the total land area of Illinois is topographically suited to the best forms of grain farming, while the great variety of soil and the favorable location with regard to transportation and markets have made possible a diversified and profitable agriculture. The soil is rich and deep. Much of the state has a nearly level surface. The general slope is from North-east to South-west.

Climate and Rainfall.

Illinois is near the center of the humid region of the United States and has a climate highly favorable for the growth of many crops and for most human activities. The State lies across the paths of many cyclonic storms, which bring it frequent, and at times, sudden changes of weather. The climate is little modified either by contrasts of topography or by the influence of the Great Lakes. Cold waves invade all parts, and high temperature prevails in all sections for longer or shorter intervals, almost every summer. The mean temperature for July ranges from 70° F. in the extreme north-east to about 80° F. at Cairo.

The mean temperature for January ranges from 20° F. and less, in the north, to 30° F. and more in the southern counties. The growing season, the period between the latest and earliest killing frosts, is about six months long at the north, and about seven months long at the south.

The mean annual rainfall ranges from 43 inches at the south end of the State to 33 inches at the north end; the average for the State is about 38 inches.

Indebtedness.

Of the total number of farms (251,872) in the State in 1910, 60.8 per cent were free from mortgage, and 39.2 per cent were mortgaged. The average debt per farm the same year was $3135, and the average equity per farm was $9179. The average debt of mortgaged farms increased in 20 years from $1,684 to $3,135 or 86.2 per cent, while the average value of such farms rose from $4,862 to $12,314 or 153.3 per cent, so that the owner's equity increased on the average, from $3,178 to $9,179 or 188.8 per cent.

Alabama.

Alabama ranks according to 1910 figures, as the eighteenth state in the Union in population, twenty-seventh in size, and ninth in order of admission.

There is considerable mining of iron ore and bituminous coal and the total value of the mineral products in 1910 was $24,350,667. The tendency to lease farms to tenants or on shares is characteristic of Alabama, as well as the other southern states. The population of Alabama is preponderantly rural, as shown by the fact that in 1910 the rural population was 1,767,663, while the urban was only 370,431.

The condition of public education in Alabama has been unsatisfactory since the close of the civil war. The causes are many. There is no compulsory Education law in the State, and those who are in charge of the schools have no means of compelling attendance.

The large proportion of negroes in the State adds another difficulty to the problem. These causes resulted in a percentage of illiteracy in Alabama that is excelled in but two other states, South Carolina and Louisiana. There is no legal provision for taxation for educational purposes in the State, but each county is allowed, under the Constitution, upon a vote of 60 per cent of the people, to levy a tax of one mill or 10 cents on each $100 of property, to obtain a supplement school fund for the exclusive use of the county levying it.

In the southern states the land is held at a lower price, because two races occupy the land, necessitating two sets of social institutions. This greater overhead charge, makes the land less valuable.

Kind of People.

The people of Alabama are non-pregressive and not so interested in co-operation and new agriculture. The farmers are mixed,white and black, mostly tenants; have practically no interest in education or up-toedate methods of farming. They believe in the old saying, "Eat, drink and be merry, and let tomorrow take care of itself."

Of the farmers in Alabama, 152,458, or 58 per cent were whites and 110,443, or 42 per cent, non whites. All but 1,244 of the white farmers were native born. Of the other than white farmers, nearly all (110,387) are negroes, the remaining 56 being Indians. Among the native white farmers, 42.9 per cent were tenants, as compared with only 9.9 per cent among the very small number of foreign born white. Among non-white farmers, the tenants constituted more tham five-sixths (84.5 per cent) of the total number. Of the 1,244 foreign-born white farmers in Alabama in 1910, 462 were born in Germany, 167 in Sweden, 144 in England, and 53 in Hungary.

ALABAMA

Representative area used as a basis for study.

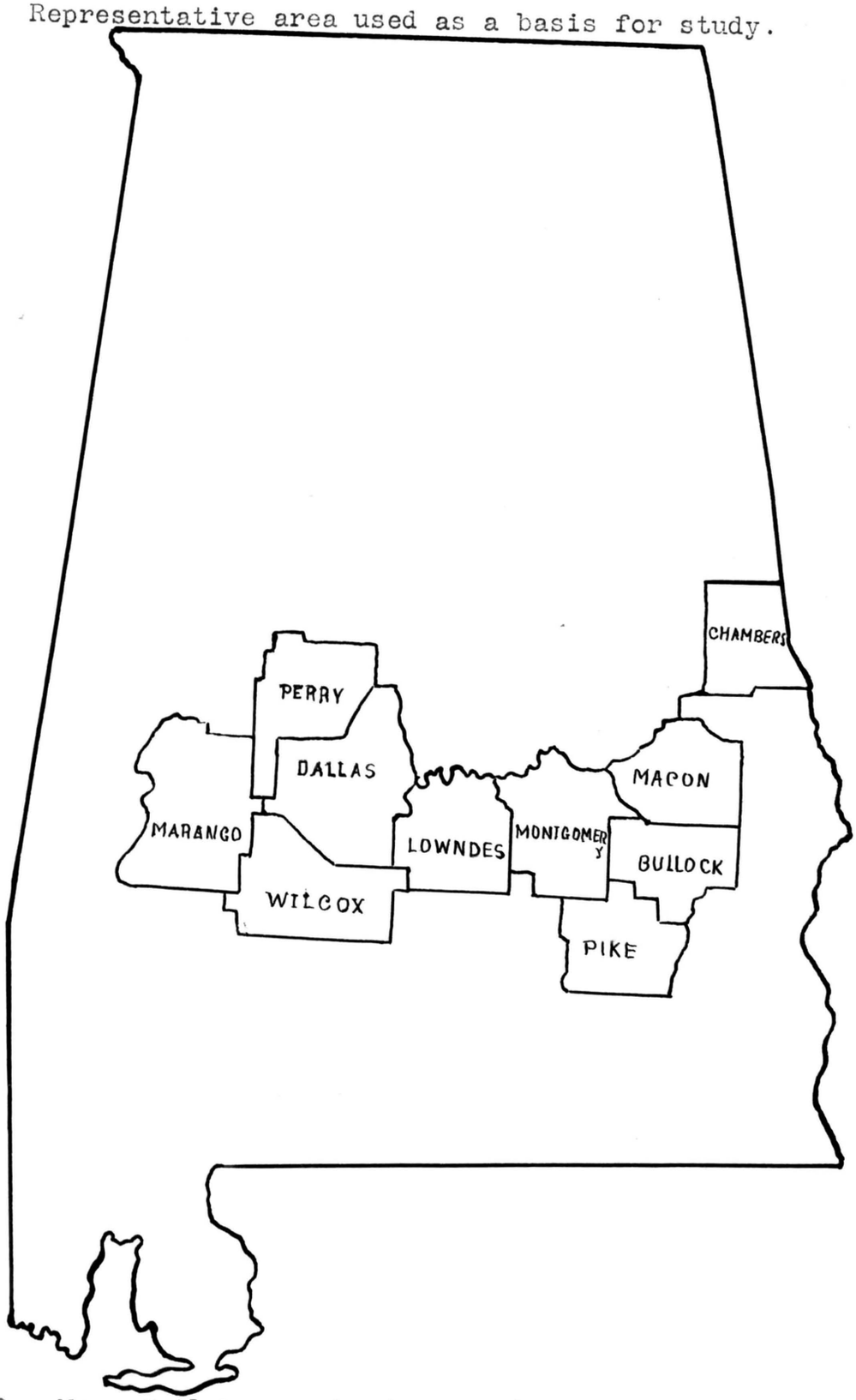

Fig.2 - Map of Alabama, showing the location of the ten counties (including 58322 farms) used in getting the average data.

Type of Farming.

The type of farming practiced in Alabama is a one-man type, with cotton as the principal crop. The farms are very small and most of the land in cultivated crops. Very little live-stock and machinery are kept,per farm. The following table shows the acreage, production and value of principal crops in 1912.

Table = III =

Crop	Average	Bushels Produced	Value
Corn	3,150,000	54,180,000	$44,120,000
Wheat	30,000	318,000	359,000
Oats	260,000	5,200,000	3,224,000
Potatoes	15,000	1,215,000	1,094,000
Hay	209,000	261,000	3,811,000
Tobacco	300	225,000	79,000
Cotton	-------	1,330,000 bales	74,205,236

The value of the cotton crop in 1909 was over twice the aggregate value of all the other crops combined. The total acreage of the combined cereals, in 1909 was slightly more than three-fourths as great as that of cotton and their value about two-fifths as great. The total value of the cotton crop for 1909 was $74,205,236. while the receipts from the sale of live-stock were $13,150,064. The above figures indicate that cotton growing is the principal agricultural occupation.

Table = IV =

Crop	Year 1910	Average yield per acre		Average value per acre
Corn	1910	11.9	bushels	$11.15
Oats	"	12.6	"	8.23
Peanuts	"	15.6	"	14.82
Hay & Forage	"	1.05	tons	14.07
Sweet Potatoes	"	79.8	bushels	53.72
Cotton	"	0.30	bales	19.89

This table shows that the two most valuable crops per acre are Sweet potatoes and Cotton. The yields per acre are very low in this section, as only 11.9 bushels of corn per acre and 12.6 bushels of oats are produced.

Table = V =

Acres Harvested

Crop year	Corn	Oats	Peanuts	Hay and Forage	Sweet Potatoes	Cotton
1909	2,572,968	257,276	100,609	238,656	66,613	3,730,482
1899	2,743,360	216,873	78,878	85,353	50,865	3,202,135
1889	2,127,302	344,788	23,955	39,993	56,650	2,761,165
1879	2,055,929	324,628	------	12,916	43,256	2,330,086

In table V throughout the period, cotton shows a constant and uniform increase in acreage. Corn shows a substantial increase in acreage for the 20 years, 1879 - 1899, but a decrease during the last decade. Thus we see that the farms are small in Alabama and that cotton is the principal money crop.

Soil and Topography.

In the north and middle divisions of the State, the soil is red or yellow loam over stratified rocks, while in the cotton belt section of the state, the soil is black and ranges from 2 to 20 feet in depth. In the extreme southern counties, the soil is light and sandy. The soils suitable for cultivation are extremely varied. They range from dark, mucky loams along the immediate coastline, to sands, sandy loams, fine sandy loams, and heavy clay soils.

The Appalachian Mountain system extends into the State from northern Georgia in series of low parallel ranges. To the southeast of these ranges lies the comparatively level Piedmont region. To the southwest, at the very terminus of the mountain system is the low-lying Cumberland, plateau - the coal fields of Alabama. The southwest three-fifths of the State constitute the coastal plain, which slopes gradually from an elevation of about 600 feet to the sea level.

Climate and Rainfall.

Excepting in the lowlands along the rivers, the climate is excellent, particularly in the north. The mean temperature for January being 42.9 F. and for July 83.9 F. The summer heat is tempered by winds from the gulf. The average temperature in the north part of the State is 59.7 F. and the average rainfall is 54 inches in the north part. In the south the temperature increases to 66.6 F. and the average rainfall increases to 63 inches.

Indebtedness.

The average debt of mortgaged farms has decreased in the 20 years 1890 to 1910, from $609 to $538 or 11.7 per cent. The average value of such farms, however, increased, the increase being from $1,392 to $1,680 or 20.7 per cent. Thus the owner's equity rose from $783 in 1890 to $1,142 in 1910 or 45.8 per cent. The negro ownership of land is increasing, while the ownership by white farmers is decreasing. The number of tenants from 1900 to 1910 increased in Alabama 148.7 per cent.

Iowa.

Iowa is a typical plain, with slight relief. The greater portion of the State, though perfectly level, is so free from natural obstructions, that most of the country roads are laid out on section lines.

Iowa ranks twenty-third in land area and fifteenth in population, among the states of the United States. It has passed out of the class of states that are adding to their total farm area. The most valuable of Iowa's mineral resources are the extensive bituminous coal beds found in the south-central quarter of the State. Limestone for building purposes, and lead and zinc ores have been mined in considerable quantities. The principal mining industries are coal mining and clay working, these two contributing about 77 per cent of the total mineral value. Practically the whole of the State is arable land. Over three-fourths of the State, the surface consists of Paleoqoic rocks appearing in parallel belts running north-west to south-west. The north-western part is covered by extensive cretaceous beds, deposited across and over the belts of the other strata.

Iowa has been from its earliest settlements, one of the most important agricultural states in the Union. In 1910, of an approximate land area of 35,575,040 acres, 95.4 per cent, 33,930,688 acres was in farm land, and the improved land in farms was 29,491,199 acres. The average value of all property per farm was $17,259 in 1910, and the average acres per farm was 156.3. The average value of land per acre was $82.58. The general character of agriculture in Iowa is indicated by the fact that about three-fourths of the total value of crops in 1910 was contributed by the cereals, and about one-fifth in hay and forage. The remainder representing 7.9 per cent of the total, consisted mostly of vegetables, fruits, nuts and forest products. The State contains very little timber land. Iowa has occupied a prominent place in the creamery industry ever since its establishment on a factory basis. From 1904 to 1908 the value of the creamery industry increased 72 per cent. The Educational Standards in Iowa are very high, as the percentage of illiteracy was only 1.7 in 1910, lower than any other state. Of the 48,987 foreign-born white farmers in Iowa in 1910, 22.6 were born in Germany. Of the total population of farmers 77.3 were native whites, and 0.1 per cent negroes and other non-white. In 1910, 59.6 per cent of all land in farms was in farms operated by their owners, 1.4 per cent in farms operated by managers, and 39 per cent in farms operated by tenants.

IOWA

Representative area used as a basis for study.

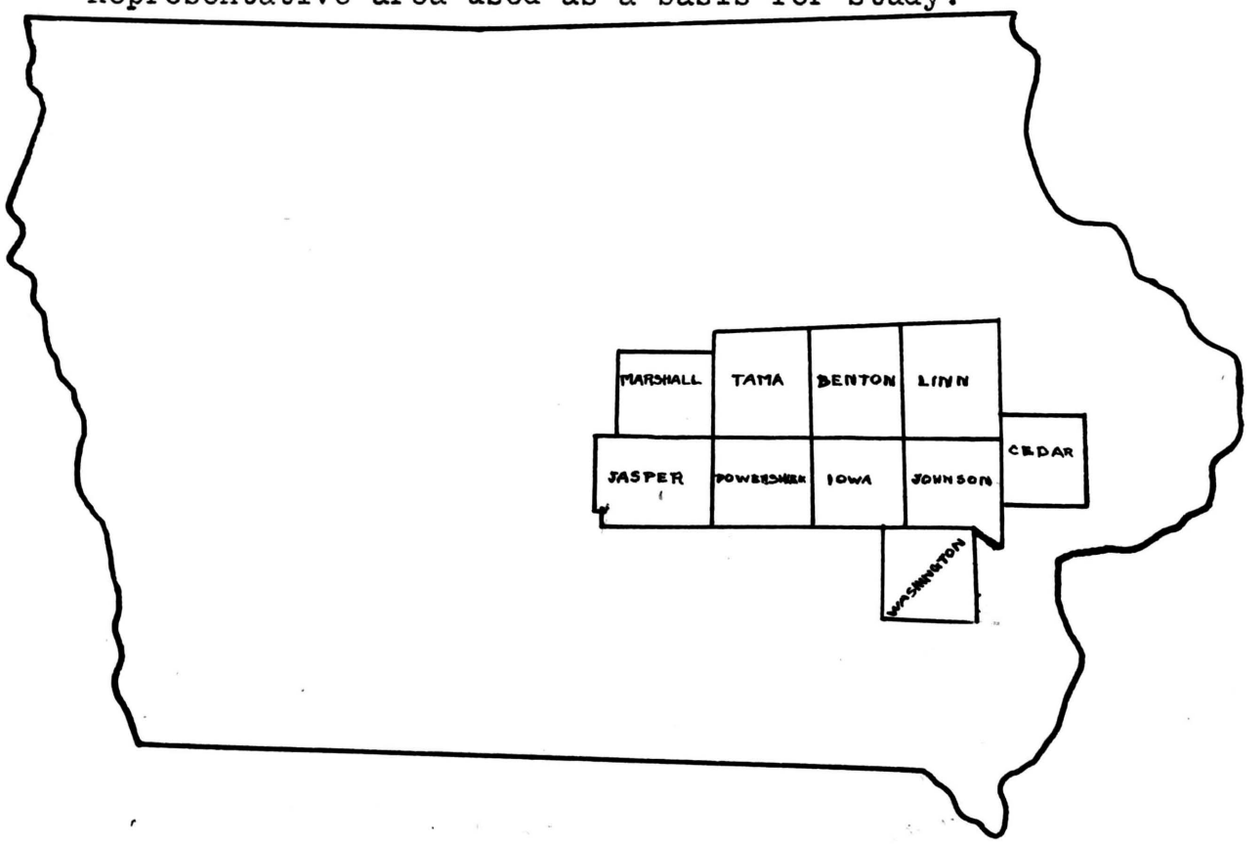

Fig.3 - Map of Iowa, showing the location of the ten counties (including 26478 farms) used in getting the average data.

Type of Farming.

Iowa is a typical live-stock section. The total value of domestic animals sold during 1910 was $208,069,000 and that of animals slaughtered on farms was $10,147,000 and the total value of all domestic animals on the farms, was $393,003,000. The value of cattle represented 30.2 per cent of total value of live-stock, horses and mules 47.2 per cent, swine 17.7 per cent, sheep and lambs 1.5 per cent and poultry 3.1 per cent.

Table = VI =

Receipts from sale of feedable crops in 1910.

Crop	Quantity Sold		Amount Received.
Total			$57,034,312
Corn	66,370,906	bushels	34,681,925
Oats	41,311,243	"	16,407,511
Barley	5,075,639	"	2,472,786
Hay and coarse forage	448,721	tons	3,472,090

The total amount spent for feed by the Iowa farmers in 1910 was $18,582,000 and the total amount of feed sold was $57,034,000. The receipts from the sale of live-stock were $218,216,303. Thus we see that Iowa is principally a live-stock producing State. Of the 15,041,039 acres reported for cereals in 1910, over three-fifths were in corn, which together with the acreage of oats, formed over nine-tenths of the whole.

Table = VII =

Crops Leading	Acreage	Bushels Produced	Value
Corn	10,248,000	389,424,000	$144,712,000
Wheat	810,000	15,066,000	14,463,000
Oats	5,000,000	165,000,000	67,650,000
Barley	360,000	9,360,000	5,148,000
Potatoes	147,000	12,642,000	7,459,000
Hay	2,950,000	4,071,000	41,117,000

The total value of the crops in 1909 was $314,666,000 and the combined acreage of crops in that year was 20,374,925 representing 69.1 per cent of the total improved land in farms. Iowa is not a great producer of orchard fruits like Missouri and other states. The total quantity of orchard fruits produced in 1910 was 7,234,000 bushels, valued at $4,284,000.

Soil and Topography.

The five different soil areas are distinguished, consisting of the glaciated plateau covering the north central two-fifths of the State; the deep loess soils bordering the Missouri and Mississippi Rivers, and also extending from the east in a narrow belt nearly to the center of the State, together covering nearly one-third of the State; the shallow loess soil of the south central section, covering about one-fifth of the State, the small unglaciated section in the north-east corner; and narrow lines of alluvial soil along the Mississippi and Missouri Rivers.

The soils are mainly dark brown to almost black, clay loams, silt loams, and loams with a small amount of sandy loams in scattered areas. With few exceptions, these soils are deep, fertile and well supplied with organtic matter.
With the exception of a small section in the extreme north-eastern part of the State, where the Mississippi River is bordered by rugged bluffs, the surface of the State is undulating to rolling, and in a few sections, hilly. The chief drainage of the State is eastward to the Mississippi River.

Climate and Rainfall.

The climate in different parts of Iowa shows only slight variations, which are mostly due to differences in latitude and altitude. The mean annual temperature is 47.5°F.
The highest temperature recorded, is 113°F. and the lowest is -43°F. giving the remarkable range of 156°F.
The average winter temperature is 20.7°F., spring 47.5°F., summer 71.3°F., and autumn 50.5°F. The average annual rainfall is 31.5 inches, more than two-thirds of which usually falls during the six crop months, April to October.

Indebtedness.

The average debt of mortgaged farms increased in the 20 years, 1890 to 1910, from $1,319 to $4,048 or 207 per cent, while the average value of such farms rose from $3,064 to $14,574 or 267.7 per cent. The mortgage indebtedness which was 33.3 per cent of the value of the mortgaged farms in 1890 had decreased to 27.8 per cent of the value in 1910.

Missouri.

Missouri is a great Agricultural State because of her rich, fertile soil and bountiful crops. This State has a most diversified type of soils, ranging from the most fertile to very thin fruit and grazing lands. Missouri is especially noted for the production of high flavored fruits. It leads in the production of barytes and tripoli and ranks second in the production of mineral paints. The combined value of zinc and lead represents about 60 per cent of the entire mineral output of the State. From 40 to 45 per cent of both the zinc and the lead produced in the United States comes from Missouri. The principal lead producing counties are St.Francois and Madison. The lead ores of Missouri carry very little silver, and the lead produced is known as soft lead. The mining of coal in Missouri ranks third in the industries of the State, while the Clay products rank fourth in the value of the mining industries. Portland Cement is another important mineral product of Missouri. Other mineral products are copper, occasional gems, iron ore, mineral water, natural gas, pyrite and silver. The land area in 1910 was approximate 43,985,280 acres, - 34,591,248 acres were in farms of which there numbered 277,244. The improved land in farms amounted to 24,581,186 acres or 56 per cent of the total area.

The production of orchard fruits, chiefly of apples, is an important agricultural industry. The total quantity grown in 1909 was 11,957,399 bushels, valued at $6,582,578. Of the total production, apples contributed 9,968,977 bushels, with a value of $4,885,544. Other important orchard fruits are peaches and nectarines, pears, plums, prunes and cherries. Of small fruits, the most important is the strawberry, of which 15,171,034 quarts valued at $1,122,784 were grown in 1910. Missouri's total value of domestic animals of all kinds, on the farms in 1910, was $273,366,662. Missouri had always been noted for the quantity and value of her mules. In 1910 Missouri ranked tenth,in the value of manufactured products.

MISSOURI

Representative area used as a basis for study.

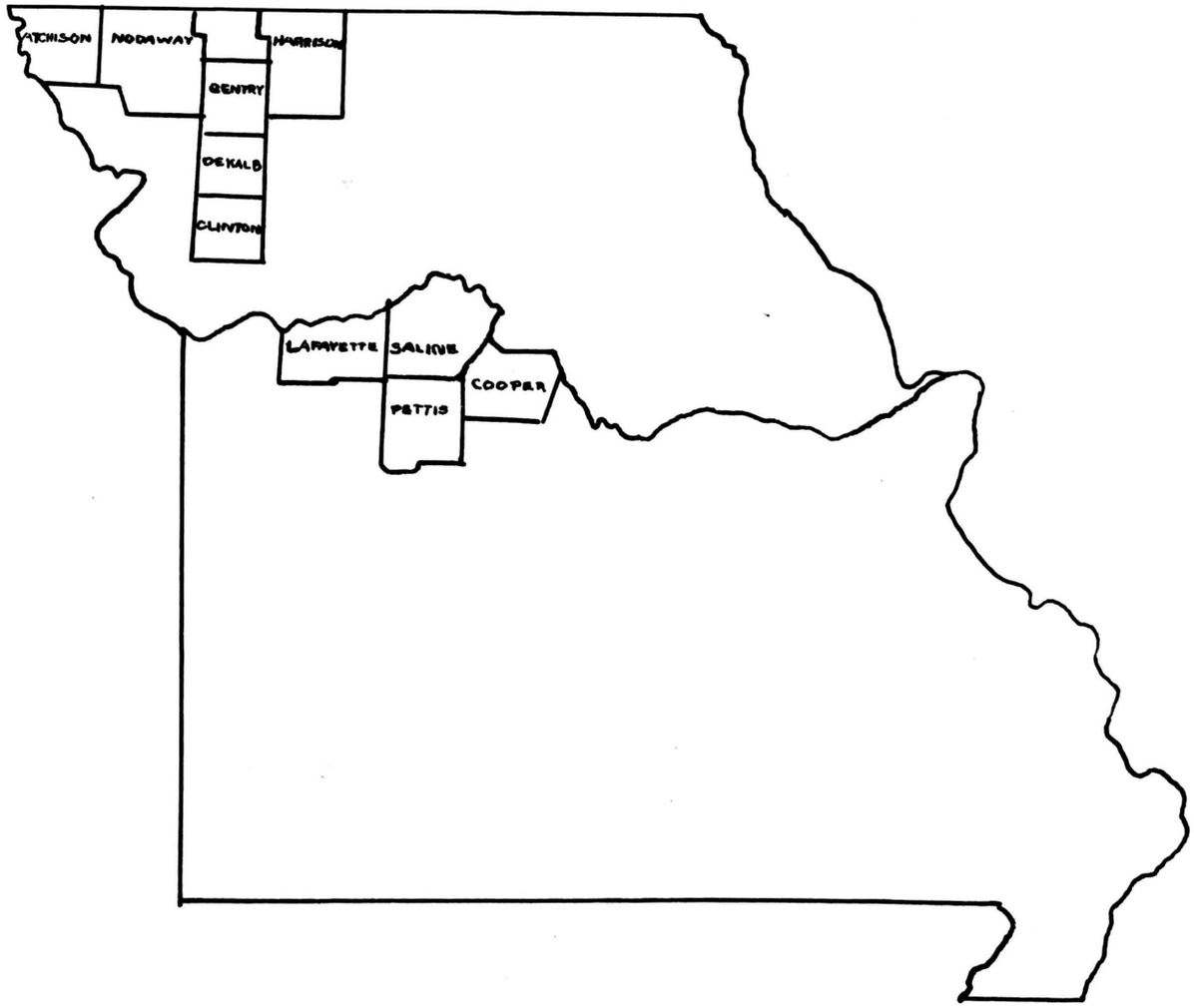

Fig.4 - Map of Missouri, showing the location of the ten counties (including 26507 farms) used in getting the average data.

Kind of People.

The farmers of Missouri are becoming progressive, they are learning that the Scientific art of farming is just the right and most profitable way of handling the farm business. The Missouri farmers have been very conservative and independent toward new methods and practices; they have prefered isolation, by rejecting co-operation and social advantages. The farmer has considered that all the farm activities are muscular, and that it was a waste of time to get together and discuss important problems, and rural life improvement.

Of all Missouri farmers,93.5 per cent were native whites, 5.2 per cent foreign-born whites, and 1.3 per cent negroes and other non-whites. Of the 14,467 foreign-born white farmers in Missouri in 1910, 8,453 were born in Germany, 1,048 in England, 883 in Ireland, 850 in Switzerland, 551 in Sweden, 546 in Canada, 504 in Austria, 291 in Scotland, 248 in France, 190 in Denmark, 167 in Italy, 163 in Wales, 109 in Hungary and 103 in Holland.
In 1910, 72.8 per cent of all land in farms, was in farms operated by their owners, 1.8 per cent in farms operated by managers, and 25.4 per cent in farms operated by tenants.

Type of Farming.

The type of farming practiced in Missouri is diversified. Missouri has many different types of farming going on in her borders, such as grain, truck, live-stock, grain and stock combined, and fruit farming.

The general character of agriculture, is indicated by the fact that about two-thirds of the total value of crops in 1909 was contributed by cereals, and 15.3 per cent by hay and forage. The remainder consisted chiefly of potatoes and other vegetables, forest products and fruits and nuts. The total value of domestic animals sold during 1910, was $143,967,000 and that of animals slaughtered was $15,272,000. The total value of orchard fruits produced was $6,583,000.

The following table shows the acreage, production, and value of some of the principal crops in 1914.

Table - VIII.

Products	Acreage	Bushels Produced	Value
Corn	7,200,000	158,400,000.	$107,712,000.
Wheat	2,549,000	43,333,000.	42,466,000.
Oats	1,200,000	25,800,000.	11,352,000.
Rye	17,000	238,000.	207,000.
Potatoes	87,000	3,915,000.	2,858,000.
Hay	2,600,000	1,820,000.	24,752,000.
Tobacco	4,100	4,920,000.	640,000.
Cotton	122,000	75,000.	2,336,000.

This table shows that the principal crops in Missouri are corn, wheat, hay, oats, potatoes and cotton.

The receipts from the sale of feedable crops in 1910 were as follows;

Crop	Quantity Sold	Amount received.
Total		$20,077,983
Corn	25,777,282 bushels	15,022,413
Oats	4,684,498 "	1,898,373
Barley	9,730 "	5,833
Hay & Coarse Forage	363,533 tons	3,151,364

Less than half of the farmers hire labor, the average amount expended by the farmers hiring being $154. About two farmers out of every five, buy some feed, but only one out of every fifteen purchase fertilizer in Missouri.
The receipts from the sale of live-stock were $159,239,222. The above figures show that Missouri has a diversified agriculture.

Soil and Topography.

The soils vary with the underlying character of the rock, the topography and the drainage. In the Ozark region the soils are gray, brown or red in color, rarely black and are well drained in both soil and subsoil. The texture of the fine material is usually fine-grained, silt loams predominating in the soils, and silty clays in the sub-soil. They are rather stony, and occur as a rule, on a rolling, to rather rough topography, the stone content being predominantly chert.

The gray soils are usually deficient in lime, while the red soils and the subsoils carry a fair amount. In the prairie region, the soils are rather light in color, in the eastern part, becoming darker west-ward and north-ward. They are, as a rule, somewhat heavier than the Ozark soils, are practically stone free, have good surface drainage, except on flat areas, and have a moderate lime content, except the soils on the flat areas in the eastern part. In most of the prairie region, the soil is dark enough to be called black. In the southeastern part, the soils are mostly alluvial and like these soils in all other parts, are fertile.

The area of the State includes portions of three of the great topographic provinces of the United States which may be designated as the prairie plains, the ozark region and the coastal plain. The prairie plains occupy all of the northern part of the State, except a narrow belt along the Missouri River east of Glasgow, and one along the Mississippi River in Marion, Pike and Lincoln Counties. South of the Missouri River the prairie plains consist of a smooth to undulating eastern belt and a rolling western belt. North of the Missouri River the surface of the prairie plains has a thin veneer of glacial material, which does not occur south of the river. The Ozark region occupies all that part of the State not occupied by the prairie plains, except the area south of Cape Girardeau and Poplar Bluff.

It is essentially a plateau which slopes gently, and almost imperceptibly to the surrounding country. The low, blunt peaks and short rounded ridges of hard igneous rocks, and the great number of valleys, have made of it a hilly country as a whole. The coastal plain in Missouri lies in the extreme south-eastern part. It barely exists as a true coastal plain area, most of it having been converted long ago, into broad, level river valleys. The topography of Missouri leaving the valleys out of consideration, is of plains varying in elevation. Their original surfaces have been almost completely destroyed by the cutting of valleys in them. Missouri is well drained by streams flowing east-ward into the Mississippi River, either directly, or thru the Missouri River and Arkansas River. The rocks of Missouri were laid down during the Archean, Paleozoic and Cenozoic periods. The rocks of the Ozarks region are predominantly limestone, while in the prairie region the rocks are predominantly shales. The coastal plain region consists of shales, clays, and sand stones.

Climate and Rainfall.

Missouri lies in the milder half of the warm temperate zone. Being far inland, the State is subject to the extremes of a continental climate, which are all the more accentuated by the fact that it is in the path of frequent cyclonic storms. The average January temperature ranges from 35°F. in the south-eastern to 20°F. in the north-western corner. For July the temperature is 80°F. in the extreme south and 75°F. in the extreme north.

The average date of the last killing frost in spring, is about the middle of April, though it may occur as late as the middle of May. The average date of the first killing frost in the fall, is about the middle of October, though it may occur as early as September 25. The average length of the growing season is about 180 days, with a minimum of about 130 days.

The rainfall ranges from 35 inches per year, in the north, to 50 inches at the Arkansas line. Droughts lasting 30 days sometimes occur. The average relative humidity for the year is less than 70 per cent over the whole State. The prevailing winds are west and north-west in January, and South in July.

Indebtedness, 1890 - 1910.

The average debt of mortgaged farms increased in the twenty years, 1890 to 1910 from $853 to $1,758 or 106.1 per cent, while the average value of such farms rose from $2,643 to $6,083 or 130.2 per cent. Thus the owners equity increased on the average from $1,790 to $4,325 or 141.6 per cent. The average acres per farm were 124.8 in 1910 and the average value of all farm property was $7,405.

Kansas.

Kansas has a area of 82,158 square miles, giving it the thirteenth rank in size among the states of the Union. Kansas reflects two great regional influences. The first of these, and the greater, is that of the central prairies of the United States. The second is that of the frontal plain of the Rocky Mountains. There are three belts, or Strata which cross Kansas, from North to South. The eastern Stratum consists of numerous layers of sandstone, limestone, shales and clay with imbedded seams of coal. Deposits of bituminous coal are found in at least five seams of workable thickness. The natural gas which occurs in the southern part, is utilized largely for fuel and smelting purposes. The two principal mineral products of Kansas are fuels, - coal and natural gas, these constituting nearly 45 per cent of the value of minerals produced. Western Kansas is an important dairying and stock raising region. The insufficient rainfall renders the cultivation of cereals uncertain, and the greater part of the area is divided into ranges for the growing of cattle. Kansas is one of the leading wheat growing states, and ranks third in the value of flour-mill and grist-mill products. The manufacturing of glass is a very important industry. Kansas has admirable transportation facilities. The State is traversed by several important railroads.

KANSAS

Representative area used as a basis for study.

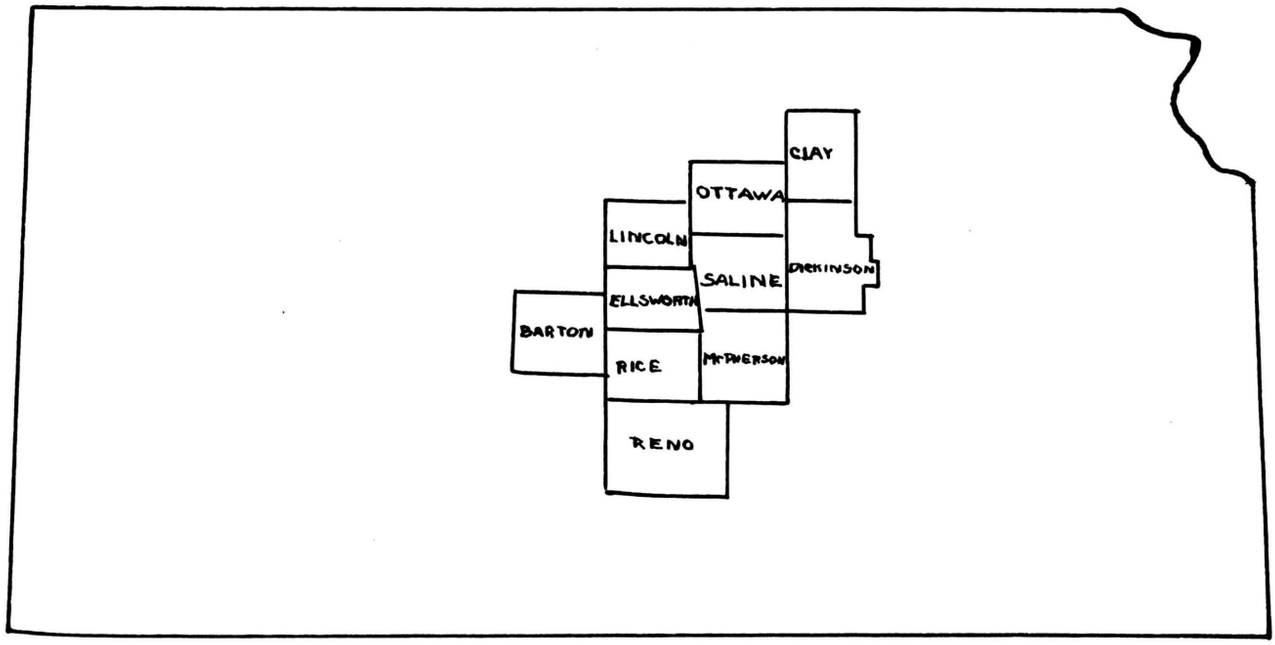

Fig.5 - Map of Kansas, showing the location of the ten counties (including 20903 farms) used in getting the average data.

Kind of People.

The farmers of Kansas are users of labor-saving machinery in sowing and harvesting the wheat crop. They are very progressive and co-operate to a considerable extent. Of all Kansas farmers, 84.5 per cent were native whites and 14.5 per cent foreign-born whites; only 1 per cent were non-whites. Of the non-whites, 1,532 were negroes, 157 Indians and 2 Japanese. Of the native white farmers 39.9 per cent were tenants, as compared with 33.8 per cent among the non-whites. Only 18.8 per cent of the foreign-born white farmers were tenants. Of the 25,804 foreign-born white farmers in Kansas in 1910, 8,705 were born in Germany. In 1880, 16.3 per cent of the farms were operated by tenants. In 1909 about 37 farms out of every 100, were operated by tenants.

Type of Farming.

The type of farming practiced in this section is grain farming, with corn and wheat as the principal crops. This will be shown by the following table;

Table - IX.

Crop	Acreage	Bushels produced	Value
Corn	5,850,000	108,225,000	$68,182,000
Oats	1,760,000	58,960,000	24,763,000
Wheat	8,660,000	177,200,000	168,340,000
Barley	240,000	5,880,000	2,764,000
Rye	50,000	1,000,000	800,000
Hay	1,650,000	2,492,000	18,441,000
Potatoes	72,000	4,464,000	3,437,000

The above table shows that wheat is the most important and valuable crop,with corn second and oats third.

Western Kansas is an important dairying and stock-raising region. The receipts from the sale of live-stock were $137,923,252 while the value of wheat produced was $168,340,000. Table IX shows that wheat growing is the most important industry. The insufficient rainfall renders cultivation of cereals uncertain, and the greater part of the area is divided into ranges for the growing of cattle.

Table - X.

Receipts from sale of feedable crops.

1910 Crops	Quantity Sold	Amount Received
Total		$22,911,128
Corn	32,096,114 bushels	17,456,230
Oats	3,224,460 "	1,375,143
Barley	578,855 "	277,836
Hay & Forage	624,428 "	$3,801,919

The total amount expended for feed by Kansas farmers in 1910 was $17,815,000 while the total receipts from sale of feed was $22,911,000.

The following table shows the principal crops and the fluctuations in the last thirty years;

Table - XI.

Acres Harvested,

Crop	1909	1899	1889	1879
Corn	8,109,061	8,266,018	7,314,765	3,417,817
Oats	933,309	900,353	1,463,526	435,859
Wheat	5,973,785	3,803,818	1,582,635	1,861,402
Barley	166,115	119,158	7,201	23,993
Hay & Forage	3,957,745	4,337,342	3,723,452	1,281,997
Potatoes	79,025	85,318	112,734	_____

Wheat is the principal salable cereal crop.

Soil and Topography.

The principal soil is a brown, silty loam, well adapted to the production of general farm crops. The soil in the north-eastern part of Kansas consists of a glacial drift, which covers the entire area and produces a soil of extreme richness. In the western third, the soil covering has migrated eastward from the Rocky Mountains, and now lies in places 300 feet thick.

The surface of Kansas on the whole, is a gently-rolling prairie, diversified by low hills. By the general land slope, practically all the rivers flow eastward; and owing to the regular decline in elevation, the drainage is so perfect that there are no marshy tracts and no lakes of any size.

Climate and Rainfall.

The climate of Kansas is continental, owing to the location of the State. The air is clear, and sunny days by far predominate. The winters are as a rule, mild and dry, though cold waves occur. The mean annual temperature ranges from 52 F. in the north to 58 F. in the south.

The rainfall is due to the great areas of low pressure, which cross the State from west to east. The mean rainfall for the whole State is 26.4 inches, but it ranges from 40 inches in the east, to nearly 20 in the west. Most of the rainfall is in the early summer.

Indebtedness.

The average debt of mortgaged farms increased in the 20 years, 1890 to 1910, from $1,126, to $2,326 or 106.6 per cent, while the average value of such farms rose from $3,129 to $9,430 or 201.4 per cent. Thus the owner's equity increased from $2,003 to $7,104 or 254.7 per cent.

California.

California is popularly known as the Golden State. It has 58 counties, ranks second in area and twelfth in population. The total land area is 155,652 square miles. California may well be called the orchard of the United States. The State has many of the advantages of the Mediterranean zone. The fruit crop is generally abundant and of good quality.

California is rich in mineral deposits, particularly gold. This State is by far the largest producer of quicksilver. Out of a total product in the United States in 1912 of 25,064 flasks, 20,524 flasks were produced in this state. California is one of the most important clay working states. In the value of the products in 1912, it ranked eighth. It was the sixth state,in value of common brick, fifth in the value of front and fancy brick, third in the production of sewer pipe and sixth in the value of fire brick.

In no other part of the world is so great a variety of crops brought to so high a state of development. Over the greater portion of the agricultural area the crops of both the temperate and the subtropical zones can be grown at will with equal success. The earlier agricultural period was characterized by the great predominance of wheat raising.

California is the chief beet-sugar producing State in the Union. The general character of agriculture in the State is indicated by the fact that in 1909 somewhat less than one-fifth of the total value of the crops was contributed by cereals, less than one-third by fruits and nuts, and more than one-fourth by hay and forage, the remainder, representing 22.2 per cent of the total, consisting mostly of potatoes and other vegetables. The production of citrus-fruits has become one of the chief industries of the State. California provides about 40 per cent of the total orange supply of the world, and three-fourths of the total production of the United States. The total number of fruit trees of all kinds of fruit in California in 1909 was 30,895,257 and of these 22,484,195 were bearing. The orchard fruits are produced in large quantities. The total production in 1909 was 31,502,000 bushels, valued at $18,359,000. Agriculture and Mining are the principal industries, but the natural resources of the State give rise to several important industries, such as the lumber industry, canning and preserving, flour and grist milling, petroleum refining, the refining of beet-sugar, the wine industry and the manufacture of cement.

CALIFORNIA

Representative area used as a basis for study.

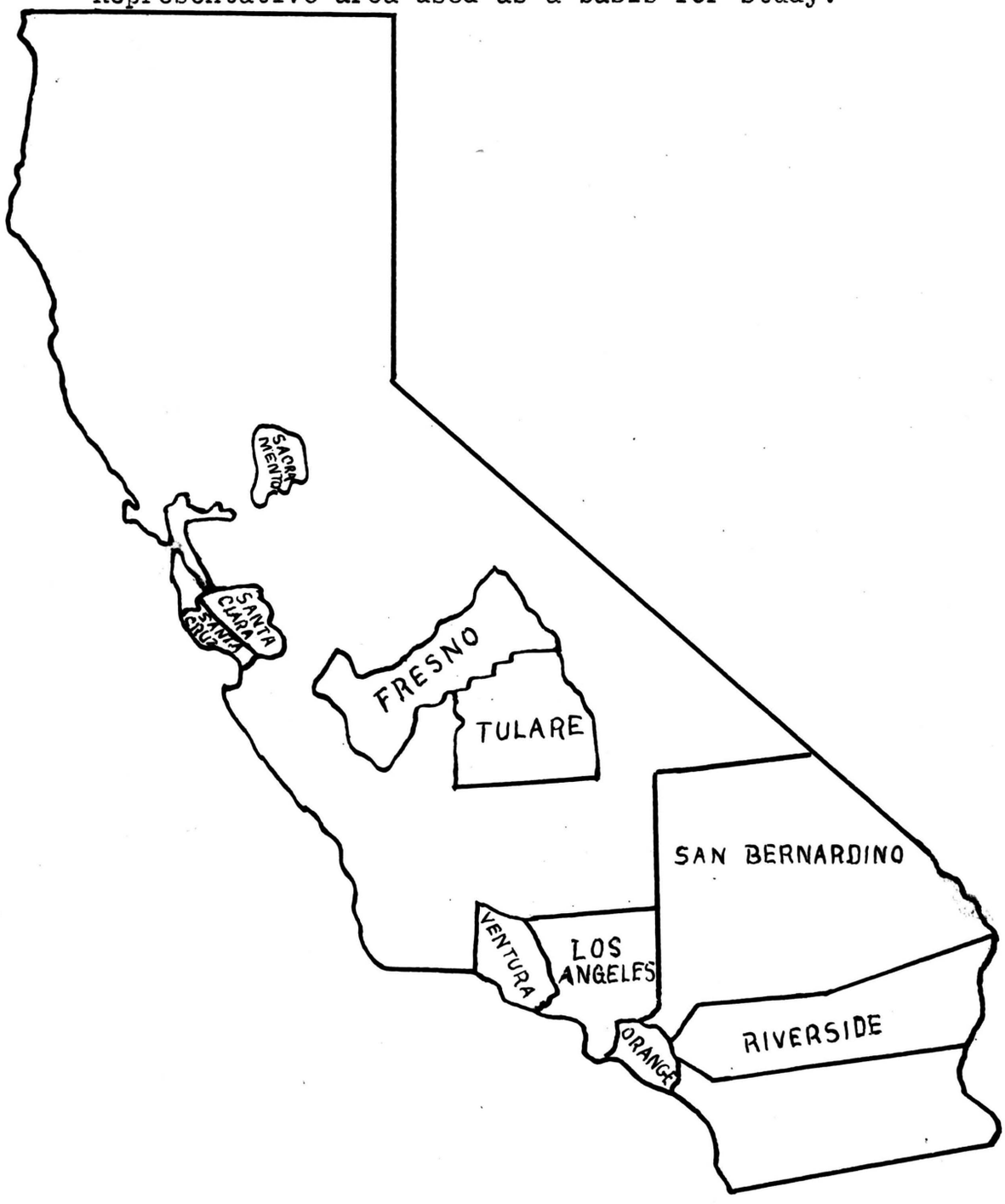

Fig.6 - Map of California, showing the location of the ten counties (including 36078 farms) used in getting the average data.

Kind of People.

The farmers of California are more progressive and co-operate more than the farmers of Missouri, Illinois or Kansas. The fruit Association is the largest farmers co-operative organization in the United States. The farmers are compelled to co-operate more, probably in California because of the necessity in irrigation and in order to dispose of their fruit, due to so great a distance from market.

In 1910, 54.2 per cent of all land in farms was in farms operated by their owners, 23.6 per cent in farms operated by managers and 22.2 per cent in farms operated by tenants. The average size farms operated by managers in 1910 was 1,933 acres, by tenants 341.7 acres; by owners 227 acres. More than two-thirds (66.8 per cent) of the California farmers were native whites and about three-tenths (29.7 per cent) foreign-born whites. Only 3,078 or 3.5 per cent of all farmers were non-whites. Of these 1,816 were Japanese, 591 Chinese and 159 negroes. Of the native white farmers 17.8 per cent were tenants; of the foreign-born white 21.2 per cent, and of the non-white 67.5 per cent were tenants.

Type of Farming.

California has a fruit type of farming. The total quantity of orchard fruits produced in 1910 was 31,502,000 bushels, valued at $18,358,000. Plums and prunes, peaches and nectarines, apples, and apricots are the most important of the orchard fruits. The total value of the tropical fruits produced in 1910 was $16,752,000 the value of oranges representing more than three-fourths of the total, and the value of lemons being next in importance. The production of grapes in 1910 amounted to 1,979,687,000 pounds, valued at $10,847,000 and the production of nuts was 28,378,000 pounds, valued at $2,960,000. The value of all orchard fruits produced in California increased from $14,527,000 in 1899 to $18,359,000 in 1910; the value of tropical fruits increased from $7,219,000 in 1899 to $16,752,000 in 1910, and the grapes from $5,623,000 in 1899 to $10,847,000 in 1910.

The following table gives the principal crops, other than fruit and nuts, the production, acreage and value for 1913.

Table - XII.

Crop	Acreage	Bushels Produced	Value.
Corn	55,000	1,815,000	$1,597,000
Wheat	300,000	4,200,000	3,990,000
Oats	210,000	6,636,000	3,782,000
Rye	8,000	120,000	90,000
Potatoes	68,000	8,092,000	5,664,000
Hay	2,400,000	3,600,000	48,600,000
Cotton	17,000	18,000	1,119,000

Barley?

Table - XIII.

Receipts from sale of feedable crops 1910.

Crop	Quantity Sold	Amount Received
Total		$21,329,523
Corn	352,548 bushels	294,777
Oats	2,192,824 "	1,417,410
Barley	14,106,453 "	9,427,240
Hay and Forage	926,123 tons	10,190,101

These are the principal crops sold besides the fruit and wheat crops. California being a fruit State, sells but little of cereal and forage crops.

Soil and Topography.

The soils bordering the rivers, are usually heavy clays and clay loams, constituting the overflow land and river flood plains. These are bordered along the foothills by loams, sandy loams, and sandy and gravelly soils, giving great variety in soil characteristics and in resultant crop adaptation. In the extreme southern portion of the State, is the deep arid valley, some portions of which are below sea level. The soils are clays, sands, and sandy loams.

The topography of this immense State is strikingly varied, but broadly stated, consists of two parallel mountain ranges extending north-west and south-east, inclosing between them a very extensive valley, in addition to which is included in the east, a part of the Great Basin.

Climate and Rainfall.

No state of the United States indeed few of the most favored countries of the world can boast of so delightful a climate as that of the valley lands of California. Low winds velocities and high percentage of sunshine are striking features. The average mean temperature at San Francisco is 51°, summer 60°, and winter 49°. The air is mild, the sky clear and the landscape gay with flowers.

Rainfall - Two seasons, the wet and the dry, divide the year. The first so called because it is the only period during which it rains, though rains are not continuous and the average fall for the State, 23 inches, is less than at Chicago or St.Louis. The rainfall amounts to more than 75 inches annually on the windward slopes of the Sierras. Precipitation is light in the Great Valley and east of the Sierra Nevadas, often not exceeding 3 inches a year. The wet season lasts from about the middle of November till April or May. Irrigation has to be resorted to in some sections, because of light precipitation in the lowlands, except in the case of grain crops, deciduous fruits and grapes.

Indebtedness.

The average value per farm was $11,675 and the average debt per farm was $2,802 in 1910.

Definition of Terms.

Capital includes the value of all farm property, land, houses, buildings, stock, feed, seed, tools and cash necessary to keep the farm running. It does not include house furnishings that are not used in farming. The average of the amount at the beginning and at the end of the year is considered to be the capital invested in the business.

Receipts include all money received from the sale of any farm products, also receipts from outside work, rent of buildings, etc. If the value of the buildings, stock, produce, or equipment is greater at the end of the year than at the beginning, the difference is considered a receipt.

Expenses include all farm expenses. If the value of the buildings, stock, produce, or equipment at the end of the year is less than at the beginning, this less is included with expenses. Household or personal expenses are not included, but the value of board furnished to hired help is counted. Expenses, therefore, include all business expenses.

Farm income is the difference between receipts and expenses. This is the net return as a result of the use of the capital and unpaid labor. It does not represent what the farmer earned, because both the farmer and his money were working. In order to see what was produced by the unpaid labor, we must subtract the amount that the capital would have earned if placed at interest.

Labor income is the farmer's net return after paying from his gross income all general running expenses, including also interest at 5 per cent, depreciation , and wages for hired men and members of his family, but excluding household expenses.

An Animal Unit is a cow, horse or seven mature sheep, or five mature hogs. Seven mature sheep or five mature hogs are considered to be equal to one horse on the basis of feed consumed and manure produced. Two young animals are regarded as equal to one mature animal.

A Productive Work Unit is a 10 hour day productive labor done by either a man or a horse. Productive work includes work on live-stock, on farm crops, or on the improvement; but not on the repairs of fences, buildings and machinery, work-stock or on anything else included in the maintenance of the farm.

A Crop Index of 85 means that the yield per acre of all crops is 85 percent as great as the average yield of the region. The average is taken as 100. Therefore a crop index of 85 means that the yields are 15 percent lower than the average.

Farm Area means the total area of the farm including pasture and waste lands.

Crop Area means the land in crops.

Working Capital includes the money invested in live-stock and machinery and tools.

Use of Capital.

Amount of capital. The three economic agencies which agriculture demands, are land, labor, and capital. The adjustment of these agencies in the right proportion is an important phase of successful farm management. Capital is the most important of the three primary agencies needed by the farmer; especially is this true of the Missouri farmer. The farmer with little, or no capital must confine himself to practices that will pay each year, while the man with considerable means, is free to follow those more expensive methods which pay best in the long run. To carry on any business there must be a sufficient amount of capital. To secure the necessary farm machinery and live-stock to operate a farm, requires considerable capital. It is difficult to make reasonable wages, if the capital is too small. With a sufficient capital, it seems to be much easier to make both interest on the capital, and pay for the farmer's time. The American farmer has had little experience in handling capital and in general, the farmers are not competent to properly engineer a big business. It is as dangerous to over capitalize a farm as it is to have too small a capital.

Table - XIV. The Amount of Capital Invested, With Labor Income.

Region	Land	Buildings	Live-stock	Machinery & tools	Total Invest- ment per farm	Average labor income
Ill.	$24,030.30	$2233.50	$1615.70	$428.40	$28312.10	$ 74.63
Ala.	751.80	222.60	229.60	52.10	1260.40	243.81
Iowa	15130.00	2413.20	2082.40	468.90	20094.80	352.75
Mo.	10059.90	1510.00	1697.45	263.69	13528.90	403.55
Kan.	11374.91	1279.00	1639.10	354.20	14642.90	797.92
Cal.	17586.60	1559.30	1040.10	448.60	20635.60	1226.93

This fact is noticeable in the labor income, the farmers received on the high priced land in Illinois as compared to the labor income received by the farmers of Alabama on cheap land. In table XIV the average amount invested in land in Illinois per farm was $24,030. - With a labor income of $74. While with Alabama the average amount invested in land per farm was $751. with a labor income of $243. The higher the price of land, beyond a certain sum, the more skill and technique is necessary in managing the farm, to make a given profit.

Distribution of capital. It is not sufficient in successful farming to merely have an adequate amount of capital, but this capital must be properly distributed in land equipment and live-stock. The proportion of capital to be invested in land, stock and equipment, varies with the price of land and stock as well as with the type of farming.

Table - XV. Distribution of Capital and Labor Income.

Region	Land	Buildings	Live-stock	Machinery and tools	Total per cent	Average labor income
	per cent	per cent	per cent	per cent		
Ill.	84.78	7.95	5.76	1.51	100	$74.63
Ala.	59.69	17.76	18.32	4.23	100	243.81
Iowa	75.21	12.10	10.36	2.33	100	352.75
Mo.	74.36	11.16	12.54	1.94	100	403.55
Kan.	77.67	8.73	11.19	2.41	100	797.92
Cal.	85.22	7.56	5.04	2.18	100	1226.93

Table XV shows that Illinois has 84.78 per cent invested in land and only 5.7 per cent in live-stock; 1.5 per cent invested in machinery and tools, with $74.63 as labor income, while Alabama has 59.69 per cent invested in land, 18 per cent in live-stock and 4 per cent in machinery and tools, with a labor income of $243.81 Alabama therefore has the best labor income because Illinois has too much money invested in land, and not enough in productive live-stock. The farmers of Alabama have 18 per cent of their farm capital invested in productive live-stock. The per cent invested in machinery and tools ranges from 1.5 in the corn section to 4.2 in the cotton section. The Alabama farmers have a much greater per cent of their capital invested in buildings and in machinery and tools than the other regions. This is due to the fact that the farms in Alabama are small. The machinery that is used to cut only 15 or 20 acres of grain in Alabama, is used to cut 50 to 60 acres in Missouri. The same thing is true with the buildings, for instance in Alabama, a barn may be used to store only 10 tons of hay, while in Missouri practically the same barn would be

used to store 20 tons of hay, at very little more cost. The small farms have too much overhead charges for buildings and equipment, The farmers in Kansas have 2.4 per cent of their capital invested in machinery and tools, while Illinois farmers have only 1.5 per cent of their capital invested in machinery and tools. This difference is due to the fact that the Kansas farmers have much larger farms, and use larger machinery than the farmer of Illinois.

Table XVI shows that the distribution of capital in the United States for 1910 was as follows,- 70 per cent of the capital invested in land; 15 per cent in buildings; 12 per cent in live-stock and 3 per cent invested in machinery and implements, while for Missouri in 1910, table XV, the figures show investment in land 74 per cent, buildings 11 per cent; live-stock 12 per cent and machinery and tools 1.5 per cent.

Table - XVI. Average Capital and Its Distribution Per Farm in the United States.

	1900		1910	
Land Exclusive of Buildings	$2285,	64%	$4476.	70%
Buildings	620.	17%	996.	15%
Implements and Machinery	133.	4%	199.	3%
Live-stock	536.	15%	774.	15%
Total	$3574.	100%	$6444.	100%

Warren's Farm Management, Page 295.

In table XVI from 1900 to 1910 the per cent invested in land increased from 64 per cent to 70 per cent, while the per cent invested in buildings and machinery & tools decreased, (buildings 4 per cent to 3 per cent.)

The total value of capital per farm increased from $3574 in 1900 to $6444 in 1910. This shows a remarkable increase in the capital invested per farm in the United States.

Table - XVII.- Average Value of Farm Property Per Farm in the United States. 1850 - 1910.

Year	Real Estate	Implements & Machinery	Live-stock	Total
1850	$2258	$105	$376	$2739
1860	3251	120	533	3904
1870	2799	102	462	3363
1880	2544	101	393	3038
1890	2909	108	506	3523
1900	2905	133	536	3574
1910	5471	199	774	6444

This table shows that the average capital invested in real estate in the United States in 1850 per farm was $2258. and $5471 in 1910. The investment in machinery increased from $105 in 1850 to $199 in 1910 and live-stock from $376 per farm in 1850 to $774. per farm in 1910. The largest increase has been in land and live-stock.

Relation of Capital to the Type of Farming. Stock farming necessitates the outlay of considerably more capital than does grain farming. The money invested in live-stock is not the only factor calling for larger investment, as more and better buildings are required and the employment of more and better quality of labor is essential.

Primarily the equipment of a stock-farm naturally depends on the kind of stock to be kept, and the use to which the stock is put. The equipment of a farm devoted to growing swine in the Middle West may be very simple indeed, while the equipment needed to conduct successfully,a farm devoted to fine horses or to dairy cattle, would naturally be much more complex and costly.

It is poor economy on the part of the farmer to live in a small, unsanitary house with no conveniences; to house his horses in sheds or barns which furnish little protection from the weather; to leave his machinery and tools unhoused; to have insufficient granaries and cribs and thus be under the necessity of marketing his grain at harvest time. In general, persons who have small capital, put most of their effort into raising crops to sell, rather than in raising much live-stock, because live-stock calls for additional investment above that required in crop production.

Grain farming does not demand so much capital as live-stock farming.

Table XVIII.- The Investment of Capital Used by Farmers Receiving Different Labor Incomes.

Region	Average size farm	Average value per acre.				
		Land	Buildings	Live-stock	Machinery and tools	Total invest-ment per acre
Ill.	160.	$150.29	$13.95	$10.10	$2.67	177.01
Ala.	61.	12.32	3.64	3.76	.85	20.57
Iowa.	150.	100.70	16.	13.80	3.12	133.62
Mo.	140.	70.51	10.70	12.12	1.88	95.21
Kan.	246.	47.21	5.10	6.66	1.43	60.40
Cal.	190,	118.67	8.20	5.40	2.36	134.63

Table XVIII shows the relative investment in land, buildings, live-stock and machinery and tools per acre for the different types of farming. Iowa, the live-stock section, has considerably more invested per acre in buildings,live-stock, machinery and tools than any of the other sections. Iowa and Illinois have too large an investment in buildings. A live-stock farm should have a deep fertile soil in order to raise an abundance of feed. Iowa has $16. invested in buildings for every acre, $13.80 per acre for live-stock and $3.12 per acre for machinery and tools, while Missouri, a diversified section, has $10.70 invested per acre for buildings,

$12.12 per acre for live-stock and only $1.88 per acre for machinery and tools. Kansas as a wheat section, and California as a fruit section, both have considerably less invested per acre in land, buildings and machinery and tools than Iowa.

The total investment per acre is considerably more with the live-stock farming (Iowa section) than in the other types of farming except in the corn section of Illinois. The farmers of Iowa have invested per acre $133.72; while in Illinois the farmers have invested $177.01 per acre, but the land in Illinois is higher priced, due partly to its location, near the big markets, Chicago and St.Louis.

Relation of Capital to Labor Income. The capital available is becoming increasingly important in farming. Because of shortage in capital 37 per cent of the farmers in the United States rent the land that they operate, and 9 per cent own part and rent part of their land. Only a little over a half (54 per cent) of the farmers own their entire farms. Of the farmers who own all or part of their land, 34 per cent are mortgaged. Only 36 per cent of the farmers own all the land that they operate and are free from mortgage. Very few farmers who use less than $5000 worth of capital are making average hired man's wages. With a fair amount of capital, it is easier to make wages and interest on the larger capital than to make wages and smaller interest on a small capital.

The capital need not all be owned. Tenants and part owners often do well because with a given capital they have a larger business. A tenant who has $3000 may rent a farm worth $15000 and be running a business many times larger than can an owner who has only $3000. Any factor that enables the farm operator to get control of more capital results in much larger profits on the average, provided the capital is properly distributed. It has often been said, "The larger the capital, the more the profit"; but this is not true unless the capital is properly handled and distributed.

Table XIX.- Capital in its Relation to Labor Income.

Region	Average size of farm.	Total Investment per farm.	Average labor income.
Ill.	160	$28,312.	$74.63
Ala.	61	1,260.	243.81
Iowa	150	20,094.	352.75
Mo.	140	13,528.	403.55
Kan.	246	14,642.	797.92
Cal.	190	20,635.	1226.93

In table XIX Illinois has the largest investment per farm ($28,312) and the smallest labor income $74.63

This table shows that the largest investment does not mean the largest labor income.

Iowa has $20,094 invested per farm, with a labor income of $352 while Missouri has $13,528 invested per farm with $403 as labor income. Missouri has $6566 less invested per farm than Iowa, but makes a $51.00 larger labor income. In like manner, Kansas farmers have invested per farm $1114 more than the Missouri farmers but make very nearly twice the labor income. These differences are due to larger farms, cheaper land, less money invested in buildings per acre and the better use of farm machinery.

More Capital Necessary than Formerly. Considerably more capital is now required than formerly for successful farming. The land is high in price; more and better machinery is used; and this calls for more acres to keep it busy. In the early days, with land low in price, pasturage abundant, and feed and labor cheap, making a profit from live-stock, farming and grain farming was comparatively easy, even tho one possessed little knowledge of the principles governing the science in the operation. Conditions have now changed. Thruout the United States the fertile land has advanced in price and no less marked has been the increase in the cost of labor and of feeding stuffs. However, present conditions call for a more intelligent type of farming than has ruled in the past. Good profits are possible today only, when all the operations are planned intelligently and with good judgment, and there is a thoro appreciation of the requirements necessary for successful farming.

The increase in the price of land, buildings and machinery can be illustrated by table XX, showing the progress made in Missouri between 1900 and 1910. There was an increase of 186,670, or 6 per cent, in the population of the State, while there was a decrease of 7,642, or 2.7 per cent, in the number of farms. There was an increase of 1.7 per cent in the area of farm land, while the improved land in farms increased 7.3 per cent, and the average size of farms rose from 119.3 to 124.8 acres.

The following table summarizes for the State the more significant facts relating to population and land area, the number, value, and acreage of farms, and the value of all other farm property in 1910 and 1900.

Table XX.-

NUMBER, AREA, AND VALUE OF FARMS.	1910 (April 15)	1900 (June 1)	Per cent increase
Population	3,293,335	3,106,665	6.0
Number of all farms	277,244	284,886	-2.7
Approximate land area of State ---- acres -	43,985,280	43,985,280	------
Land in farms ---- acres -	34,591,248	33,997,873	1.7
Improved land in farms, " -	24,581,186	22,900,043	7.3
Average acres per farm	124.8	119.3	4.6
Value of farm property:			
Total	$2,052,917,488	$1,033,121,897	98.7
Land	1,445,982,389	695,470,723	107.9
Buildings	270,221,997	148,508,490	82.0
Implements and machinery	50,873,994	28,602,680	77.9
Domestic animals, poultry, and bees	285,839,108	160,540,104	78.0

Table XX - (Continued)	(1910)	(1900)	per cent increase
Average value of all property per farm,	$7,405	$3,626	104.2
Average value of land per acre,	$41.80	$20.46	104.3

"Farm property,which includes land, buildings, implements and machinery, and live-stock, (domestic animals, poultry,and bees) has increased in value during the decade,over a billion dollars, or about doubled. This increase is made up of increases of $121,714,000 in the value of buildings, of $750,512,000 in the value of land, and of $147,570,000 in the value of farm equipment, including implements and machinery and live-stock, of which more than five-sixths represents a gain in the value of live-stock and the remainder, the increase in the value of implements and machinery. In considering the increase of values in agriculture the general increase in the prices of all commodities in the last 10 years should be borne in mind. The average value of a farm in Missouri with its equipment in 1900 was $3,626, while 10 years later it was $7,405."

(1910 Census, Page 892.)

The average value of land in Missouri rose from $20.46 per acre in 1900 to $41.80 in 1910, this advance being accompanied by increases in the average value per farm of buildings, implements and machinery, and live-stock.

Relation of Capital and Cash Crops to Labor Income. Table XXI shows that with small capital those who depend largely on cash crops, make the best labor income. This fact is shown by Alabama's making $243. labor income with 91 per cent of receipts from crops. The farmers of Alabama with the size of their farms, and the amount of capital invested, are not able to keep productive live-stock, so they put the most of the land in cash crops.

Table XXI.- Relation of Capital and Cash Crops to Labor Income.

Region.	Average capital.	Average labor income.	Per cent of receipts from crops.	Per cent of receipts from stock & stock products.
Ill.	$28312.	$74.	63.92	36.08
Ala.	1260.	243.	91.09	8.91
Iowa.	20094.	352.	18.94	81.06
Mo.	13528.	403.	14.51	85.49
Kan.	14642.	797.	48.80	51.20
Cal.	20635.	1226.	86.36	13.64

The types of farms like those of Missouri and Iowa, with larger capital, do best with 18 to 48 per cent of their income from crops. Missouri farmers receive $403 labor income, with 14.5 per cent of income from crops, while Kansas farmers receive $797 labor income, with 48 per cent of the income from crops.

Kansas farmers receive 48.8 per cent of their income from crops and 51.2 per cent from live-stock with a labor income of $797. While Illinois farmers receive 63.9 per cent of their income from crops and 36. per cent from live-stock with a labor income of $74. Illinois farmers have too much money invested in real estate. The fruit farmers of California receive 86. per cent of their income from crops and 13.6 per cent from stock and stock products. It is very necessary that this type of farming receive most of its income from cash crops. The per cent of cash crops necessary to make a good labor income depends upon the type of farming and the location. If the farmer is free of debt, thereby having no interest to pay, he will have in addition to his labor income the interest on his investment to use for living and savings.

Table XXII.-Average Capital,Receipts,Expenses and Labor Income.

Region	Average capital	Total receipts	Total expenses	Farm income	Labor income	Per cent on investment.
Ill.	$28312.	$2042.45	$502.41	$1490.23	$74.	5.26
Ala.	1260.	410.86	104.02	306.83	243.	24.3
Iowa	20094.	1850.78	493.30	1357.48	352.	6.75
Mo.	13528.	1508.50	428.50	1080.	403.	7.98
Kan.	14642.	2029.50	499.43	1530.	797.	10.44
Cal.	20635.	3329.97	1052.69	2277.27	1226.	11.03

Table XXII shows the per cent realized on the investment per farm for different types of farming. In Illinois the farmers received 5.26 per cent on the capital invested per farm. Allowing 5 per cent for interest leaves only 0.26 per cent ($74.) which is the income for his labor and for profit. Thus the farmers of Illinois on the richest land in the world are living on the interest of their investment and are not realizing the income they should, from their labor. The farmers of the cornbelt state are making less than 6 per cent on their capital and receive no compensation from their labor, except a living. This sort of business is not very profitable. The largest profits cannot be made on a small business, yet there are many farmers on small farms who do fairly well. About the only small farm that pays is the highly intensified truck farm, near a good market.

The farmers of Iowa make 6.75 per cent with a labor income of $352. These farmers are not making any greater labor income than the average farm-hand.

WORKING CAPITAL. Labor is the one factor in the farm business that is very frequently lacking. Few farms are utilized to their most profitable capacity. The labor problem deserves much careful study. Among the farms previously mentioned, those which show greatest profit,generally show also the largest outlay for labor. To urge that the farm should be utilized to its full capacity, does not mean that every farm must be turned into a truck farm in order to employ more labor. It does mean that enough labor should be provided to make full use of the farm consistently with the type followed. Greatly increased cost in the care of the crop, and greatly diminished returns, due to the lack of labor to do things at the right time, are almost a constant experience on many farms. The cost of tillage in any hoed crop may be more than doubled by a few days of neglect; the returns at the same time may be cut in half. The margin whereby one man's production exceeds the cost of his services cannot be large.
To develop a large and successful business, demands that such margins from the labor of a number of men shall be combined. Ready money is in constant need, to pay for labor and to conduct the regular operations of the farm.

Thousands of farmers are hampered,for the lack of working capital, and lose each year far more than the interest charge would be on the capital needed for this purpose. Money is frequently needed to embrace special opportunities in the purchase of stock, equipment and supplies. The forms of capital that need most careful guarding,are those less stable forms of working capital,beginning with ready money and those phases of the equipment or business for which it is most likely to be needed. Permanent forms of invested capital are less likely to be neglected. The greater the competition, the greater, as a rule, will be the demand for working capital.

Table XXIII.- Working Capital, Its Per Cent of Total Investment and Labor Income.

Region.	Average size.	Average working capital.	Average capital per farm.	Average labor income.	Per cent working capital to total investment.
Ill.	160	$2044.	$28312.	$74.	7.21
Ala.	61	281.	1260.	243.	22.3
Iowa.	150	2551.	20094.	352.	12.6
Mo.	140	1961.	13528.	403.	14.4
Kan.	246	2003.	14642.	797.	13.6
Cal.	190	1488.	20635.	1226.	7.21

Table XXIII shows that the per cent of working capital to total investment is 7.2 in Illinois and 22.3 per cent in Alabama.

Because of the small size of the farms in Alabama, the per cent of working capital to total investment is high.

California, the fruit section has 7.2 per cent of total capital invested as working capital; the same as Illinois, but California is a fruit section and does not need to have so much invested in buildings, live-stock and machinery and tools, as does a live-stock or grain region. Iowa and Kansas have less invested as working capital; (12.6 per cent and 13.6 per cent respectively) than Missouri (14.4 per cent).

Missouri has smaller farms than Iowa and Kansas, so the per cent invested as working capital would be greater.

Kansas farms have more (13.6 per cent) invested as working capital than Iowa (12.6 per cent) because the farms of Kansas are much larger than the farms of Iowa, and for this reason the farmers of Kansas use much bigger farm machinery.

As a rule the larger the working capital the greater the labor income. There is known to be a close relation between the working capital, and the profits from farming. Observations show that the farmers who reserve sufficient capital to employ help when it can be used to advantage, or to buy equipment for some specific purpose of production, or to permit of stock feeding or of business transaction when conditions appear to be favorable, are usually more prosperous than those who invest so much of their money in land, buildings and other fixed forms that they are short on working capital.

Size Of Farms.

RELATION OF THE SIZE OF THE FARM TO LABOR INCOME.

The size of the farm business is quite significant of the farm profits. The size of the farm has a very important relation to the efficiency of the farming business and the most economical methods of handling the farm operations. For the greatest efficiency and profits; a farm should be large enough to fully employ at least two men, the entire year. One man is at a great disadvantage in many farm operations, and in case of sickness or other emergencies, the disadvantage is still greater. These disadvantages and hindrances have a marked effect on the profit. It is poor business to have some crop going to waste for the want of attention. The size of the farms in the United States has been decreasing. This is shown by the following table.

Table XXIV.-Average Size of Farms in the United States.

	Average Area per Farm.	Average Improved Area per Farm.	Average Area in Principal Crops.
1850 - - - - - - - - -	203	78	- - - -
1860 - - - - - - - - -	199	80	- - - -
1870 - - - - - - - - -	153	71	- - - -
1880 - - - - - - - - -	134	71	41
1890 - - - - - - - - -	137	78	47
1900 - - - - - - - - -	147	72	47
1910 - - - - - - - - -	138	75	46

Warren's Farm Management, Page 240.

Table XXV.- Size of Farm and Labor Income.

Region	Average Size of Farm.	Value of Land per acre.	Average Labor income.
Ill.	160	$150.29	$74.63
Ala.	61	12.32	243.81
Iowa.	150	100.70	352.75
Mo.	140	70.51	403.55
Kan.	246	47.21	797.92
Cal.	190	118.67	1226.93

Table XXV shows that Kansas and California, with the largest size farms (altho with different types of farms and with wide differences in price of land), make the best labor incomes. Illinois with 160 acre farms, has a smaller labor income than Alabama with 61 acre farms, but this difference is due to the extreme high price of land in Illinois and very cheap land in Alabama. Iowa and Missouri have about the same size farms, but the Iowa land is about $30. higher in price per acre, which makes a slight difference in the labor income.

The farmers of Kansas operate 246 acre farms and receive $797.92 as labor income, while the farmers of Missouri operate 140 acre farms and receive $403.55 as labor income.

SIZE OF FARMS AND LABOR EQUIPMENT. The efficiency with which the various sizes and types of farms uses labor and equipment is shown in table XXVI. The most striking differences in the effective use of labor and equipment are due to size of the farm business. The farmer who has a good size business with large fields, convenient farm buildings and properly fitted with machinery has a big advantage over the farmer with a small farm. The type of farming limits the efficiency in the use of labor.

Table XXVI.- Size of Farms and Labor Equipment.

Regiom	Average size	Crop acres per		
		Man	Horse	$100 Equipment
Ill.	160	83.2	16.5	29.3
Ala.	61	26.7	22.7	55.5
Iowa.	150	82.4	16.3	22.9
Mo.	140	67.1	14.8	33.2
Kan.	246	101.	20.3	41.9
Cal.	190	25.2	16.9	16.3

Table XXVI shows that the crop acres per man varies with the size of the farms; for instance, Illinois with 160 acre farms has 83.2 crop acres per man, while Iowa with 150 acre farms, has 82.4 crop acres per man,and Missouri with 140 acre farms has 67.1 crop acres per man. Kansas has 246 acre farms which furnishes 101 crop acres per man, While California, a fruit section has 190 acre farms with 25.2 crop acres per man.

The fruit type of farm furnishes more labor and therefore a man is not able to handle so many crop acres. With horse labor, the number of crop acres vary with the size of the farm. The small farms furnish fewer crop acres per horse than large farms. The cotton type of farming shows exceptional results in the crop acres tended per horse. The small cotton farm furnished 22.7 crop acres per horse while the large farms of Kansas furnish 20.3 crop acres per horse. On the small cotton farm one horse did all the work. The crop acres per horse for the various types of farmimg are as follows; Missouri the diversified type, 14.8; Iowa, the live-stock region, 16.3; Illinois, the corn belt, 16.5 and California, the fruit type of farming, 16.9. In Kansas for each 41.9 crop acres, there is invested $100 in machinery while in Alabama there is $100 invested in machinery for each 55.5 crop acres. This indicates that the small cotton farm does not require so much machinery as the wheat type of farming.

SIZE OF FARMS IN RELATION TO PRODUCTIVE WORK UNITS. Table XXVII shows some important facts concerning the size of farms and productive work days in relation to the different types of farming. For each type of farming, data from thousands of farms were used in getting the average figures in table below.

Table XXVII.- Size of Farm in Relation to Productive Work Units.

Region	Average size	Work units	
		Per man	Per horse
Ill.	160	195.8	49.4
Ala.	61	263.6	122.0
Iowa.	150	225.7	43.7
Mo.	140	189.1	41.6
Kan.	246	231.0	59.5
Cal.	190	199.2	56.1

Some interesting things are shown in table XXVII concerning the cotton farming in Alabama. The cotton type of farm is a one-man, one-horse farm. It is quite striking that a 61 acre Alabama cotton farm supplies 263.6 productive work days per man and 122 productive work days per horse, while Illinois with 160 acre farms, furnishes in productive labor only 195.8 days per man and 49.4 days per work horse. The problem of winter labor is more difficult in Illinois, because in Alabama the climate is so that the farmer can have various crops to supply labor thruout the year. Iowa, Missouri, and Kansas do not differ very greatly in amount of labor supplied per man and per horse. With the exception of Alabama region, the productive work days per man and per horse vary with the size of the farm. The average productive work days done by a work horse in Illinois is 49.4 While in Kansas the average work horse has 59.5 productive work days to his credit. This shows that Kansas with the larger farm, uses horse labor more efficiently.

Kansas farms furnish considerably more labor per man and per horse than Missouri farms. This helps to explain why the farmers in Kansas have so much larger labor income.

SIZE OF FARM RELATED TO CROP YIELDS. Table XXVIII shows that the larger farm has the best yields. Illinois with a 160 acre farm, has a crop index of 113.17 While Alabama farmers with 61 acre farms have a crop index of 89.82.
The crop index is the average yield of all crops in terms of per cent.

Table XXVIII.- Size of Farm Related To Crop yields.

Region.	Average size.	Crop index %	Average Labor Income.
Ill.	160	113.17	$74.63
Ala.	61	89.82	243.81
Iowa.	150	113.59	352.75
Mo.	140	113.1	403.55
Kan.	246	113.39	797.92
Cal.	190	118.45	1226.93

The crop yields in Illinois, Iowa, Missouri, Kansas and California do not vary a great deal as to the average crop yield, as shown by the crop index, but these different regions differ as to the yield of separate crops which will be shown in the following table. The farmers of California make on the average slightly higher yields than Kansas farmers, altho the farms in Kansas are much larger than those in California.

There is a little more intensive farming in California than in Kansas, and a much better climate and more favorable conditions. Poor crops that do not pay the cost of production, and the feeding of these to unproductive live-stock, are common causes of failure. This characteristic of unsuccessful farming attracts much public attention. The farmer may have sufficient area and grow the right kind of crops, yet not be successful, unless he secures good yields.

Table XXIX.- Size Of Farms In Relation To Crop Yields.

Region	Average size	Corn	Wheat	Oats	Hay
Ill.	160	39.2 Bu.	17.98 Bu.	36.2 Bu.	1.26 Tons.
Ala.	61	12. "	cotton 151.4 lbs.	12.6 "	1. "
Iowa.	150	36.9 "	15.3 Bu.	27.6 "	1.5 "
Mo.	140	26.9 "	14.8 "	23.1 "	1.1 "
Kan.	246	19. "	13. "	24.6 "	1.73 "
Cal.	190	24.9 "	13.1 "	21.5 "	2.91 "

Table XXIX shows that the corn yields are much better in Illinois than in any of the other sections. Illinois has an average yield of 39.2 bushels of corn per acre, while Alabama has 12 bushels of corn per acre. This difference in yield of corn in Illinois and Alabama is due to different soil, climate and type of farming. The high yields in Illinois bear testimony to the fertility of the soil.

Kansas has a comparatively low yield of corn, because of the low rainfall and poor distribution of it. Wheat is the principal crop in Kansas, altho the yield is rather low. Iowa has better yields of grain crops than Missouri, Kansas or California because the soil in Iowa is more fertile and better for these particular crops. The yield of hay is much better in California than with the other types of farming.

RELATION OF THE SIZE AND TYPE OF FARMS, TO THE EFFICIENCY IN THE USE OF LABOR. The producing enterprises on the farm are the acres of crops grown, and productive animals. The acres of crops grown, the yields of these crops, and the number of producing animals are a measure of the amount that is being accomplished on a farm.

Table XXX.- Relation of the Size and type of Farms, to the Efficiency in the use of Labor.

Region	Average acres of crops.	Average number of animal units except work horses.	Acres of crops per man.	Animal units except work horses per man.	Average number of men.
Ill.	125.66	12.38	83.27	8.25	1.51
Ala.	28.9	2.29	26.75	2.12	1.08
Iowa	107.22	25.79	82.47	19.83	1.30
Mo.	87.33	16.62	67.17	12.78	1.30
Kan.	148.5	16.06	101.	8.09	1.47
Cal.	73.	11.64	25.25	4.02	2.89

Table XXX shows some interesting facts as to the efficiency of the various types of farms in relation to size of business.

A man in Illinois accomplishes more than a farmer in Alabama; because in Illinois one man handles 83.77 acres of crops and 8.25 animal units, while the Alabama farmer only cares for 26.75 acres of crops and 2.12 productive animals.

There is a big difference in what the two men actually accomplish. The Illinois farmer has 125.66 acres of crops with an average of 1.51- men per farm, while the Alabama farm has only 28.9 acres of crops, with an average of one man per farm. This shows that the Illinois corn type of farming is more efficient in the use of man labor than the cotton type of farm in Alabama.

The live-stock type of farming in Iowa furnishes 82.47 acres of crops and 19.83 animal units per man. More efficient labor is performed per man on the live-stock type of farm than on the corn-belt farm; as the Iowa farmer supplies the labor for not only about as many acres of crops, but renders more than twice the labor on live-stock than the corn-belt man. In Kansas the crop acres per man are much greater, going as high as 101. This is due to the large labor saving machinery used in Kansas. The labor rendered in the care of live-stock in Kansas is about the same as that for Illinois. The fruit farmer of California does not handle very many crop acres (25.25) nor put in much labor on live-stock. Fruit farming requires considerable labor per acre which does not allow so much time for the crops other than fruit. The farmers of Alabama and California keep very little live-stock, which is a very important source of income.

Table XXX shows that the most efficient labor is obtained on the large farms like Kansas with 246 acres, where bigger machinery is used. The amount of labor a man is able to render depends upon the type of farming practiced and the size of the farm. The cotton and fruit types of farms are usually small because one man cannot handle successfully, very many crop acres and also this type of farm does not lend itself to the use of large farm machinery.

Table XXXI.- Size and Type of Farm Related to Efficiency of Labor.

Region	Average size	Area farmed per $100 worth of labor.
Ill.	160	78.8
Ala.	61	166.
Iowa	150	111.3
Mo.	140	123.1
Kan.	246	136.6
Cal.	190	29.6

Table XXXI shows some very interesting facts to the area farmed per $100. worth of labor on the various types of farms. It is quite striking that an Illinois farm of 160 acres, uses $100 worth of labor on each 78.8 acres. The cotton-belt farmer of Alabama with 61 acre farm uses $100. worth of labor on 166 acres. The small farmer of Alabama employs very little labor, while the Illinois farmer uses more hired help.

The Kansas farmer spends $100. worth of labor on 136.6 acres while the farmer in the fruit region, like California, spends $100. worth of labor on each 29.6 acres of farmed land. Iowa, the live-stock type of farming gets 111.3 acres farmed per $100. invested in labor, while Missouri, the diversified type of farming, gets 123.1 acres farmed for each $100. invested in labor. Table XXXI seems to indicate that the type of farming is the big factor determining the number of acres farmed per $100. invested in labor.

SIZE AND TYPE OF FARM IN RELATION TO THE EFFICIENCY IN THE USE OF MEN. The economy in the use of men is becoming increasingly important. The chief economy to be effected in the use of men is to keep them employed. It is difficult to keep men employed unless the farm is large enough in size. Some types of farming furnish more labor to men than others.

Table XXXII.- Size and Type of Farm In Relation To The Efficiency In The Use of Men.

Region	Acres of crops.	Average No. of men.	Acres of crops per man.
Ill.	125.66	1.51	83.2
Ala.	28.9	1.08	26.7
Iowa	107.22	1.30	82.4
Mo.	87.33	1.30	67.1
Kan.	148.5	1.47	101.
Cal.	73.	2.89	25.2

The larger the farm, the more acres of crops are grown, as shown by table XXXII. Illinois has 125.66 acres of crops per farm with 83.2 acres of crops per man, while Kansas has 246 acres per farm, with 101 acres of crops per man. The large farms of 246 acres like those in Kansas, supply the most labor per man. The california fruit farm requires the greatest number of men, one man for each 25.2 acres of crops.

Table XXXIII.- Relation of Size and Type of Farm to Efficiency in the Use of Men.

Region	Average size.	Average number of men.	Units of productive work per man.	Average labor income.
Ill.	160	1.51	195.8	$74.63
Ala.	61	1.08	263.6	243.81
Iowa	150	1.30	225.7	352.75
Mo.	140	1.30	189.1	403.55
Kan.	246	1.47	231.0	797.92
Cal.	190	2.89	199.2	1226.93

Table XXXIII shows the amount of productive labor furnished per man by the different kinds of farms with the average number of men and the labor income per farm. The number of men the different types of farms are able to keep, depends mostly on the crops grown and the type of farming practiced. The 160 acre corn-belt farm of Illinois furnishes labor for 1.51 men, while the 61 acre cotton farm supplies only enough work for one man.

The 140 acre Missouri farms maintain 1.3 men, while the 246 acre Kansas farms keep 1.47 men and the 190 acre California farms use 2.89 men per farm. The fruit farm furnishes more labor for men, but not so much for horses. The striking thing about the figures in table XXXIII is that the 61 acre cotton farm renders more labor per man than the big 246 acre wheat farm. The 61 acre cotton farm supplies 263.6 work days per man while the 246 acre Kansas wheat farm supplies 231 work days per man. There is much of the work on the cotton farm that is hand labor, while on the big wheat farms the labor is performed with machinery. The size of the farm effects the amount of labor furnished only when farms are considered of the same type, as to crops grown, climate and soil, topography, distance from market, etc. Thus the farm labor supplied per farm varies directly with the size of the business, but this does not hold true when various types of farms are considered.

RELATION OF SIZE AND KIND OF FARMING TO EFFICIENCY IN THE USE OF CAPITAL. The small farm has relatively much more of its capital invested in unproductive ways. The owner desires a respectable house, no matter how small the farm may be. If a farmer had all his money invested in buildings and machinery, his income would be zero. Money thus invested is not only unproductive, but is a source of constant cost for repairs.

Table XXXIV.- Relation of Size and Kind of Farming to Efficiency in the Use of Capital.

Region.	Average size.	Average value of buildings	Per cent of total investment.	Value of machinery & tools.	Per cent of total invest-ment.	Aver-age labor income.
Ill.	160	$2233.50	7.95	$428.40	1.51	$74.63
Ala.	61	222.60	17.76	52.10	4.23	243.81
Iowa	150	2413.20	12.10	468.90	2.33	352.75
Mo.	140	1510.00	11.16	263.69	1.94	403.55
Kan.	246	1297.	8.73	354.20	2.41	797.92
Cal.	190	1559.30	7.56	448.60	2.18	1226.93

Table XXXIV shows the inefficient use made of capital on the small farm. The small cotton type of farm in Alabama has 17.76 per cent of its total capital invested in buildings, while the big farms of Kansas have only 8.73 per cent of their capital invested in buildings. Illinois with 160 acre farms has 7.95 per cent of capital invested in buildings, while California with 190 acre farms has 7.56 per cent of capital invested in buildings. Iowa and Missouri have a much greater per cent of their capital invested in buildings than either Kansas, Illinois or California, because Iowa and Missouri are live-stock regions and more buildings are necessary. Therefore the per cent of capital invested in buildings depends upon size and the type of farming. The most efficient use of capital is made on the large farms.

It is very noticeable in table XXXIV the high per cent invested in machinery and tools in Alabama (4.23 per cent) and the small per cent of capital invested in machinery and tools (1.51 per cent) in Illinois. This shows that the small farm is handicapped because of the poor use made of capital invested.

Table XXXV.- Relation of Size and Type of Farm to Efficiency in the Use of Machinery.

Region.	Average size.	Acres of crops.	Value of machinery & tools.	Value of machinery per acre of crops.	Per cent of capital invested in machinery.
Ill.	160	125.66	$428.40	$3.40	1.51
Ala.	61	28.9	52.10	1.78	4.23
Iowa	150	107.22	268.90	4.37	2.33
Mo.	140	87.33	263.69	3.01	1.94
Kan.	246	148.5	354.20	2.38	2.41
Cal.	190	73.	448.60	6.14	2.18

Table XXXV shows the investment in machinery and tools per acre of crops grown. In California the farmers have $6.14 invested in machinery per acre of crops, and Iowa farmers have $4.37 per acre invested in machinery, while the farmers of Alabama have invested $1.78 per acre of crops. The small farms are very inadequately equipped with machinery. While the small farms are not very well equipped, they have about twice the per cent of capital invested in machinery compared to the other types of farms.

Use Of Work Stock And Machinery.

NUMBER OF WORK STOCK IN RELATION TO THE SIZE OF FARM, AVERAGE CROP ACRES PER HORSE, WITH LABOR INCOME. Table XXXVI shows the average number of work horses for the various types of farms.

Table XXXVI.- Number of Work stock in Relation to the Size Of Farm and Labor Income.

Region	Average size.	Number of work horses.	Average crop acres per horse.	Labor income.
Ill.	160	7.61	16.5	$74.63
Ala.	61	1.27	22.7	243.81
Iowa	150	6.54	16.3	352.75
Mo.	140	5.96	14.8	403.55
Kan.	246	7.29	20.3	797.92
Cal.	190	4.3	16.9	1226.93

The farmers of Illinois with 160 acre farms, keep 7.6 work horses and receive $74.63 as labor income. The farmers of Alabama have 61 acre farms; keep 1.27 work horses per farm and have a labor income of $243.81. From the size of the farms and the horses kept, it seems that the small cotton farmer makes the best use of horse labor. Iowa with 150 acre farms, has 6.54 work horses and Missouri with 140 acre farms, has 5.96 work horses per farm. Where the farms are similar in type, the size of the business determines the number of work horses.

Missouri has fewer horses than Iowa, but Missouri has the largest labor income. The size of the farm and the type of farming determine the number of work horses. Kansas with 246 acre farms, has fewer horses than Illinois. This is one reason why Kansas farmers make so much better labor income because of more efficient use of work horses. California has 190 acre farms and uses only 4.3 work horses but receives $1226.93 labor income. The fruit farm does not need so many work horses but they do make good use of the horses kept. There is a sad loss of labor on most farms. This loss is usually due to inefficient organization of the farm. Horse labor as well as man labor adds to the expenses of the farm, and should be carefully guarded against waste. To reduce horse-labor cost to the lowest limit, horses should be worked ten to twelve hours a day. The labor should be distributed so that there will be a uniform demand for horse labor thruout the year. In marketing produce or in hauling it from the fields to the farmstead, it is a point of economy to make few trips. Large loads should be hauled where ever possible. The product should be concentrated as much as possible. It is in this respect that live-stock products can be marketed so much more cheaply than grain or coarse feed. The number of crop acres a work horse will be able to tend, depends upon the size of the farm, the topography of the land and the kind of machinery employed.

Table XXXVI shows that the acres of crops per work horse varies with the size and type of farming. A work horse on the 160 acre Illinois farm tends 16.5 crop acres, while a horse on the small cotton farm tends 22.7 crop acres. The Illinois farmer does not use the work horse as efficiently as he should,because some are idle a big part of the time. The small cotton farm shows a better labor income in connection to the efficient use of work stock.

Kansas farmers have 246 acre farms and each work horse tends 20.3 crop acres, while a horse on 190 acre fruit farm tends 16.9 crop acres. The economical use of horse labor is as important as man labor. The economy in the use of horse labor is not only important, but much neglected and of little concern among the farmers. The chief difficulty with regard to horses on the farm,is to keep them employed thruout the year.

Table XXXVI ahows the average number of work stock kept on the different types of farms. In Minnesota in 1907 the cost of an hours work of a team in different counties varied from 15-20 cents per hour. In the same region, the cost of man labor averaged about 12 cents. The time of the team is therefore worth much more than the time of the driver. The horse labor runs as low as 6 cents an hour per horse, on some farms, while on other farms it costs 10 and 12 cents per hour of horse labor. Therefore some men have the skill and business ability to make money while other men lose money on their horse labor.

AVERAGE NUMBER OF WORKING DAYS PER HORSE IN RELATION TO THE TYPE OF FARMING AND LABOR INCOME. It is very important to get the maximum labor returns per work horse in successful farming.

Table XXXVII shows the average work days done per horse on the different types of farms. The small cotton farm of Alabama secures more days of labor per work horse than the large farms of Kansas.

Table XXXVII.- Average Number Of Working Days Per Horse In Relation To The Type Of Farming.

Region.	Average size.	Total productive horse work days.	Average work days per horse.
Ill.	160	375.54	49.4
Ala.	61	154.98	122.0
Iowa	150	286.41	43.7
Mo.	140	248.46	41.6
Kan.	246	434.15	59.5
Cal.	190	241.32	56.1

The work horse on the cotton farm renders 122 days of labor, while the work horse on the wheat farm renders 59.5 days of labor. Illinois corn farms furnish the greater number of total productive horse work days, but the large number of horses reduces the average number of work days per horse to 49.5.

The average work days per horse varies with the size of the farms except the cotton farm. A work horse should return on the average, not less than 100 days of labor for feed and care, if efficient and economic horse labor is rendered to the farming business.

FARM MACHINERY IN RELATION TO ACRES OF CROPS AND SIZE OF BUSINESS. Table XXXVIII shows the average value of machinery and tools per acre, the percent of capital invested in machinery and tools and total investment relative to the size of the business for the six types of farming in the United States. Table XVI shows that the average farm in the United States in 1910 had 3 per cent of its capital invested in machinery and tools. Table XXXVIII shows that the cotton farms have 4.23 per cent invested in machinery and tools, 1.23 per cent more than the average farm for the entire United States.

Table XXXVIII.- Farm Machinery In Relation To Acres Of Crops And Size Of Business.

Region.	Average size.	Average acres of crops.	Investment in machinery and tools.	Investment in machinery and tools.	Average value of machinery & tools per acre.
				per cent	
Ill.	160	125.66	$428.40	1.51	$2.67
Ala.	61	28.9	52.10	4.23	.85
Iowa	150	107.22	468.90	2.33	3.12
Mo.	140	87.33	263.69	1.94	1.88
Kan.	246	148.5	354.20	2.41	1.43
Cal.	190	73.	444.60	2.18	2.36

The corn-belt farms of Illinois have 1.5 per cent of their capital invested in machinery, which is far below the average for the United States. Missouri also has a low per cent(1.94) invested in machinery and tools. Iowa, Kansas and California have about the same per cent of their capital invested in machinery and tools. It is very important in the farming business to have sufficient machinery and economize in the cost of labor, but it is poor practice to own and maintain a wheat binder only to cut 10 acres of grain per year. Fields are irregular in shape and often are not so laid out as to be easily accessible. Time is lost in going to and coming from work. Often the fields are small and poorly adapted to working with the large modern machinery which is so rapidly taking the place of farm laborers.
The average amount invested in machinery and tools per farm in the United States in 1910 was $199. The types of farming in this study have considerable more invested in machinery and tools than the average farm in the United States, except the cotton farm of Alabama.

The coming of machinery has marked a great change. Modern machinery has made the farmer superior and more intellectual than the man with the hoe. The farmer can now do his work and still have time to plan his business, and to think of improvements.

Machinery has increased the wages, increased the production per capita and lessened the cost of production.

Machinery has also improved the quality of farm products.

By hand methods, the crop did not have time to mature.

Machinery has relieved the laborer of much drudgery; made his work and his hours of service shorter; stimulated his mental faculties; given an equilibrium of effort to mind and body; made the laborer a more efficient worker, a broader man and a better citizen.

Crop Yields and Quality of Live Stock.

Table XXXIX shows the live-stock kept per 100 acres of land, the receipts from crops and the average yield of corn per acre. This table has many things which indicate the type and practice of farming in the different states. The best yield of corn is secured in Illinois (39.2 bushels per acre) while the poorest yield is on the small cotton farm of Alabama, 12 bushels per acre. This difference is chiefly due to soil. Illinois and Iowa rank highest in the yield of corn because of fertile soil.

Table XXXIX.- Relation Between Type of Farming, Crop Yields and Labor Income.

Region.	Average animal units per 100 acres.	Per cent of receipts from crops.	Yield of corn per acre.	Average labor income.
Ill.	12.4	63.92	39.2 Bu.	$74.63
Ala.	7.6	91.09	12. "	243.81
Iowa	21.5	18.94	36.9 "	352.75
Mo.	16.1	14.51	26.9 "	403.55
Kan.	9.8	48.80	19. "	797.92
Cal.	8.3	86.36	24.9 "	1226.93

Alabama and Kansas have the lowest yield of corn.

There is a vast difference in the amount of live-stock kept on the several types of farms. The cotton farm only has 7.6 animal units per 100 acres while the fruit farmer has 8.3 animal units per 100 acres. This shows that these two types of farms handle very little live-stock and get more of their income from the sale of cash crops. The big grain farms make the best labor income when properly hanhled.

The diversified type of farming such as that of Missouri does not make such a large labor income, but the income is more permanent because of the many sources.

Iowa, the live-stock section, has 21.5 animal units per 100 acres of land and Missouri has 16.1 animal units per 100 acres. The types of farms that have the most of their receipts from cash crops, secure the largest labor income. Live-stock farming is the most profitable in the long run, as these farmers are building up their soil and getting a reasonable labor income at the same time. Lured by the high prices which have ruled for grain and other crops in recent years, many farmers all over the country have sold their crops for cash,rather than to follow the wiser plan of marketing a portion thru the feeding of live-stock, and thereby maintaining a balanced agriculture. Farmers seldom realize that with every ton of grain thus sold, they are removing from their farms $7. to $8. worth of fertility.

The loss thru such mining of soil is gradual, but in a comparatively few years there will result none the less surely, worn-out fields, lacking in plant food and humus, which must ever afterwards be fed with fertilizers to secure fair crops.

As the population of our country becomes more dense, most naturally and properly a smaller portion of the crops raised will be fed to animals and a larger part consumed directly by humans. This change must come with the increased demand for human food, since even high-producing animals are able to convert only a part of the food they eat into food for our consumption. Accordingly, with our increasing population, we should expect the census statistics to show that the number of animals on our farms are failing in some small degree to keep pace with the increase in people. The actual decrease in farm animals compared with population is however, surprising. While the population of the United States increased 21 per cent during the decade 1900 to 1910, the number of cattle and sheep decreased, and the number of swine increased but slightly. This indicates that if animal products are to hold their present important place in the diet of our people, American farmers must more thoroly appreciate the basic advantages of stock farming and better understand the principles and methods which are essential to its success.

RELATION OF CROP INDEX TO MAN LABOR AND RECEIPTS, PER ACRE ON CROPS. AND PER $100 WORTH OF FEED. The crop index indicates the quality of the business. The crop index is a standard by which the thrift, skill and success of a farmer may be estimated. The receipts per $100 worth of feed fed indicate the quality of live-stock and the ability of the farmer to apply the principles of economic feeding.

Crop yields are a very important factor affecting profits, but their importance has often been over emphasized. Yields are only one of the limiting factors in successful farming. Unfortunately the almost universal method of emphasizing the importance of yields is to disparage the importance of number of acres. The size of the business is fully as important as yields.

Table XL.- Relation Of Crop Index To Man Labor On Crops And Receipts Per Acre From Sale Of Crops, and Per $100 Worth of Feed.

Region.	Crop acres.	Crop index.	Man labor per acre on crops	Average receipts per acre from sale of crops	Receipts per $100 worth of feed fed
		per cent	days		
Ill.	125.66	113.17	1.74	$8.21	$52.51
Ala.	28.9	89.82	8.83	5.47	50.12
Iowa	107.22	113.59	1.56	2.35	99.87
Mo.	87.33	113.10	1.80	1.55	146.12
Kan.	148.5	113.39	1.64	4.10	121.48
Cal.	73.	118.45	6.98	15.18	60.65

The corn-belt farmer puts in 1.74 days of man labor per acre of crops, while the cotton farmer puts in 8.83 days of man labor per acre of crops. The cotton crop requires more labor per acre than the corn crop. Because the cotton farm supplies so much more labor there is a more efficient use of men and work horses which would mean a better labor income,if other things are not neglected. The days of man labor spent per acre of crops on the live-stock farm (1.56) the diversified farm (1.80) and the wheat farm (1.64) are much less than on the cotton farm (8.83) or on the fruit farm (6.98).
The fruit farm supplies very nearly as much man labor per acre of crops as the cotton farm. The average receipts per acre are much larger on the corn farm, the cotton farm, and the fruit farm. The receipts per acre on the fruit farm are $15.18 while the corn type of farm receives $8.21 and the cotton farm $5.47. Iowa and Missouri being live-stock sections, do not sell very much of their crops, but feed most of the crops on the farm, wheat being about the only crop sold. The receipts per $100 worth of feed fed, show that the farmers of Missouri get much better returns from the feed fed to live-stock, than Iowa or any of the other farming areas studied.

RELATION OF CROP YIELDS TO TYPE OF FARMING. Usually the most profitable way for the individual farmer to secure good crops is to get a farm that has a naturally rich soil. It is usually much cheaper to buy fertility in the soil than to buy poor land and spend years and money in making it productive. The small farm very often has lower yields than the large farm.

Table XLI.- Relation of Crop Yields to Type of Farming.

Region	Yields per Acre			
	Corn	Wheat	Oats	Hay
	bushels	bushels	bushels	tons
Ill.	39.2	17.98	36.2	1.26
Ala.	12.	cotton 151.4 lbs.	12.6	1.
Iowa	36.9	15.3 bu.	27.6	1.5
Mo.	26.9	14.8 "	23.1	1.1
Kan.	19.	13. "	24.6	1.73
Cal.	24.9	13.1 "	21.5	2.91

Table XLI shows that the small cotton farm has a very low yield of crops, but this is not entirely due to size of business. Kansas has on the average, only 19 bushels of corn per acre and the average size of farm has 246 acres. The factors that determine the yield of corn are soil, climate, rainfall and method of culture. With any given soil, the crops may be increased by saving the farm manure and by spreading it thin enough with a manure spreader so that the entire farm can be covered frequently.

The use of more fertilizers, lime, tile drains, better methods of tillage, and better crop rotations may also be called for. Apparently a farmer would do well to use some means by which he can obtain yields a little better than his neighbors obtain on the same soil. About a fifth better, seems to be a good standard to work for. If the neighbors raise one ton of hay, it is probable that it will pay to raise at least 1.2 tons. But on the soil that normally raises 1.5 tons, it is probable that 3 tons can be raised at less cost per ton on two acres than on one.

In short, it is usually not wise to go too far beyond the natural limitations of the soil. On some farms the larger yields are due to better soil, on others they are due to better methods of farming. The crop yields are controlled by soil, climate, kind of seed, and culture. Good crops are one of the primary factors affecting profits, but phenomenal crops are not necessary. Few farmers raise crops more than a third better than the average. One of the oft-quoted axims is that the farmer should "farm fewer acres and do it better".

ANIMAL UNITS IN RELATION TO THE TYPE OF FARMING.

Table XLII shows the number of animal units in the various kinds of live-stock kept per farm. Illinois has 8.20 animal units in horses, 6.66 in cattle and 2.28 animal units in hogs. Illinois has as many horses as cattle and hogs together.

Table XLII.- Animal Units in Different Kinds of Live-stock in Relation to Type of Farming.

Region	Number of work horses	Horses	Cattle	Hogs	Type of farm.
Ill.	7.61	8.20	6.66	2.28	Corn
Ala.	1.27	1.27	2.58	.64	Cotton
Iowa	6.54	7.08	15.46	7.40	Live-stock
Mo.	5.96	6.43	9.48	5.18	Diversified
Kan.	7.29	7.84	13.70	2.66	Wheat
Cal.	4.3	4.53	9.32	.67	Fruit

Since Illinois has 8.2 animal units in horses, 7.6 of this number are work horses, leaving only .6 of an animal unit in young horses. The total animal units in cattle per farm in Illinois are 6.66 with 4.78 of this number cows and 1.88 animal units in stock cattle. The cotton farm has a very small amount of live-stock, .64 animal units in hogs and 2.58 in cattle. Iowa, Missouri and Kansas handle the most live-stock. The fruit and cotton farms have the least live-stock.

When the great South comes into its own, cattle raising will balance cotton raising. Neither the cotton lint nor the oil obtained from the seed, which is a valuable human food, takes an appreciable amount of fertility from the soil. On the other hand, cottonseed meal is the highest in fertilizing value of all common plant products. Fortunately, it is at the same time the highest in feeding value for cattle of all our commonly available feeding stuffs. Therefore, by feeding the meal resulting from his cotton crop to live-stock, the southern farmer may bring back to his fields most of the fertility drawn out by the cotton plants in their growth. Thus he may reap a double profit.

In some sections of our country much of the land is so rough or stony that it can not be cropped economically. Here cattle will gather the grass on the smoother stretches and sheep will search out the herbage on the more inaccessible, rocky slopes. Over great areas of the West there is too little rainfall to warrant even dry farming, and irrigation will never be possible, either because of lack of water or the roughness of the land. Yet stock will thrive on the scanty but highly nutritious grasses and other forage. Thru well-planned systems of grazing, with additional feed in time of winter storm or parching drought, the western ranges should, at no far distant date carry even more stock than they did before large areas were broken up into farms.

In the cut-over districts of our country, large areas of land may be profitably grazed by live-stock before they are finally brought under tillage.

The animals of the farm should be regarded as living factories that are continuously converting their feed into products useful to man. A fact of great economic importance is that a large part of the food they consume is of such character that humans can not directly utilize it themselves. Among the products yielded by the farm animals are not only articles of human diet, such as meat, milk, and eggs, but also such materials as wool,mohair and hides, which are needed for clothing and other purposes. Another product of greater aggregate money value than any one of these is the work performed by horses and other draft animals. Altogether, the farm animals of the United States yield each year products worth over $5,000,000,000. a sum nearly as great as the value of all the crops annually harvested on our farms.

RELATION OF PRODUCTION OF ANIMALS TO PROFITS. Table XLIII shows that the receipts for milk and butter per cow in Illinois are $18.11 while the receipts per cow in Alabama are $2.12. Better cows and better feeding are the two chief differences that result in better returns per cow.

Table XLIII.- Relation of Production of Animals to Profits.

Region	Average size	Number of cows	Receipts per cow	Average labor income
Ill.	160	4.78	$18.11	$74.63
Ala.	61	1.88	2.12	243.81
Iowa	150	9.22	8.40	352.75
Mo.	140	5.	7.38	403.55
Kan.	246	7.66	7.84	797.92
Cal.	190	6.37	22.27	1226.93

The receipts per cow on the cotton farm are very low, while the receipts per cow on the fruit farm are $22.27 compared to $2.12 on the cotton farm. The receipts per cow in Iowa, Missouri and Kansas seem to be low, ranging from $7.38 in Missouri to $8.40 in Iowa. In this study with such a variety of types of farms considered, there does not seem to be very much relation between the receipts per cow and labor income. It is evident from table XLIII that the farmers in the regions studied, especially the cotton farmer,sells very little dairy products. In the South the warm climate, the type of farming and character of the people are unfavorable to the best use of milk cows. If a farm keeps many animals, the returns from them are of - course just as important as are the crop yields. The products sold from the average cow,little more than pay for the feed.

But the value of the feed in Illinois is usually only about 55 to 70 per cent of the total cost of keeping a cow. There can be no profit from keeping an average cow with the present prices that farmers receive for their dairy products. The prices of products ought to be high enough so that an average cow would pay interest and wages to the farmer. But the general question as to price of milk is not a matter that any individual farmer can settle. The individual must take the price offered, and, if he is to make a profit, must adjust his business accordingly. There is no surer way of losing money than to feed cows that do not pay their feed bill.

ANIMAL UNITS, FEED PER ANIMAL UNIT AND RECEIPTS FROM SALE OF STOCK. In table XLIV the feed purchased per live-stock unit varies from $1.88 on the corn farm, to $12.33 on the fruit farm. The total feed per live-stock unit varies from $22.58 on the cotton farm to $133.66 on the corn farm.

Table XLIV.- Animal Units,Feed Per Animal Unit and Receipts.

Region	Total animal units	Feed purchased per L.S.U.	Total feed per L.S.U.	Receipts from sale of stock	Receipts from wool	Receipts from eggs and poultry
Ill.	19.98	$1.88	$133.66	$502.60	$3.13	$64.97
Ala.	4.56	4.01	22.58	11.29	0	4.19
Iowa	32.33	3.06	59.26	1278.90	5.15	86.41
Mo.	22.58	7.51	48.65	1107.30	6.45	74.95
Kan.	24.35	4.17	49.75	834.70	.25	80.21
Cal.	15.94	12.33	79.94	211.90	8.28	63.64

The receipts from the sale of live-stock are $11.29 on the cotton farm; $211.90 on the fruit farm, and $1278.90 on the live-stock farm. Iowa and Missouri sell the most live stock. The average receipts on the farms in Kansas from the sale of wool are $.25 per farm. It is very interesting to note that the small cotton farmer receives only $4.19 from the sale of eggs and poultry per year, while the average Iowa farmer sells $86.41 worth of eggs and poultry per year.

Live-stock on a farm usually helps greatly in furnishing continuous employment. Live-stock is primarily a method the farmer employs of marketing his produce, and the live-stock yield must be equivalent to the market price of the feed or a loss is occasioned; but if live-stock yields even a small margin over current prices of feed, when the labor employed in caring for the stock would be otherwise idle, then the industry becomes highly desirable and contributes to the profit of the farm.

Productive Labor.

Labor has worried men of all classes and ocupations. Even the farmer does not escape. Labor may be divided into two classes, productive and non-productive. Productive labor means labor which adds to the assets or value of the farm. If a farm is worth more money because of some previous labor, that labor was productive, but labor used for maintenance is non-productive. Building a new barn is productive labor, but repairing an old one is non-productive. The work on work horses is non-productive while the work on other stock on the farm is productive. Productive labor includes work on live-stock, on farm crops or on improvements. So many farmers lose time because of irregular fields, too small an area of the crop, or too few animals, because fields are too far away, because milk is hauled too far or in too small loads or for many other reasons. It makes no difference how time is lost. If it is lost, the farm is inefficient. This may be the fault of natural conditions or of the management. The American farmer is a man who does not like to be worried with such detail work as the keeping of farm accounts and labor records. This is too mild a recreation for his strong muscles. He is not in tune with delicate styles of eating and the systematic handling of business and the gathering of useful knowledge.

AMOUNT OF PRODUCTIVE LABOR FURNISHED BY THE VARIOUS TYPES OF FARMS. By comparing the productive work or work units on different types of farms, we may get an approximate measure of what is being accomplished. Work units are not a measure of how hard men work, but of what is accomplished.

Table XLV.- Amount Of Productive Labor Furnished By The Various Types Of Farms.

Region	Man work units on crops	Man work units on stock	Total man work units	Total horse work units
Ill.	218.65	77.13	295.78	375.54
Ala.	255.33	29.26	284.69	154.98
Iowa	167.44	126.10	293.53	286.41
Mo.	157.98	87.87	245.85	248.46
Kan.	244.13	95.49	339.62	434.15
Cal.	509.63	66.09	575.72	241.32

Work units are a measure of the amount of productive work done on the farm. Much unproductive work must always be done. The farmers thruout the United States have been too careless in the use of labor. Well organized farms are able to do 300 productive work units per man and yet get good crops. On some farms the men average as high as 380 to 400 work units. Horses may do as high as 150 work units, but 75 to 100 is more common. Table XLV shows the amount of man labor put in on crops and live-stock.

The man labor put in on crops in the fruit section was 509.63 work units, while in the diversified section 157.98 man work days were put in on crops. The fruit farm has more man labor put in on crops but the diversified farm has more man labor put in on live-stock. In the cotton section there were 255.33 days of man labor put in on crops, while in the corn section 218.65 days of man labor were put in on crops. There were 77.13 days of man labor put in on live-stock in Illinois and only 29.26 days of man labor done on live-stock in Alabama. The greatest number of days of man labor were put in on live-stock in Iowa, because this is a live-stock region and more live-stock is handled per farm. Under exclusive grain farming the chief demand for labor is confined to the periods of preparing the land, planting the crops, harvesting and later marketing the products. During the rush seasons, labor is high-priced, and often hard to secure at any cost. This is true of the cotton and fruit types of farms as most of the labor must be done during the rush season. Illinois farmers have to keep a large number of work horses the year round so as to have them during the few months of the crop season. This is one of the disadvantages of the grain, cotton, and fruit type of farming. On the other hand, live-stock farming offers employment thruout the entire year. In the winter time when little other farm work can be done, is the very season when farm animals require the most care and attention, for they are then usually housed instead of at pasture.

Because the live-stock farmer can thus offer steady employment he is usually able to secure men who are both more efficient and more reliable than he would otherwise be able to obtain.

AVERAGE AMOUNT SPENT FOR HIRED LABOR, COST PER ACRE AND AVERAGE NUMBER OF HIRED MEN PER FARM. Table XLVI shows the average cost of hired labor per acre for the various types of farms. The number of hired men per farm varies from less than one-tenth of a man on the cotton farm to 1.89 men on the fruit farm.

Table XLVI.- Average Amount Spent For Hired Labor and Cost Per Crop Acre.

Region	Crop area	Average amount spent per farm for hired labor	Average hired labor cost per crop acre	Average number of hired men per farm
Ill.	125.66	$203.16	$1.61	.51
Ala.	28.9	36.84	1.27	.08
Iowa	107.22	124.68	1.16	.30
Mo.	87.33	113.71	1.30	.30
Kan.	148.5	180.26	1.21	.47
Cal.	73.	640.15	8.76	1.89

The fruit farmer employs more hired labor than either of the other types of farming. The fruit farmer spends $640.15 for hired labor, while the cotton farmer spends $36.84.

The average hired labor cost per crop acre ranges from $1.16 on the live-stock farm, to $8.76 on the fruit farm. Thus we see the amount of money spent for hired labor by the various types of farming. Experience and careful study alone can tell how much labor can be profitably expended with a given amount of capital invested. So long as an increase in labor can bring an increase in returns, so long should it be profitable to increase the expenditure in this line. A very important and difficult problem is the adjustment of the system of operations in such a way as to employ as nearly as possible a uniform amount of labor throughout the season or throughout the year. The man who can assure the workman a steady place throughout the year, is sure to attract the better class of men other things being equal.

The hardest problem in ordinary lines of farming is to provide for work during winter. There is little trouble to arrange matters during eight months or two-thirds of the year; the difficulty comes with the other third, during the dead of winter. Winter labor can be supplied on many farms where much rough land exists, by the care of the woodlot, securing fire-wood, fence posts, lumber, and wagon timber.
In other sections winter dairying, winter lambs, repairing and painting of machinery and tools furnish sufficient labor during this part of the year.

The farmers who have comfortable buildings in which to do their work,who keep good live-stock and follow good systems of farming, have much less trouble in interesting their laborers in the work of the farm, and in keeping them than do those who get along from day to day in a shiftless kind of way.

SUMMARY

The Corn Farm.- The farmer has 84.7 per cent of his capital invested in land and only 5.7 per cent invested in live-stock. The average farm in the United States has 15 per cent of capital invested in live-stock and 70 per cent in land. In this state the farmers have invested $177.01 per acre and receive a very small labor income ($74.63). The total capital invested per farm is $28,312 but the farmers receive only 5.26 per cent on their investment. This includes interest at 5 per cent, compensation for labor and profits. The quality of the farming business in the corn-belt section is indicated by the yield of crops and receipts per animal unit. The crop index is 133.17 while the yield of corn is 39.2 bushels per acre and the receipts per cow are $18.11. The amount accomplished per worker is shown by the crop acres tended per man (83.2) and the productive work units done per man (195.8). The efficiency of labor is shown by the area farmed per $100 worth of labor (78.8 acres) and the number of acres of crops tended per work horse (16.5). Illinois has 7.6 work horses per farm and each horse tends 16.5 acres of crops with a total of 49.4 days of labor. The receipts per acre from sale of crops were $8.21 and there were 1.74 days of man labor put in per acre on crops. The average farmer in Illinois has 19.9 animal units per farm but 7.6 are work horses. This indicates that the Illinois farmers are not handling very much live-stock.

The average amount spent per farm for hired labor was $203.16 with a cost per crop acre of $1.61.

The Cotton Farm.- This farmer has $751 invested in land, $222 in buildings, $229 invested in live-stock and $52. invested in machinery and tools and makes a labor income of $243.81. The capital invested in the various enterprises on the basis of per cent run as follows; land 59.6 per cent; buildings 17.7; live-stock 18.3; machinery and tools 4.2 per cent. The farmer in Alabama has his money distributed as follows; average per acre $12.30 in land; $3.64 in buildings, $3.76 in live-stock, and $.85 per cent in machinery and tools. The cotton farmer has a 61 acre farm,with a total investment of $1260 and receives a labor income much better than the farmer in Illinois. The cotton farmer receives 91 per cent of his receipts from the sale of cash crops and realizes 24.3 per cent on his investment. The cotton farm furnishes 26.7 crop acres per man, 22.7 crop acres per horse and has $100 worth of equipment invested for every 55.5 crop acres.
The cotton farm furnishes 263.6 productive work days per man and 122 work days per horse. The 61 acre cotton farm uses 1.08 number of men and 1.27 work horses. $100 worth of labor will farm 166. acres of crops in Alabama, while in Illinois $100 worth of labor farms 78.8 acres. This is due to cheap labor, climate, soil, and method of farming.

The yields in the cotton section are very low,as the crop index is only 89.8 and the yield of corn is 12 bushels per acre and the yield of oats is 12.6 bushels per acre. The cotton farm keeps the following animal units in live-stock; work horses 1.27; cattle 2.58; hogs .64. The number of milk cows kept per farm is 1.88 and the receipts per cow are $2.12. The amount spent per farm for hired labor is $36.84 with $1.27 as the labor cost per crop acre.

The Stock Farm.- This man has a total investment per farm of $20,094 with the capital distributed as follows,in the farm enterprises; in land 75 per cent; in buildings 12 per cent; in live-stock 10.3 per cent, and in machinery and tools 2.3 per cent. The average farmer receives $352.75 as a labor income. This is about what the average laborer receives. The investment per acre ranges as follows; land $100.70; buildings $16.; live-stock $13.80; and machinery and tools $3.12. The farmers in this section receive 18.94 per cent of their receipts from crops and 81.06 per cent from the sale of live-stock. They realize 6.75 per cent on their investment and deducting 5 per cent as interest charge, leaves 1.75 per cent as compensation for labor and profits in the business. The average size farm contains 150 acres, which furnishes 82.4 crop acres per man and 16.3 crop acres per horse.

It takes more equipment on the live-stock farm than on the grain farm, as $100 worth of equipment covered 22.9 crop acres while in Illinois $100 worth of equipment covered 29.3 crop acres. The live-stock farm furnishes more days of productive labor per man (225.7) than the corn type of farm, but not so many days of labor (43.7) per horse. The crop index is 113.59 slightly more than the crop index for Illinois. The area farmed in Iowa per $100 worth of labor is 111.3 acres. The average number of men per farm is 1.3 with an average number of 6.5 work horses per farm. A farmer in Iowa has 21.5 animal units per 100 acres of land while in Illinois there are only 12.4 animal units per 100 acres of land. The average receipts per acre from sale of crops are $2.35 in Iowa. This shows that most of the feed is fed to live-stock instead of being sold. Iowa has the following animal units in the different kinds of live-stock; work horses 6.54; young horses .54; cattle 15.46; and hogs 7.40. Iowa handles more live-stock than any other types of farms studied. There are 9.22 cows per farm and the receipts per cow are $8.40. The average amount spent per farm for hired labor is $124.68 with a labor cost per crop acre of $1.16.

The Diversified Farm.- This type of farmer has $10,059 invested per farm with the capital distributed as follows; in land 74.3 per cent; in buildings 11 per cent; in live-stock 12.5 per cent, and in machinery and tools 1.9 per cent. The average labor income per farm is $403.55. The average farm in the United States has the following per cent of capital invested in the various farm enterprises; land 70 per cent; buildings 15 per cent, machinery 3 per cent, and live-stock 15 per cent. The average size of farm in Missouri has 140 acres and the average capital invested per acre for the different enterprises is; land $70.51; buildings $10.70; live-stock $12.12; and machinery and tools $1.88. The Missouri farmers receive 14.51 per cent of their receipts from crops and 85.49 per cent from the sale of live-stock. On the diversified farm the crop acres per man are 67.1 and the crop acres per horse are 14.8. $100 worth of equipment farms 33.2 acres. The farms of Missouri do not furnish as much productive labor per man (189.1 days) and per horse (41.6 days) as the other types of farms. The quality of the farm business is expressed by the crop index (113.1 per cent) is not as high as the yields in Illinois or Iowa but much better than Alabama. The area farmed per $100 worth of labor is 123.1 acres. This type of farming keeps 1.3 men and 5.96 work horses per farm.

The average animal units per 100 acres of land are 16.1 and the receipts per acre from the sale of crops are $1.55.
Missouri farmers sell less of crops per acre than Iowa.
The average yield of corn is 26.9 bushels, wheat 14.8 bushels, oats 23.1 bushels and the average yield of hay per acre is 1.1 tons. Missouri ranks next to Iowa in the amount of live-stock kept per farm. The animal units in different kinds of live-stock kept per farm are as follows; work horses 5.96, young horses .47, cattle 9.48 and hogs 5.18. The number of cows kept per farm is 5 and the receipts per cow are $7.38. This shows the small amount of dairy products sold off the farm per cow.
The average amount spent per farm for hired labor is $113.71 and the hired labor cost per acre of crops is $1.30.
The receipts per $100 worth of feed fed are $146.12.
This shows that the farmers of Missouri get good returns for the feed fed to live-stock.

The Wheat Farm.- This man has invested $14,642. and his capital is distributed as follows;land 77.67 per cent, buildings 8.7 per cent; live-stock 11.19; machinery and tools 2.41 per cent. The average size farm contains 246 acres. The average value per acre of capital invested in the enterprises of the farm is as follows; Land $47.21; buildings $5.10; live-stock $6.66, and machinery and tools $1.43. Kansas has the cheapest land except Alabama. The per cent of receipts from crops is 48.8 and the receipts from live-stock are 51.20 per cent. The farmer realizes 10.4 per cent on his investment, deducting 5 per cent for interest leaves 5.4 per cent as a compensation for his labor and profits. The 5.4 per cent is the labor income which is $797.92. The farmer in Kansas, by use of big machinery, is able to handle 101 crop acres. The number of crop acres per horse is 20.3 and the number of crop acres farmed per $100 worth of equipment is 41.9. The productive work units done per man are 231 while the productive work units done per horse are 59.5. The crop index for the wheat section is 113.39. The area farmed per $100 worth of labor is 136.6 acres. The average number of men per farm is 1.47 and the average number of work horses is 7.29. The average animal units per 100 acres of land are 9.8 and the receipts per acre from the sale of crops are $4.10. The average number of cows per farm is 7.66 and the receipts per cow are $7.84.

The average amount spent per farm for hired labor is $180.26 and the labor cost per crop acre is $1.21. The receipts per $100 worth of feed fed are $121.48. The farmers of Kansas are better farm administrators than the farmers of either Iowa, California, Illinois or Alabama, but not so good as the farmers of Missouri, when considered fron the returns per $100 worth of feed.

The Fruit Farm.- It contains on the average 190 acres, with a capital investment of $20,635.20. The capital is distributed as follows; land 85.2 per cent, buildings 7.56, live-stock 5.04, machinery and tools 2.18 per cent. The average value invested per acre in the various enterprises is as follows; land $118.67, buildings $8.20, live-stock $5.40 and machinery and tools $2.36. The farmers receive 86.36 per cent of their farm receipts from cash crops and receive a labor income of $1226.93. The fruit farmer receives the best labor income and realizes 11.03 per cent on the farm investment. The fruit farmer is making interest and a fairly good labor income. The average man tends 25.2 crop acres while the average horse tends 16.9 acres. The number of crop acres farmed per $100 worth of equipment is 16.3. This type of farm furnishes 199.2 productive work days per man and 56.1 productive work days per horse. The quality of fruit farming is indicated by the crop index which is 118.45 and the receipts per $100 worth of feed fed ($60.65.)

The average number of men kept per farm is 2.89 and number of work horses is 4.3. The animal units kept per farm except work horses are 4.02. The area farmed per $100 worth of labor is 29.6 acres. This is quite a contrast to Kansas, the wheat section, which gets 136.6 acres farmed per $100 worth of labor. The average receipts per acre from the sale of crops are $15.18 compared to $4.10 from sale of crops on the wheat farm.
The fruit farm handles very little stock as shown by the following animal units; in work horses 4.3, in young horses .23, in cattle 9.32, and in hogs .67. The average fruit farm keeps 6,37 milk cows and the receipts per cow are $22.27.
The average amount spent per farm for hired labor is $640.15 and the average hired labor cost per crop acre is $8.76.

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