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Organization and Operation of Farms in the Claypan Area of Southern Illinois

By A. J. CROSS and J. E. WILLS¹

IN THE CLAYPAN SOILS area of southern Illinois farms are typically small, investments of capital are small, and income from farming is low. These conditions are closely related to the characteristics of the soils and the tenure pattern in the area. The cover illustration shows the location of this area.

The purpose of this study was to obtain more precise information than has been available concerning the resources of the farms in this area, their organization and methods of operation and their management problems, as background for further study of the opportunities for making profitable adjustments on individual farms. The necessary information was obtained by studying 198 farms selected by an enumerative sampling procedure. The farms were all located in Wayne county and each consisted of 30 acres or more. They were representative of most of the operating units in Wayne county, those on claypan soils in the neighboring counties of Clay, Jefferson, Marion, Richland, Hamilton, and Edwards, and a large number of farms in other parts of the claypan area. Although the soils are similar, a large number of farms in the northwest part of the area differ considerably from those in Wayne county because they are in the St. Louis milkshed. A large number in the southern part of the area are somewhat different because they are near coal mines. Many miners in that section operate small part-time farms.

Although incomes generally are low, progressive farmers in the claypan area are demonstrating the possibilities for better farming by (1) improving their land, thereby increasing the acre-yields of crops; (2) keeping more dairy cattle, beef cattle, or sheep to consume the greater amounts of better-quality forage produced; and (3) using more effectively their available family labor in their farming operations.

CHARACTERISTICS OF CLAYPAN SOILS

Claypan soils are acid, they are lacking in abundant natural fertility, and they are underlain by an almost impermeable subsoil known as claypan. This subsoil prevents natural underdrainage during rainy periods and keeps moisture beneath the subsoil from reaching the roots

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of plants when the weather is dry. As a result, when these soils are not properly treated and managed, yields are extremely low.

Even though the management is good, crops on these soils suffer noticeably from a deficiency of moisture after 10 or 15 rainless days. In the absence of open drainage ditches, water stands on the level or nearly-level land for several days after a heavy rainfall. Because there is only a short period in the spring when these soils are not too wet or too dry to work, timeliness of operations is essential for successful grain production. If soil conservation practices are not used where there is considerable slope, water runs off rapidly and often causes serious erosion.

CHANGES RESULTING FROM MECHANIZATION

Although mechanization was delayed in the claypan area, it has increased greatly in recent years and has had a marked influence on farming. According to the U. S. Census, one out of nine farms in the 20-county area had tractors in 1930, one out of four in 1940, and three out of five in 1950. In the present study seven out of ten Wayne county farms of 30 acres and larger had tractors in 1948.¹

Because of the physical condition of claypan soils, the influence of mechanization has been particularly great. In most seasons these soils are in good working condition only for short periods. The acreage that could be plowed and tilled with horsepower was definitely limited, and previous to mechanization large acreages were idle or in grass. Increased mechanization was an important influence in causing the following changes in the 20 claypan counties:

1. Average size of farm increased from 112 acres in 1930 to 114 acres in 1940 and to 127 acres in 1950.
2. Total acreage of idle cropland and crop failure declined from 757,000 in 1929 to 367,000 in 1949, or from 16 percent to 7 percent of all land in farms.
3. Total area in soybeans increased from 78,000 acres in 1929 to 267,000 acres in 1939 and to 766,000 acres in 1949.
4. Total area in corn increased from 818,000 acres in 1929 to 832,000 acres in 1939 and to 901,000 acres in 1949.

In 1949 soybeans were grown on a larger proportion of the cropland in this area than in any other area of Illinois. Roughly half the increase in corn and soybean acreages from 1929 to 1949 is accounted for by the decrease in idle cropland. The other half is accounted for mainly by a reduction in redtop for hay, pasture, and seed production.

¹ In the economic area including Wayne county 87 percent of all farms of 100 acres and more reported tractors in the 1950 Census, 42 percent reported combines, and 23 percent reported corn pickers.

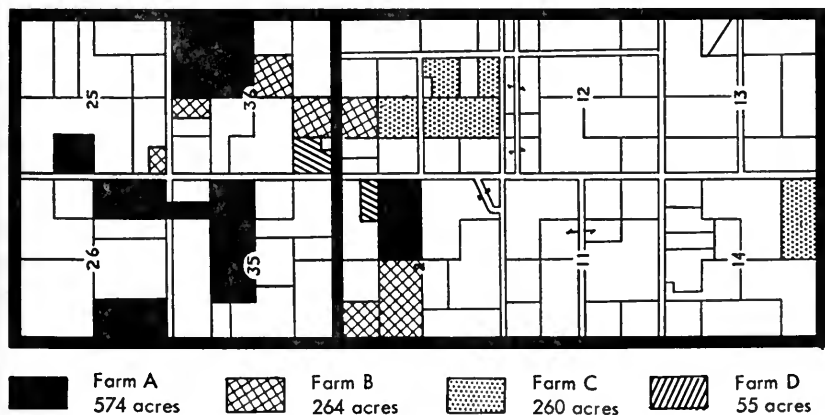
GENERAL TENURE PATTERN IN THE AREA

A few active Wayne county operators carry on intensive farming programs on one small tract of land, and a few others have tracts large enough to support extensive farming. But most of these operators carry on extensive farming programs on two or more tracts that are not contiguous (Fig. 1) or, if contiguous, are not owned by the same individuals.

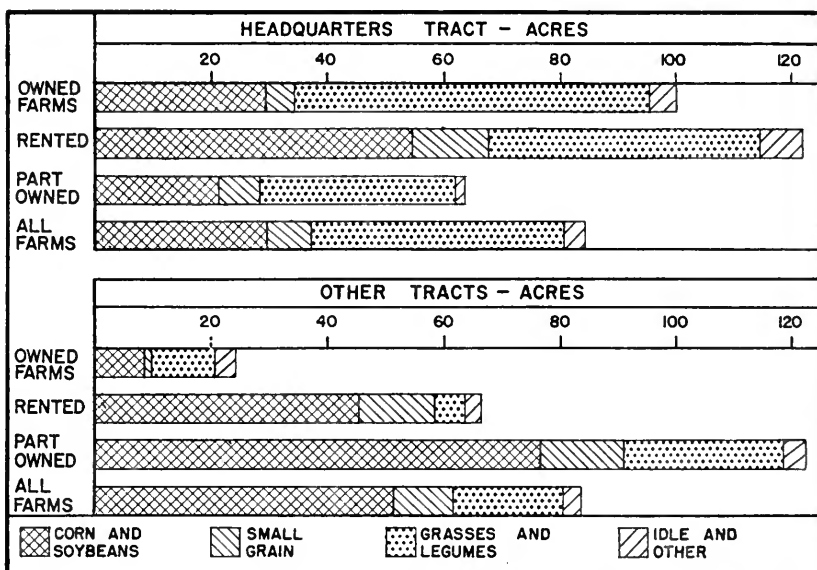
The tract on which the farm headquarters is located is usually owned by the operator. This tract generally has a higher percentage of its area in grasses and legumes than any of the others, and usually accounts for the greater proportion of the hay and pasture produced on the farm (Fig. 2). The additional tracts, particularly when rented, are used mainly for the production of corn and soybeans.

Most operators who rent land rent individual fields or farms on a crop-share basis. Only three livestock-share leases were found among the farms surveyed. When individual fields are rented for grain, the predominant renting agreement provides that the operator receive two-thirds of the crop and the landlord one-third. If a farmer cuts a field of hay he receives half and the landlord receives half. When a farm is rented under a crop-share lease, the operator usually receives two-thirds of the grain produced and half the hay. He has the use of the farmstead and pasture free of charge or pays the landlord a small amount of cash rent for it.

Change in activity of operators. Many farmers in this area, after they pass their most active years, gradually reduce the size of their farm business, but they continue to live on the headquarters tract.



The location of the tracts farmed by four Wayne county operators indicates the complexity of the tenure pattern in the claypan area of southern Illinois. (Fig. 1)



Use of tillable land on headquarters tracts and on other tracts. Average of 198 Wayne county farms, 1948. (Fig. 2)

During this transition period of 10 to 20 years a farmer may first rent fewer acres; later he may stop renting and farm only the land he owns. Still later he may rent to younger farmers, on a share basis, some of his tillable land that is best adapted to corn and soybeans.

Although livestock numbers are gradually reduced during the transition period, a number of farmers still keep enough livestock to consume most of the grain they receive as rent. Some farmers, as they grow older, carry almost as many livestock as they did when they were most active. On these livestock farms most of the reduction in farm income is due to the fact that there is considerably less grain to sell or to the fact that part of the livestock feed previously produced on the farm must be purchased.

In the semiretired or retired years the only farming the operator does is to milk one or two cows, take care of a small flock of chickens, grow a garden, or concern himself with some other enterprise that requires only a limited amount of effort.

Tenure status. As previously indicated, the most active operators own part of the land they are farming and rent part. Of the 198 farms surveyed 106, or 54 percent, were operated by members of this group (Table 1). The land in these farms totaled about 58 percent of all the land farmed, about 56 percent of all the land owned, and approxi-

mately 60 percent of all the land rented. Although only 34 of the remaining 92 farms consisted entirely of rented land and 58 consisted entirely of owned land, each of these two groups accounted for approximately the same percentage of the acreage sampled. This was because practically all 34 operators of rented farms were active and therefore farmed relatively large units, while a large number of the 58 operators of owned farms were approaching retirement or were semi-retired and had considerably reduced the acreage they farmed.

Table 1.—Acres and Percentage of Owned and Rented Land on 198 Farms in Three Tenure Groups in Wayne County, Illinois, 1948*

	Owned farms	Rented farms	Part-owned farms	All farms
Number of farms.....	58	34	106	198
Percent of farms.....	29	17	54	100
Owned land				
Acres.....	8,706	.....	11,232	19,938
Percent.....	43.7	.....	56.3	100.0
Rented land				
Acres.....	.....	8,269	12,340	20,609
Percent.....	.....	40.1	59.9	100.0
All land				
Acres.....	8,706	8,269	23,572	40,547
Percent.....	21.5	20.4	58.1	100.0

* Farm survey. All farms include 30 or more acres.

Size of farms as related to tenure. The average farm comprised about 205 acres (Table 2). Owned farms, with 150.1 acres, were considerably smaller than the average farm, while part-owned farms and rented farms, with 222.4 and 243.2 acres respectively, were somewhat larger than the average.

About 41 percent of the owned farms were smaller than 100 acres, but none of the rented farms and only about 11 percent of the part-owned farms were smaller than 100 acres. Only 14 percent of the owned farms were larger than 260 acres, whereas 44 percent of the rented farms and 28 percent of the part-owned farms were larger. These facts are shown graphically in Fig. 3.

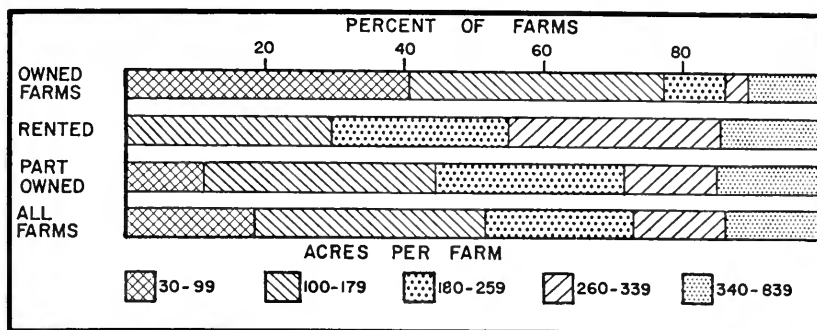
The chief reason why the average owned farm is considerably smaller than the farms in the other two groups is that a large number of these operators are past middle age and are semiretired. They do not rent additional tracts. They carry on a reduced farming program on their headquarters tract, and they rent out some of their tillable land to younger farmers. Another reason for the smaller average size of owned farms is that some of these farms are owned by young men who are part-time farmers actively engaged in nonfarm work.

Table 2.—Land Use per Farm on Sample Farms in Different Tenure Groups^a

Land use	Owned farms (58)		Rented farms (34)		Part-owned farms (106)				All farms (198)			
	Owned farms		Rented farms		Owned land		Rented land		All land			
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent		
Tillable land in—												
Corn.....	27.3	21.9	60.7	32.3	20.0	24.1	39.4	38.3	59.4	31.9	50.2	29.8
Soybeans.....	10.6	8.5	39.0	20.7	14.5	17.4	24.1	23.4	38.6	20.7	30.5	18.1
Total.....	37.9	30.4	99.7	53.0	34.5	41.5	63.5	61.7	98.0	52.6	80.7	47.9
Small grain.....	6.0	4.8	20.6	14.1	8.8	10.6	12.6	12.3	21.4	11.5	17.8	10.6
Grasses and legumes.....	72.4	58.2	52.0	27.6	37.3	44.8	23.7	23.0	61.0	32.8	62.8	37.3
Idle.....	7.8	6.3	9.8	5.2	2.4	2.9	2.9	2.8	5.3	2.9	6.8	4.0
Miscellaneous ^b.....	.3	.3	.1	.1	.2	.2	.2	.2	.4	.2	.3	.2
Total tillable land.....	124.4	100.0	188.2	100.0	83.2	100.0	102.9	100.0	186.1	100.0	168.4	100.0
Nontillable land in—												
Pasture.....	5.8	.....	26.8	.....	8.1	.....	2.6	.....	10.6	.....	12.0	.....
Other.....	19.9	.....	28.2	.....	14.7	.....	10.9	.....	25.7	.....	24.4	.....
Total nontillable land.....	25.7	.....	55.0	.....	22.8	.....	13.5	.....	36.3	.....	36.4	.....
Total land.....	150.1	.....	243.2	.....	106.0	.....	116.4	.....	222.4	.....	204.8	.....
Percent of land tillable.....	.....	82.9	.....	77.4	.....	78.5	.....	88.4	.....	83.7	.....	82.2

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b Includes buckwheat, cane, milo maize, orchards, popcorn, and sunflowers.



Percentage of farms in various size-groups in Wayne county, 1948. Total of 198 farms. (Fig. 3)

The difference of 20.8 acres between the part-owned farms and rented farms is attributable primarily to a difference in renting agreements and perhaps slightly to a difference in the age and activity of the operators. The average operator of rented farms was approximately four years younger than the average part-owner operator (Table 3). Operators who farm only rented land usually rent one fairly large ownership unit; the headquarters tract, and the woodland and wasteland on this unit are included in the total acreage. Operators who own a small headquarters tract and rent fields, rent only tillable land; and woodland and wasteland on the ownership unit on which the rented fields are located are not included in the total acreage.

Table 3.—Tenure Data for Sample Farms*

Item	Owned farms	Rented farms	Part-owned farms	All farms
Number of farms.....	58	34	106	198
Total tracts.....	94	103	433	630
Tracts per farm.....	1.6	3.0	4.1	3.2
Percent of farms with—				
One tract.....	56.9	26.5	.....	21.2
Two to four tracts.....	43.1	58.9	65.1	57.6
Five or more tracts.....	.....	14.6	34.9	21.2
Average acres in tracts				
Headquarters tracts.....	116.4	157.9	78.1	103.0
Other tracts.....	54.3	42.1	46.8	46.6
All tracts.....	92.6	80.0	54.4	64.4
Average age of operators, years..	52	39	43	45

* Farm survey, Wayne county, 1948. All farms include 30 or more acres.

Land use as related to tenure. The average rented and part-owned farms, as just pointed out, had about the same acreages of tillable land, and their land-use programs were quite similar. The average owned unit had about 60 acres less tillable land and a land-use program that was quite different from the other two. Although rented farms had 53.0 percent of their tillable land in corn and soybeans and part-owned farms had 52.6 percent, owned farms had only 30.4 percent; and although the rented farms had 14.1 and part-owned farms 11.5 percent of their tillable land in small grain, the owned farms had only 4.8 percent. However, owned farms had about 58 percent of their tillable land in grasses and legumes, while part-owned farms had only 32.8 percent, and rented farms only 27.6 percent.

The above data and that in the following paragraph will be found in Table 2, page 8.

Since the owned land on part-owned farms is made up primarily of headquarters tracts, and the rented land made up of tracts other than headquarters, there was a larger share of the owned land in grasses and legumes. About 42 percent of the owned tillable land was in corn and soybeans, about 11 percent was in small grain, and approximately 45 percent was in grasses and legumes; while about 62 percent of the rented tillable land was in corn and soybeans, about 12 percent was in small grain, and only 23 percent was in grasses and legumes.

Tracts per farm as related to tenure. The average number of tracts per farm was 3.2 (Table 3). The part-owned group averaged 4.1 tracts, the rented group 3.0 tracts, and the owned group 1.6 tracts per farm. About 57 percent of owned farms had only one tract of land, while 26.5 percent of rented farms and none of the part-owned farms consisted of only one. About 43 percent of the owned farms, 59 percent of the rented farms, and 65 percent of the part-owned farms had from two to four tracts of land. About 15 percent of the rented farms and 35 percent of the part-owned farms had five or more tracts.¹

The lower activity of the operators who owned their farms, as already pointed out, accounts for the relatively small number of tracts per farm in that group. Because part-owned farms usually have a smaller headquarters tract than rented farms, it is necessary for operators of these farms to rent more tracts other than headquarters in order to have a comparable size of farming unit.

Size of tracts as related to tenure. Headquarters tracts, averaging 103 acres, were considerably larger than tracts other than headquarters, which averaged 46.6 acres (Table 3). The average headquarters tract on rented farms comprised 157.9 acres, on owned farms 116.4 acres, and on part-owned farms 78.1 acres.

¹If all contiguous tracts were considered as one unit, the number of tracts per farm would be reduced from 3.0 to 2.8 on rented farms, from 4.1 to 3.7 on part-owner farms, and from 3.2 to 2.8 on all 198 farms surveyed.

The average size of tracts other than headquarters varied less than did the headquarters tracts. The average tract of 54.3 acres on owned farms was only slightly larger than the average tract on part-owned and rented farms of 46.8 and 42.1 acres respectively. This difference is probably due to the fact that woods and wasteland are included with the owned tracts while part-owners and renters who rent tracts other than headquarters generally rent only that part of the ownership unit that can be used for crop production.

Factors influencing tenure pattern. The preceding analysis shows the complexity of farm tenure in the claypan region. This complexity exists because the majority of the farmers in the area, being part-owners, operate several tracts of land that either are not contiguous or, if contiguous, are located on different ownership units. Many influences, several of which are quite evident and others of which are not easily discernible, are responsible for the present tenure pattern.

Since many operators or their widows choose, in later life, to remain in a semiretired status on the land they own, and rent part of it rather than sell it, there are a large number of ownership units on which fields are rented out to one or several operators. Part-time farmers often operate part of the land they own and rent out the rest of it.

Most absentee landowners in Wayne county fall into two general classifications. Those in one group rent out their land as a farming unit, expect an income from it, and help the tenant in organizing a profitable farming program.

Another group of owners retain title to their land even though they obtain little or no agricultural income from it. They do this because oil wells are common in Wayne county and they feel there is a reasonable possibility of oil being discovered on their property, and perhaps for other reasons. Some of them let local people live in the farmhouse and have what they produce on the land, or they give them the privilege of subrenting the land in return for their taking care of any business connected with the farm or for paying taxes on it. When there is no farmhouse, some owners give nearby operators what they can produce on the land, or the privilege of subrenting it, for performing the same service. Others rent out fields to nearby operators on a share basis without too much concern about returns. So long as this situation exists there is likely to be a complex tenure pattern on a large percentage of the land belonging to absentee owners.

Recent trend in tenure. Although field-renting has been a common practice in Wayne county for several decades, a noticeable increase in the percentage of farms that are part-owned indicates that in recent years the tenure pattern has become more complex. According to the U. S. Census, about 33 percent of Wayne county farms were part-

owned in 1930, about 34 percent in 1940, and nearly 43 percent in 1945. More than 50 percent of the survey farms were in this category in 1948. This increase is probably attributable more to mechanization than to any other single factor. Many younger farmers who have accumulated savings in recent years have invested their money in machinery and equipment in preference to buying land, and have rented several tracts in addition to the land they own in order to make more effective use of their machinery and equipment, thereby increasing the average number of tracts per farm.

Advantages and disadvantages of present tenure practices. A claypan farmer who operates two or more tracts of land has at least three disadvantages that one who is in a position to confine his operations solely to one tract does not have: (1) He must spend considerable time traveling to work, moving equipment from one tract to another, and hauling grain and hay he intends to feed or store to the headquarters tract. (2) As he may rent several tracts for only one season, it is difficult for him to plan a complete farming program for a period longer than a year. (3) As he rents from more than one landowner, he must make several different renting agreements.

Despite these and other disadvantages, most operators who farm additional tracts have increased their incomes considerably by doing so because they have thereby been able to make more effective use of their available labor and machinery. Field renting is attractive to farmers because it does not require a cash outlay for the land, buildings, or equipment that would be needed in a program built around intensive enterprises such as poultry or dairy.

SOIL-TYPE CLASSES IN WAYNE COUNTY¹

Preliminary analysis and observation indicated that soils in Wayne county could be grouped into five soil-type classes. Two classes include only one type, and three classes include two or more soil types. Soil types in the same class have approximately the same slope, about the same productive capacity, and similar erosion and management problems. Operators usually do not distinguish one from another for farming purposes. The amounts of land in these different soil-type classes in Wayne county and in the farms surveyed are shown in Tables 4 and 5.

Bottomland soils. The seven soil types that make up the bottomland class cover nearly 27 percent of Wayne county and account for a little over 29 percent of the land on the farms surveyed. They are

¹ For a more detailed description of soil-type classes, see Wayne County Soils, Ill. Agr. Exp. Sta. Soil Report 49, 1931.

usually flat, have poor natural drainage, are subject to occasional overflow on the upper levels and frequent overflow on the lower levels, and are often covered by backwater during the winter and spring months. In some localities where these soils are so poorly drained that they are not cropped, swamps are found and the land is covered with brush or timber.

Gently sloping timber soils. The soil mapped as "No. 13, Gray silt loam on compact medium-plastic clay" in the Wayne county soil report is referred to as Bluford silt loam in the present study. This upland timber soil covers about 27 percent of the area of the county and about 23 percent of the area of the sample farms. There is considerable variation in slope, and serious erosion is common where needed conservation practices are not followed.¹ Surface drainage is good and subsurface drainage is fair.

Poorly drained flat upland and terrace soils.² Poorly drained flat upland and terrace soils are practically level. Characterized by exceptionally poor surface drainage and underdrainage, they account for approximately 21 percent of the county area and 23 percent of the area on the sample farms. Shallow ponds stand on the land in winter or spring when the weather is wet, and plants suffer extremely from lack of water when several summer days pass without precipitation. Because of the poor drainage, it is difficult to obtain good stands of alfalfa and some of the clovers on soils in this class.

Gently sloping prairie soils. Gently sloping prairie soils, made up of Hoyleton and Richview silt loams, comprise approximately 17 percent of the county area and 16 percent of the area on the farms surveyed. They slope more than the soils of any of the other soil-type classes except gently sloping timber and steep and eroded soils. Because of the slope and poor underdrainage, these soils are subject to serious erosion when preventive measures are not used.

Steep and eroded soils. Steep and eroded soils, covering about 8 percent of Wayne county and 8 percent of the area of the farms surveyed, very adequately describe Hickory loam, which is the only soil type included in this class. All this type is subject to destructive

¹ In present soil-survey classification the type mapped as "No. 13, Gray silt loam on compact medium-plastic clay" in the county soil report would include Bluford silt loam with slopes of 1.5 to 3.5 percent and Ava silt loam with slopes of 3.5 to 7 percent. For detailed information on these and other soil types, see AG-1443, Illinois Soil Type Descriptions [processed]. 1950.

² In this soil-type class, upland soils are much more extensive than terrace soils. Hereafter in this publication, the class "poorly drained flat upland and terrace soils" is referred to as "poorly drained flat upland soils." Farms on which these soils are predominant are referred to as "flat upland farms."

Table 4. — Soil Types Comprising Five Classes of Soils in Wayne County, Illinois*

Classes, type numbers, and names	Percent of county	Classes, type numbers, and names	Percent of county
Bottomland soils		Poorly drained flat upland and terrace soils	
No. 108 Bonnie silt loam....	23.97	No. 2 Cisne silt loam.....	7.24
“ 72 Sharon loam.....	1.78	“ 12 Wynoose silt loam..	6.59
“ 84 Okaw silt loam....	.75	“ 11 Loy silt loam.....	.02
“ 70 Beaucoup silty clay loam.....	.83	“ 10 Deep gray silt loam*.	3.08
“ 71 Beaucoup clay.....	.07	“ 1 Rinard silt loam*...	1.68
“ 75 Drury silt loam....	.03	“ 48 Ebbert silt loam*...	1.19
“ 92 Perks sand.....	.02	“ 26 Wagner silt loam*...	1.08
Total.....	27.45	Total.....	20.88
Gently sloping timber soils		Steep and eroded soils	
No. 13 Bluford silt loam...	26.72	No. 8 Hickory loam.....	7.83
Gently sloping prairie soils			
No. 3 Hoyleton silt loam....	15.77		
“ 4 Richview silt loam....	1.35		
Total.....	17.12		

* Compiled from Soil Report 49, Wayne County Soils, Ill. Agr. Exp. Sta. After Soil Report 49 was published, names of soil types were changed to those shown here.

* Soil types that occur on stream terraces.

erosion. Where the original covering of timber has been removed and the land has been cultivated, gullies as deep as 15 feet are not uncommon. Most of this type is best suited to timber, but if special precautions are taken, some of the less rolling slopes can be used for pasture.

Table 5. — Acres and Percentages of Five Classes of Soil Types on Sample Farms and in Wayne County as a Whole

Soil-type class	Sample farms ^a		Wayne county	
	Acres	Percent	Acres	Percent
Bottomland soils.....	11,746	29.39	124,512	27.45
Gently sloping timber soils.....	9,379	23.46	121,146	26.72
Poorly drained flat upland and terrace soils.....	9,181	22.97	94,617	20.88
Gently sloping prairie soils.....	6,531	16.34	77,638	17.12
Steep and eroded soils.....	3,135	7.84	35,520	7.83
All classes.....	39,972 ^b	100.00	453,433	100.00

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b There were actually 40,547 acres in the farms surveyed. Farms with land in both Wayne and an adjoining county were included in the sample if 50 percent or more of their acreage was in Wayne county. Parts of farms, totaling 575 acres, were in adjoining counties, and the soil types on this acreage were not ascertained.

GROUPING OF SAMPLE FARMS

With the soil-type class used as a basis, 194 of the 198 sample farms were divided into six different groups as indicated in Table 6 and as described below.

Each farm was located on the soil map and the approximate acreage of each soil type ascertained. The four remaining farms, which had 55 percent or more of their area in steep and eroded soils, were not included in the analysis as a separate group because they are representative of only a small number of farms in the county, and furthermore averages of items from only four farms would not be of much significance statistically.

The main purpose of the rest of this report is to present an analysis and comparison of the farming programs on these six groups of farms.

Bottomland farms. Each farm in this class had 55 percent or more of its area in bottomland soils. The average bottomland farm had about 70 percent in these soils.

Timber soil farms. Each timber soil farm had 55 percent or more of its area in gently sloping timber soils. The average farm in this group had about 66 percent of its area in these soils.

Flat upland farms. Each farm in this group had 55 percent or more of its area in poorly drained flat upland soils, or in these soils and gently sloping prairie soils, but the flat upland soils made up a larger percentage of the total farm area than the sloping prairie soils. The average flat upland farm had about 57 percent of its area in poorly drained flat upland soils.

Prairie soil farms. Each prairie soil farm had 55 percent or more of its area in gently sloping prairie soils, or in these soils and poorly drained flat upland soils, but the sloping prairie soils made up a larger percentage of the total farm area than the flat upland soils. The average prairie soil farm had about 67 percent of its area in gently sloping prairie soils.

Bottomland-upland farms. All these farms had a higher percentage of their area in bottomland soils than in any other class of soil types, but on no farm was the percentage more than 55. The average bottomland-upland farm had about 41 percent of its acreage in bottomland soils.

Mixed-upland farms. All these farms had a higher percentage of their area in gently sloping timber soils than in any other class of soil types, but on no farm was the percentage more than 55. The average mixed-upland farm consisted of about 39 percent gently sloping timber soils.

Table 6. — Acres and Percentage of Land per Farm in Five Classes of Soils on Six Groups of Sample Farms*

Soil-type class	Bottomland farms (30)		Timber soil farms (30)		Flat upland farms (33)		Prairie soil farms (27)		Bottomland-upland farms (35)		Mixed upland farms (39)		All farms (198) ^b	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Bottomland soils.....	197.9	70.4	12.4	9.8	15.1	7.0	5.6	3.6	101.0	40.6	29.0	14.6	59.3	29.0
Gently sloping timber soils..	33.4	11.9	83.8	66.1	28.9	13.4	10.2	6.5	44.7	18.0	76.2	38.5	47.4	23.1
Poorly drained flat upland soils.....	19.8	7.0	14.0	11.1	122.3	56.8	32.3	20.5	46.6	18.7	41.5	21.0	46.4	22.7
Gently sloping prairie soils..	17.2	6.1	2.8	2.2	44.0	20.5	104.8	66.7	20.3	8.2	24.1	12.2	33.0	16.1
Steep and eroded soils..	12.9	4.6	13.7	10.8	4.9	2.3	2.9	1.8	24.9	10.0	23.3	11.8	15.8	7.7
Soil type class unknown ^c.....	.....	.....	.....	.....	.....	.....	1.4	.9	11.2	4.5	3.7	1.9	2.9	1.4
All classes....	281.2	100.0	126.7	100.0	215.2	100.0	157.2	100.0	248.7	100.0	197.8	100.0	204.8	100.0

* Farm survey, Wayne county, 1948. All farms include 30 acres or more.

^b Four farms are included here that are not included in any of the six groups. Steep and eroded soils comprise 55 percent or more of the area of these four farms.

^c Ten farms had some land outside Wayne county, and the soil types on this land were not ascertained.

Table 7. — General Characteristics of Six Groups of Sample Farms*

Item	Bot- tom- land farms (30)	Tim- ber soil farms (30)	Flat upland farms (33)	Prairie soil farms (27)	Bot- tom- land- upland farms (35)	Mixed upland farms (39)	All farms (198) ^b
Acres per farm							
Owned.....	127.6	77.9	104.3	84.8	120.1	86.0	100.7
Rented.....	153.6	48.8	110.9	72.4	128.6	111.8	104.1
Total.....	281.2	126.7	215.2	157.2	248.7	197.8	204.8
Percentage of acres tillable..	78.1	86.5	89.9	89.4	76.0	82.1	82.2
Tenure of farms							
Owned farms, percent....	30.0	43.3	30.3	37.0	14.3	23.1	29.3
Rented farms, percent....	33.3	3.3	18.2	7.4	20.0	20.5	17.2
Part-owned farms, percent	36.7	53.4	51.5	55.6	65.7	56.4	53.5
Tracts per farm.....	3.0	2.9	3.2	2.9	3.5	3.3	3.2
Average size of tracts							
Headquarters, acres.....	142.5	78.2	116.2	88.6	100.0	95.6	102.6
Other tracts, acres.....	69.3	26.0	44.1	35.6	58.5	44.3	57.5
All tracts, acres.....	93.7	44.2	66.4	53.7	70.2	59.8	64.4
Average age of operator....	45	46	44	46	44	43	45
Crop yields per acre							
Corn, ^c bushels.....	43	39	38	41	41	42	41
Soybeans, bushels.....	17	18	16	16	19	16	17
Wheat, bushels.....	16	14	11	12	19	14	15
Livestock per farm^d							
Milk cows, number.....	2.6	2.2	3.5	2.6	3.6	3.5	3.0
Other cattle, number.....	10.8	8.8	11.1	7.4	16.6	9.8	10.9
Brood sows, number.....	2.5	1.2	1.9	.8	2.1	1.4	1.7
Other hogs, number.....	17.0	10.0	11.3	6.1	15.4	9.3	11.5
Laying hens, number.....	145.5	139.1	132.6	114.9	168.3	142.7	140.6
Tractors							
Farms with.....	26	19	25	16	30	24	142
Farms without.....	4	11	8	11	5	15	56
Tractors per farm.....	1.3	.8	.9	.6	1.1	.7	.9
Labor per farm per year^e							
Operator's, months.....	10.5	8.1	10.4	8.9	10.7	11.3	10.1
Family, months.....	3.9	2.9	3.6	3.0	4.3	3.3	3.5
Hired, months.....	3.5	.5	2.9	.6	1.9	1.9	1.9
Total.....	17.9	11.5	16.9	12.5	16.9	16.5	15.5

* Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b Four farms are included here that are not included in any of the six groups, as explained in footnote b, Table 6.

^c Corn yields were exceptionally high in Wayne county in 1948. According to the Illinois Crop-Reporting Service, the average for the five-year period 1935-1939 was 36 bushels.

^d Livestock included in ending inventory.

^e Hours of labor done by the family were recorded in terms of man-labor equivalent. Each farmer was asked by the enumerator to give the number of hours it would have taken a man to perform the amount of work done by individuals in these classes.

SIZE OF FARM AND TENURE AS RELATED TO SOILS

The general features of the six groups of farms are summarized in Table 7.

The average size of all farms surveyed was 204.8 acres, varying from 126.7 acres for the timber soil farms to 281.2 acres for the bottomland farms. The prairie soil farms, with 157.2 acres, were next to the smallest in size, and were similar to timber soil farms in other general features. Bottomland-upland farms were above average in size, with 248.7 acres. Flat upland and mixed upland farms, with 215.2 and 197.8 acres respectively, were about average in size.

Only on timber and prairie soil farms did the acreage of owned land exceed the acreage rented. In these two groups only 3 out of 57 farms were entirely rented, although 31 of the 57 operators rented a part of the land they operated. Ten of the 30 bottomland farms were entirely rented—a much higher proportion than in any other group. On flat upland, bottomland-upland, and mixed upland farms about one farm in five was entirely rented. Operators of the two latter groups, and of bottomland-upland farms in particular, showed the greatest tendency to rent additional tracts of land to increase the size of their business. Only 14.3 percent of the operators of bottomland-upland farms owned all of the land they operated; 65.7 percent owned part and rented part.

LAND USE ON SAMPLE FARMS

The percentage of land classed by these farmers as tillable varied from about 75 on bottomland and bottomland-upland farms to about 90 on flat upland, sloping timber soil, and sloping prairie soil farms (Table 7). In bottomland areas a good deal of the land is too wet for cultivation and has not been cleared. On upland farms, land classed as nontillable is mainly steep land that has not been cleared or rolling land that is seriously eroded as a result of past cultivation. Some of this land is used for pasture but much of it is now covered by brush and small trees.

Data concerning corn, soybeans, and small grain, cited in the following paragraphs, will be found also in Table 8. Data on grasses and legumes appears in both Tables 8 and 9.

Corn and soybeans. Corn and soybeans were grown on 59.5, 51.7, and 46.9 percent, respectively, of the tillable land on bottomland, bottomland-upland, and flat upland farms; and 44.1, 42.8, and 33.0 percent on the mixed upland, prairie soil, and timber soil farms. Corn acreages ranged from 26.9 on the timber soil farms to 68.5 on the bottomland-upland farms, and soybean acreages ranged from 9.2 on the timber soil farms to 69.0 on bottomland farms.

Table 8. — Land Use per Farm on Six Groups of Sample Farms^a

Use of land	Bottomland farms (30)		Timber soil farms (30)		Flat upland farms (33)		Prairie soil farms (27)		Bottomland-upland farms (35)		Mixed upland farms (39)		All farms (198) ^b	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Tillable land in—														
Corn.....	61.6	28.1	26.9	24.6	60.0	31.0	38.2	27.2	68.5	36.2	46.3	28.5	50.2	29.8
Soybeans.....	69.0	31.4	9.2	8.4	30.8	15.9	21.9	15.6	29.3	15.5	25.3	15.6	30.5	18.1
Total.....	130.6	59.5	36.1	33.0	90.8	46.9	60.1	42.8	97.9	51.7	71.6	44.1	80.7	47.9
Small grain..	24.1	11.0	15.3	14.0	16.4	8.5	5.9	4.2	24.5	13.0	19.5	12.0	17.8	10.6
Grasses and legumes....	52.3	23.8	55.7	50.8	81.1	41.9	65.1	46.3	59.9	31.7	63.6	39.2	62.8	37.3
Idle.....	12.1	5.5	1.8	1.6	4.8	2.5	9.3	6.6	6.8	3.6	7.3	4.5	6.8	4.0
Miscellaneous ^d	.5	.2	.7	.6	.3	.2	.2	.1	.....	.....	.3	.2	.3	.2
Total tillable land	219.6	100.0	109.6	100.0	193.4	100.0	140.6	100.0	189.1	100.0	162.3	100.0	168.4	100.0
Nontillable land in—														
Pasture.....	12.9	.....	2.7	.....	3.8	.....	7.2	.....	23.7	.....	15.9	.....	12.0	.....
Other.....	48.7	.....	14.4	.....	18.0	.....	9.4	.....	35.9	.....	19.6	.....	24.4	.....
Total nontillable land.....	61.6	.....	17.1	.....	21.8	.....	16.6	.....	59.6	.....	35.5	.....	36.4	.....
Total land.....	281.2	.....	126.7	.....	215.2	.....	157.2	.....	248.7	.....	197.8	.....	204.8	.....

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.^b Four farms are included here that are not included in any of the six groups, as explained in footnote b, Table 6.^c Includes cowpeas.^d Includes buckwheat, cane, milo maize, orchards, popcorn, and sunflowers.

Table 9. — Amount of Tillable Land per Farm Used for Hay and Pasture on Six Groups of Sample Farms^a

Hay and pasture	Bottomland farms (30)		Timber soil farms (30)		Flat upland farms (33)		Prairie soil farms (27)		Bottomland-upland farms (35)		Mixed upland farms (39)		All farms (198) ^b	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Grasses or lespedeza.....	40.4	71.2	52.9	94.5	75.9	87.6	70.7	90.1	51.9	84.5	53.7	77.8	56.6	84.2
Alfalfa or clover ^c	11.9	21.0	2.8	5.0	5.2	6.0	4.1	5.2	3.6	5.9	9.9	14.4	6.2	9.2
Other.....	4.4	7.8	.3	.5	5.5	6.4	3.7	4.7	5.9	9.6	5.4	7.8	4.4	6.6
Total.....	56.7	100.0	56.0	100.0	86.6	100.0	78.5	100.0	61.4	100.0	69.0	100.0	67.2	100.0

Number of farms with kinds of hay and pasture indicated							
Grasses or lespedeza.....	24	27	30	26	29	33	173
Alfalfa or a clover mixed.....	7	2	7	8	9	11	45

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b Four farms are included here that are not included in any of the six groups, as explained in footnote b, Table 6.

^c Includes soybeans (and cowpeas), small grain, and miscellaneous crops that were not used for hay and pasture. In other tables these crops were included with soybeans (and cowpeas), small grain, and miscellaneous crops, respectively.

^d Refers to clovers other than lespedeza.

Roughly twice as many acres of corn as of soybeans were planted per farm on each group of farms except the bottomland group, which had more soybeans than corn. This is probably because quite a large part of the bottomland does not dry out early enough in the spring to be planted to corn but does dry out early enough to be seeded to soybeans.

Except for a few acres used for silage, practically all the corn grown was harvested as grain. About 10 percent of the soybean acreage was used for hay, pasture, or green manure.

Small grains. Wheat and oats were the main small-grain crops grown on these 198 sample farms, about three times as many acres of wheat being grown as oats. A few acres of barley and rye were found. Land in small grain ranged from 5.9 acres on prairie soil farms to 24.5 acres on bottomland-upland farms.

Grasses and legumes. Although the acres of grasses and legumes per farm ranged only from 52.3 on the bottomland group to 81.1 on the flat upland group, the percentage they made up of the total tillable acres varied considerably. On the timber soil, mixed upland, prairie soil, and flat upland soil farms, they accounted for 39 to 51 percent of the tillable acreage; on the bottomland and bottomland-upland farms, for about 24 and 32 percent respectively.

The average farm had 67.2 acres of hay and tillable pasture. Acres per farm ranged from 56.0 on farms in the timber soil group to 86.6 in the flat upland group.

Grass, lespedeza, or a mixture of the two was used on 173 farms and accounted for about 84 percent of the acres in hay and tillable pasture. Lespedeza thrives better on untreated, poorly drained claypan soils than does clover. Practically all the grass produced was redtop. This is the predominant grass throughout the claypan region because it grows well on untreated, poorly drained acid soils, though this is not to say that redtop and lespedeza do not do better if the soil is properly treated and drained. Only 16 of the 198 farmers interviewed harvested redtop seed in 1948. It is doubtful, however, whether 1948 can be looked upon as a typical year for the production of this crop. Several farmers stated that they had intended to harvest seed but could not do so because of heavy rains during the harvesting season. If the season had been more favorable, probably 40 or 50 operators would have harvested redtop seed in 1948.¹

Forty-five farms grew alfalfa or clover mixtures or both. These mixtures accounted for about 9 percent of the hay and tillable-pasture acreage on the average farm. Acres of mixed alfalfa or clover

¹ For a more detailed description of redtop production in the claypan region see: Burlison, W. L., Stewart, C. L., Ross, R. C., and Whalin, O. L., *Production and Marketing of Red Top*. Ill. Agr. Exp. Sta. Bul. 404. 1934.

Table 10. — Use of Total Acres of Tillable Land in Five Soil-Type Classes^a

Use of land	Bottomland soils		Gently sloping timber soils		Gently sloping flat upland soils		Gently sloping prairie soils		Steep and eroded soils		Soil type unknown ^b		All soils	
	Acres	Per cent	Acres	Per cent	Acres	Per cent	Acres	Per cent	Acres	Per cent	Acres	Per cent	Acres	Per cent
Tillable land in—														
Corn.....	3,384	39.2	1,614	21.0	2,737	32.7	1,568	25.7	298	17.6	140	25.9	9,741	29.5
Soybeans ^c	2,555	29.6	830	10.8	1,528	18.2	889	14.6	137	8.1	72	13.3	6,011	18.2
Total.....	5,939	68.8	2,444	31.8	4,265	50.9	2,457	40.3	435	25.7	212	39.2	15,752	47.7
Small grains.....	579	6.7	1,203	15.6	827	9.9	619	10.2	221	13.0	47	8.7	3,496	10.6
Grasses and legumes..	1,655	19.2	3,838	49.8	2,967	35.5	2,710	44.4	938	55.4	272	50.3	12,380	37.5
Idle.....	453	5.2	180	2.3	299	3.6	305	5.0	98	5.8	10	1.8	1,345	4.0
Miscellaneous ^d	11	.1	37	.5	7	.1	6	.1	1	.1	..	..	62	.2
Total tillable land..	8,637	100.0	7,702	100.0	8,365	100.0	6,097	100.0	1,693	100.0	541	100.0	33,035	100.0
Percent of total land tillable.....	.....	74.9	.....	83.1	.....	91.2	.....	94.5	.....	55.5	.....	94.1	.....	82.5

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres. Four farms were not included in this analysis because fields on these farms could not be accurately located on the soil map, leaving 194 farms as total in the analysis.

^b Ten farms included some land outside Wayne county, and the soil-type classes for this land were not ascertained.

^c Includes cowpeas.

^d Includes buckwheat, cane, milo maize, orchard, popcorn, and sunflowers.

varied from 2.8 per farm on the timber soil farms to 11.9 on the bottomland farms. The larger acreage of alfalfa and clover mixtures on the bottomland group than on the other five groups is largely attributable to alsike and ladino clovers grown on upper-level bottomland soils.

A number of farmers used soybeans, cowpeas, or small grain for hay and pasture. These crops accounted for about 7 percent of the hay and tillable pasture on the average farm. In general, farms with major soil types best adapted to soybeans had a higher percentage of hay land in "other crops" than did farms with major soil types not so adapted. While timber soil and prairie soil farms had approximately 0.5 and 4.7 percent, respectively, of hay and tillable pastureland in other crops, the other four groups had from 6.4 to 9.6 percent.

Land use by soil-type classes. This section has been concerned primarily with a comparison of land-use programs on six groups of farms classified according to the predominant soil type on the farm. The adaptation of different crops to particular soil types is shown more clearly when land use is related to soil types rather than to farm units on which particular soil types predominate. These data are shown in Tables 10 and 11.

Bottomland soils are obviously well suited to corn and soybeans. Over two-thirds of all tillable bottomland in the survey was in these two crops. Soybeans are particularly well adapted to bottomland because they can be planted late in the spring on soils that dry out too

Table 11.—Proportion of Different Crops Grown on Tillable Land of Five Soil-Type Classes in Sample Farms^a

Use of land	Bot- tom- land soils	Gently sloping timber soils	Poorly drained flat upland soils	Gently sloping prairie soils	Steep and eroded soils	Soil type un- known ^b	All soils
	<i>perct.</i>	<i>perct.</i>	<i>perct.</i>	<i>perct.</i>	<i>perct.</i>	<i>perct.</i>	<i>perct.</i>
Corn.....	34.7	16.6	28.1	16.1	3.1	1.4	100.0
Soybeans ^c	42.5	13.8	25.4	14.8	2.3	1.2	100.0
Small grain.....	16.6	34.4	23.7	17.7	6.3	1.3	100.0
Grasses and legumes...	13.4	31.0	24.0	21.9	7.5	2.2	100.0
Idle.....	33.7	13.4	22.2	22.7	7.3	.7	100.0
Miscellaneous ^d	17.7	59.7	11.3	9.7	1.6	...	100.0
All tillable land.....	26.2	23.3	25.3	18.5	5.1	1.6	100.0

^a Farm survey, Wayne county, 1948. All farms included 30 acres or more. Four farms were not included in this analysis because fields on these farms could not be accurately located on the soil map, leaving 194 farms as the total in this analysis.

^b Includes parts of farms that were located in neighboring counties.

^c Includes cowpeas.

^d Includes buckwheat, cane, milo maize, orchards, popcorn, and sunflowers.

late to be planted to corn. Soybeans were grown on about 30 percent of the bottomland acreage, a much higher percentage than on any other soil type. Although bottomland made up only 26.2 percent of all tillable land in the sample farms, 42.5 percent of the total soybean acreage was on this land. Because it is wet and subject to overflow, bottomland is not well suited to small grains and standover legumes and grasses. The percentage of bottomland in these crops was lower than for any other soil types.

Poorly drained flat upland soils are also relatively well adapted to corn and soybeans. Half the tillable area of these flat soils was in the two crops. In contrast, less than one-third of the tillable area of gently sloping timber soils was in corn and soybeans and about half was in grasses and legumes for hay and pasture. These upland timber soils made up 23.3 percent of all tillable land in the survey but were growing only 16.6 percent of the total corn acreage and 13.8 percent of the soybean acreage. On the other hand, they were growing about one-third of the total acreages of small grains and of grasses and legumes. Wheat is well adapted to sloping timber soils because such soils are better drained and wheat is not so likely to "freeze out" in the winter. Wheat also provides winter cover to protect the sloping soils from erosion.

LAND MANAGEMENT AND CROPPING PLANS

Cropping plans. Only 60 of the 198 farmers interviewed indicated that they followed a systematic crop rotation on part or all of their tillable land. There are a number of reasons for this situation.

The land farmed as a unit includes typically more than one major soil type. Tenure is complex, multiple tracts and field-renting being common. Soybeans had been an important crop only in recent years and on many farms had not yet been worked into definite rotations. Each of these factors adds to the difficulty of establishing systematic cropping plans.

A more or less regular shifting of upland fields from row crops and small grains to hay and pasture was reported on most farms as a means of maintaining fertility. Cropping plans that approach definite rotations were most frequently reported on headquarters tracts and on farms where all the land was owned by one person, either the operator or the landlord. Extremes in land use were frequent, particularly on part-owner farms. On many of these farms all or a high proportion of the owned land was in hay and pasture. Livestock were kept on this land and fed grains produced on rented land. Corn yields of 70 to 90 bushels an acre were reported on some fields of owned land that had been operated in this manner for a number of years. At the other extreme were some rented fields that had been in continuous row crops until yields had dropped to a very low level.

Table 12. — Treatment of Land in Intertilled and Small-Grain Crops and in Grasses and Legumes on Six Groups of Sample Farms^a

Treatment	Intertilled and small-grain crops			Intertilled and small-grain crops		
	Grasses and legumes	All tillable land		Grasses and legumes	All tillable land	
	Bottomland farms			Timber soil farms		
	<i>perct.</i>	<i>perct.</i>	<i>perct.</i>	<i>perct.</i>	<i>perct.</i>	<i>perct.</i>
Limestone only ^b	8.7	42.6	16.8	14.8	26.2	20.6
Fertilizer only ^c	16.4	.9	12.7	25.8	....	12.6
Limestone and fertilizer ^d ...	19.4	8.9	16.9	35.2	13.6	24.3
No treatment.....	55.5	47.6	53.6	24.2	60.2	42.5
Total.....	100.0	100.0	100.0	100.0	100.0	100.0
	Flat upland farms			Prairie soil farms		
Limestone only ^b	21.1	36.9	27.7	25.4	34.8	29.7
Fertilizer only ^c	18.1	.3	10.6	13.9	....	7.5
Limestone and fertilizer ^d ...	29.9	3.8	19.0	28.2	3.2	16.6
No treatment.....	30.9	59.0	42.7	32.5	62.0	46.2
Total.....	100.0	100.0	100.0	100.0	100.0	100.0
	Bottomland-upland farms			Mixed upland farms		
Limestone only ^b	17.7	36.4	23.6	21.6	28.8	24.4
Fertilizer only ^c	21.0	1.3	14.8	16.3	.6	10.1
Limestone and fertilizer ^d ...	29.5	16.1	25.2	34.1	5.7	23.0
No treatment.....	31.8	46.2	36.4	28.0	64.9	42.5
Total.....	100.0	100.0	100.0	100.0	100.0	100.0
	All farms					
Limestone only ^b	17.5	34.4	23.8	....	....	....
Fertilizer only ^c	18.1	.5	11.6	....	....	....
Limestone and fertilizer ^d ...	28.1	8.1	20.6	....	....	....
No treatment.....	36.3	57.0	44.0	....	....	....
Total.....	100.0	100.0	100.0	....	....	....

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b Had received applications of limestone within the last ten years.

^c Complete fertilizer in row in 1948; or phosphate, potash, or complete fertilizer broadcast in 1948 or within the last five years; or combinations of all or part of these materials.

^d Had received applications of limestone within the last ten years and fertilizer in the row in 1948 or complete fertilizer, phosphate, or potash broadcast in 1948 or within the last five years; or an application of limestone within the last ten years and a combination of part or all of the materials mentioned.

Drainage and erosion control. Most of the farms surveyed had both drainage and erosion problems. Soil permeability is very slow; water stands on level areas, and runoff is rapid on sloping areas. With only small differences in slope, the problem may change from one of drainage to one of erosion control.

The conventional and evidently most satisfactory method of getting standing water off claypan farmland is by bedding and open drainage ditches. Tiling and subsoiling are practically nonexistent in Wayne county. Much of the land cannot be well drained because there is no outlet for the water or the cost of making an outlet is prohibitive. Where better drainage had been accomplished on the survey farms, crop yields were much higher than on similar land not so well drained.

Leaving steep slopes in grass and doing a small amount of contour farming were the only erosion-control practices on the farms surveyed. At the time of the survey Wayne was one of the few Illinois counties in which soil-conservation districts had not been organized.

Soil treatment. Very few of the farms surveyed had complete or adequate soil-treatment programs. On all farms 44.4 percent of all tillable land had been limed within the last ten years, and about half this limed land had received applications of commercial fertilizer (mainly mixed fertilizer) within the last five years. Forty-four percent of all tillable land had received no limestone or commercial fertilizer within these periods. On bottomland farms over 50 percent of the tillable land was untreated (Table 12).

As a general average, grain yields on land that had been limed and treated with commercial fertilizer were about 50 percent higher than on untreated land (Table 13).

Since rates of limestone and fertilizer treatments and previous land use were not recorded in the survey, the data summarized in Tables 12 and 13 are only a very general indication of soil-treatment programs in 1948 and of the effects of treatments on yields.

Table 13.— Yields of Major Grain Crops Under Different Fertilizer Treatments on all 198 Sample Farms^a

Crop	No	Fertilizer ^c	Limestone ^b	Limestone and
	treatment			fertilizer ^d
	<i>bu.</i>	<i>bu.</i>	<i>bu.</i>	<i>bu.</i>
Corn	32.7	34.7	42.8	50.7
Soybeans	14.1	18.7	17.3	20.0
Oats	12.9	15.0	16.4	18.6
Wheat	9.8	12.0	12.4	17.1

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.
^{b, c, d} See footnotes b, c, d, in Table 12.

GRAIN RAISED, SOLD, AND FEED BOUGHT¹

Grain production. Differences between the groups of farms in the production of corn and soybeans are attributable mainly to differences in acreages. Average yields per acre were nearly the same for all groups (Table 7). Corn produced per farm varied from an average

Table 14.—Grain Produced on and Sold from Six Groups of Sample Farms^a

Crop	Bot- tom- land farms (30)	Tim- ber soil farms (30)	Flat upland farms (33)	Prairie soil farms (27)	Bot- tom- land- upland farms (35)	Mixed upland farms (39)	All farms (198 ^b)
Production per farm (bushels)							
Corn.....	2,387	1,052	2,257	1,517	2,675	1,939	1,976
Soybeans.....	1,132	168	395	296	517	343	465
Wheat.....	385	150	107	36	301	161	185
Oats.....	10	77	109	39	68	95	67
Sold or given as share rent (bushels per farm)							
Corn.....	1,253	381	1,405	869	1,380	1,031	1,052
Soybeans.....	1,015	151	346	265	483	291	416
Wheat.....	285	111	89	26	241	127	147
Oats.....	.....	15	50	9	43	36	27
Number of farms producing crops indicated							
Corn ^c	28	25	32	25	34	38	185
Soybeans ^d	23	10	18	13	24	22	113
Wheat ^e	15	15	13	5	24	17	90
Oats ^f	1	9	11	3	10	9	43

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b Four farms are included here that are not included in any of the six groups, as explained in footnote b, Table 6.

^c Does not include corn for silage.

^d Includes only soybeans combined and threshed.

^e Includes only wheat combined and threshed.

^f Includes only oats combined and threshed.

of 2,675 bushels on bottomland-upland farms to 1,052 bushels per farm on timber soil farms (Table 14). Soybeans produced per farm varied from 1,132 bushels on bottomland farms to 168 bushels on timber soil

¹ When the Wayne county survey was taken, farmers were not asked to estimate hay production or pasture yields. According to the Illinois Crop-Reporting Service, the average yield of tame hay in Wayne county in 1948 was about a ton an acre.

farms. Wheat was produced on less than half of all farms, but on some of these farms it was an important crop.

Grain sold. Slightly more than half of all corn produced was sold or given as share rent (Table 14). The proportion of the corn crop sold or given as share rent was about two-thirds on flat upland farms and about one-third on timber soil farms. Wheat and soybeans are primarily cash crops, as indicated by the high proportion of these crops that was sold or given as rent.

Corn yields were relatively high in 1948 throughout the claypan area. The average yield was 41 bushels per acre on survey farms, compared with a five-year average (1945-49) of 36 bushels for Wayne county, as reported by the Crop-Reporting Service. Even in this relatively favorable year, however, the quantities of corn available for feed on most survey farms were not great enough for large-scale livestock feeding operations.

Feeds purchased. Seventy-seven farmers bought hay, 54 corn, 30 oats, and 6 wheat. Twenty-four bought cottonseed meal and soybean meal, and 47 tankage. Forty-nine bought dairy feed, 112 hog feed, 135 laying mash, and 108 growing mash (Table 15).

Amounts of feed purchased per farm were relatively small. The average farmer questioned bought a little more than 3 tons of hay, approximately 56 bushels of corn, and about 12 bushels of oats. Processed feeds purchased included approximately 324 pounds of cottonseed meal and soybean meal, 387 pounds of tankage, 684 pounds of dairy feed, 1,871 pounds of hog feed, and 3,566 pounds of poultry feed.

LIVESTOCK PROGRAMS

As previously indicated, livestock programs on typical claypan farms are relatively small. Data in Table 7 indicate that on the farms surveyed the numbers of livestock were related to the size of the farm since there were not as many livestock on timber soil and prairie soil farms as on the other four groups. The small livestock programs per farm are in part attributable to the relatively low productivity of the hay and pasture land.

Acres of hay and pasture per animal unit for all the farms surveyed are shown in Table 16. The average was 4.2 acres. Although all groups of farms required considerable acreage per animal unit, bottomland-upland and bottomland farms required less than the other four. As bottomland and bottomland-upland farms produced more grain than the others, the production of less hay and pasture per animal unit might be due to the fact that more grain was fed in relation to roughage. Some groups had a higher proportion of legumes in their hay and pasture mixtures than others. Small grain aftermath and stalk fields were not included in hay or pasture.

Table 15. — Commercial Feeds Purchased by Operators of Six Groups of Sample Farms^a

Feed	Bot- tom- land farms (30)	Tim- ber soil farms (30)	Flat upland farms (33)	Prairie soil farms (27)	Bot- tom- land- upland farms (35)	Mixed upland farms (39)	All farms (198 ^b)
Feed purchased per farm (pounds)							
Cottonseed and soybean meal.....	250	200	215	44	760	403	324
Tankage.....	1,150	337	76	85	251	469	387
Dairy feed.....	198	497	349	196	1,517	1,146	684
Hog feed.....	2,047	2,847	1,373	1,093	1,820	2,000	1,871
Poultry feed.....	3,670	3,327	3,512	3,015	3,426	4,351	3,566
Number of farms purchasing different feeds							
Cottonseed and soybean meal.....	3	2	7	2	5	5	24
Tankage.....	12	7	5	4	8	10	47
Dairy feed.....	5	12	6	5	8	13	49
Hog feed.....	17	17	16	15	20	24	112
Poultry feed.....	21	19	24	21	24	30	139

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b Four farms are included here that are not included in any of the six groups, as explained in footnote b, Table 6.

Note.—The average farmer purchased 3.2 tons of hay. Bottomland farmers purchased 3.1 tons per farm, timber-soil farmers 2.3 tons, flat-upland farmers 2.1 tons, prairie-soil farmers 3.7 tons, bottomland-upland farmers 2.7 tons, and mixed-upland farmers 5.2 tons.

Table 16. — Acres of Hay and Pasture per Animal Unit on Six Groups of Sample Farms^a

Kind of farms	Number of farms	Acres per animal unit ^b
Bottomland farms.....	30	3.6
Timber soil farms.....	30	4.8
Flat upland farms.....	33	4.7
Prairie soil farms.....	27	5.7
Bottomland-upland farms.....	35	3.0
Mixed upland farms.....	39	4.3
All farms.....	198 ^c	4.2

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b Acres refer to tillable land or tillable equivalent. Three acres of nontillable pasture were counted as one acre of tillable pasture.

^c Four farms are included here that are not included in any of the six groups, as explained in footnote b, Table 6.

All Cattle

There is a fairly close relationship between cattle numbers and size of farms, as shown in Table 7, page 17. Prairie soil, timber soil, and mixed upland farms, which average fewer acres than those in the other three groups, had 10.0, 11.0, and 13.3 head of cattle, respectively, per farm. The bottomland group had approximately 13 head per farm, the flat upland group 15 head, and the bottomland-upland group 20 head. Cattle sold per farm (Table 17) ranged from about 3 head on timber soil farms to about 11 head on the bottomland-upland group.

Despite there being herds with dual-purpose aspects and many animals of mixed beef-dairy breeding, all cattle were classified as either beef or dairy in order to obtain a more detailed analysis of the cattle enterprises. Disregarding breeding, cattle that were apparently used primarily for dairy purposes were classed as dairy cattle and those that were apparently used primarily for beef production were classed as beef cattle (Tables 18 and 20, pages 31 and 34).

According to this classification, 107 farms had only dairy cattle, 45 had only beef cattle, and 38 had both beef and dairy cattle, leaving 8 with no cattle. However on 24 of the 38 farms with both beef and

Table 17. — Livestock and Livestock Products Sold per Farm From Six Groups of Sample Farms^a

Item	Bot- tom- land farms	Tim- ber soil farms	Flat upland farms	Prairie soil farms	Bot- tom- land- upland farms	Mixed upland farms	All farms
Number of farms.....	30	30	33	27	35	39	198 ^b
All cattle, number....	4.1	2.8	6.2	5.5	11.1	6.5	6.2
Hogs, number.....	15.4	8.8 ^c	10.8	7.4	25.5	9.1	13.9
Chickens, number ^e ...	54.8	88.9 ^d	62.4	69.1	80.2	89.8	100.0
Eggs, dozen.....	946.5	989.2	891.0	1,009.4	1,237.3	974.8	1,142.8
All sheep, number....	1.1	3.1	5.1	1.6	3.5	2.0	2.7
Wool fleeces, number..	.7	...	.5	.1	.1	.3	.3
Horses, number.....	.7	...	.5	.1	.1	.3	.3

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b Four farms are included here that are not included in any of the six groups, as explained in footnote b, Table 6.

^c One farm that sold 77 hogs and another that sold 103 hogs were excluded from the group because they are not representative. If they were included, the average would be 14.8.

^d One farm, on which 5,000 broilers were produced, was excluded from the average because it is not representative. If it were included, the average would be 254.5.

^e One farmer in the gently-sloping-soil group had a turkey enterprise and sold 110 turkeys that weighed 15 pounds each.

dairy cattle just one or two cows were kept to produce milk for home use. The remaining 14 farms had several head of both beef and dairy cattle.

Dairy Cattle

Size of herds. There were about four milk cows in the average herd. Bottomland, timber soil, and prairie soil farms had fewer cows per herd than average while the other three groups had more (Table 18).

Dairy cattle other than milk cows ranged from 1.5 per herd on the prairie soil farms to 3.9 per herd on the timber soil farms.

Farms with one to three cows. Most farmers milking one, two, or three cows paid little attention to breeding, and the average cow probably had a higher proportion of beef breeding than dairy breeding. On farms with three cows or less, a large proportion of the milk produced was used in the household. Any milk not used for this purpose was separated and the cream was sold at a local cream station. The skim milk was used to feed calves, hogs, or chickens.

Farms with four or more milk cows. Although several farmers with four or more cows reported that they paid little attention to breeding, or that they milked cows of beef breeding and produced milk primarily for home use, a number of others reported that they had or were working toward a herd made up of good grade dairy cows and were

Table 18. — Average Number of Dairy Cattle per Herd on 145 Sample Farms Having Dairy Cattle^a

Item	Bot- tom- land farms	Tim- ber soil farms	Flat upland farms	Prairie soil farms	Bot- tom- land- upland farms	Mixed upland farms	All farms with dairy herds
Number of farms with dairy cattle.....	21	20	25	20	27	30	145 ^b
Cattle per herd							
Cows.....	3.7	3.3	4.6	3.5	4.6	4.5	4.1
Calves.....	1.3	2.5	2.1	1.0	2.2	1.5	1.8
Other cattle.....	1.5	1.4	1.7	.5	1.4	2.1	1.5
Total.....	6.5	7.2	8.4	5.0	8.2	8.1	7.4
Cattle sold.....	2.6	1.9	4.8	2.7	3.7	4.4	3.5

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres. Both beef and dairy cattle were found on 38 farms. On 24 of these there were only one or two dairy cows that were milked for home use; these are included in the table above. On the remaining 14 farms there were both a beef and a dairy herd.

^b Two farms are included here that are not included in any of the six groups. Steep and eroded soils comprise 55 percent or more of the area of these two farms.

producing butterfat for the market. Although artificial insemination is an excellent way to improve the milk-producing capacity of dairy herds, only one of the 145 farmers interviewed was using it. Several farmers who milked beef-type cows produced butterfat for market.

A record of the butterfat sold was obtained from 45 farms that averaged slightly more than 5 cows per herd. About 122 pounds of butterfat was sold annually per cow and about 664 pounds per farm. To ascertain production per cow or per farm, the milk used on the farm would have to be taken into account. This information was not obtained from the survey.

Farms selling whole milk. Whole milk was sold from 15 farms. Two were bottomland farms, 3 flat upland soil farms, 4 bottomland-upland farms, 5 mixed upland farms, and one was a prairie soil farm. Milk was sold in Fairfield, Flora, Mt. Vernon, and Olney.

The number of cows milked ranged from three to twenty. The average was nine. An average of 3,454 pounds of milk was sold per cow and an average of 32,467 pounds per farm. Milk sold per cow ranged from 968 to 5,232 pounds and that sold per farm ranged from 5,805 to 73,460 pounds (Table 19).

Herds used to produce whole milk for sale were, for the most part, made up of grade dairy cows or cows with a high proportion of dairy breeding. Most of the cows were bred to a purebred or good grade dairy bull.

Facilities for milk production were better on these 15 farms than on most of the farms in the survey. These farmers had sanitary milk sheds with concrete floors and facilities for cooling their milk. In contrast, most farmers who produced cream or milk for home use did not have milk sheds with concrete floors and cooled their milk or cream in cellars or cisterns.

Table 19.—Data on Dairy Enterprise on 15
Sample Farms Selling Whole Milk*

Item	Average	Range	
		Low	High
Cows per farm.....	9.4	3	20
Heifers or calves per farm.....	5.8	3	18
Whole-milk sales			
Per farm, pounds.....	32,467	5,805	73,460
Per cow, pounds.....	3,454	968	5,232
Cattle sales			
Veal calves, number.....	3.7	1	14
Average weight, pounds.....	178	150	225
Other cattle, number.....	2.1	1	7

* Farm survey, Wayne county, 1948. All farms include 30 or more acres.

Breeding practices. Only a few of the farmers who milked cows indicated that they planned to have cows freshen in the fall in order to obtain a winter milk flow when prices are higher. Most cows freshened in the spring and were milked throughout the grazing season.

Feeding practices. Practically none of the farmers fed balanced rations, but some used better feeding practices than others. As most farmers fed the hay produced on their farms, the majority fed redtop or a redtop-and-lespedeza mixture. Some fed soybean and cowpea hay. A few others fed mixed alfalfa or clover hay. Quite a few farmers feed only hay during the winter. Evidently on many farms during years of unfavorable hay production and on some farms during other years, operators feed the minimum amount of hay required to maintain their cows during the winter and, except for a small amount of milk obtained for home use, milk only during the grazing season.

Other farmers supplement hay with home-grown grain when it is available and when it is not available buy grain for this purpose. Three or 4 operators fed silage during the winter, 12 fed cottonseed meal, 17 soybean meal, and 49 commercial dairy feeds.

Because many farmers feed a limited amount of hay, hay with only a small percentage of legumes, hay without supplements, or hay and grain rations that are low in protein, the average milk cow falls considerably below her productive capacity during the winter months.

Most cows graze on redtop, lespedeza, or a mixture of the two, and on most farms no other grasses and legumes are available during periods when lespedeza and redtop furnish little roughage. This, coupled with the fact that a large number of farmers do not supplement pasture with grain or other feeds, results in a summer milk flow considerably below the capacity of most cows.

Dairy cattle sold. About one cull cow, two veal calves and one head of other cattle were sold per farm (Table 18). Cull cows sold averaged about 800 pounds, veal calves about 190 pounds, and other cattle about 565 pounds. Most of those classed as "other cattle" were yearlings or long yearling heifers. A few were offspring of dairy cows that were bred to beef bulls.

Beef Cattle

Typical beef-cattle enterprises were small. Practically all beef-cattle farmers had their own breeding herds and raised the cattle they sold from the farm. Only four operators purchased feeder cattle.

Size of herds. The average herd had about 20 cattle (Table 20). About 9 were breeding cows, 5 were calves, and 6 were heifers, steers, or bulls. Herds on prairie soil and timber soil farms had fewer cattle

than average. Those on mixed upland farms had about the same number of cows as the average herd, while the other three groups had considerably more than the average.

Table 20. — Average Number of Beef Cattle per Farm on 83 Sample Farms Having Beef Cattle^a

Item	Bot- tom- land farms	Tim- ber soil farms	Flat upland farms	Prairie soil farms	Bot- tom- land- upland farms	Mixed upland farms	All farms with beef herds
Number of farms with beef cattle.....	11	14	11	14	18	14	83 ^b
Cattle per farm							
Cows.....	9.8	5.6	12.0	5.3	10.6	9.3	8.7
Calves.....	6.5	3.9	5.6	3.8	6.7	5.9	5.5
Other cattle ^c	7.9	3.8	7.0	3.1	9.7	4.6	6.1
Total.....	24.2	13.3	24.6	12.2	27.0	19.8	20.3
Cattle sold.....	6.1	3.4	7.7	6.8	16.0	8.6	8.6

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres. Both beef and dairy cattle were found on 38 farms. On 24 of these there were only one or two dairy cows that were milked for home use. On the remaining 14 there were both a beef and a dairy herd.

^b One farm is included here that is not included in any of the six groups. Steep and eroded soils comprise 55 percent or more of the areas of this farm.

^c Bulls, steers, and heifers.

Breeding. A much larger percentage of the cattle used for beef production were beef type than the cattle used for milk production were dairy type. Most cattle were grade Hereford or had a high proportion of Hereford breeding, and most cows were bred to good grade or purebred Hereford bulls. Two farmers interviewed specialized in production of Hereford and one in production of Aberdeen Angus breeding stock.

Feeding practices. For feed most farmers depended primarily on hay and pasture and used only a limited amount of grain. A number of farmers said that they feed a small amount of grain to herd cows and other cattle in order to carry them through the winter in better condition and occasionally feed some grain during dry summers when pastures do not provide sufficient nourishment.

Most of the hay fed was redtop or a mixture of redtop and lespedeza. A few farmers had cowpea, soybean, mixed alfalfa, or clover hay to feed. For the most part, cattle were pastured on redtop or a mixture of redtop and lespedeza. As most of the farmers interviewed fed only a limited amount of grain, most of the cattle offered for sale were grass-fed.

Sales. About two herd cows averaging approximately 1,000 pounds and about six other cattle averaging nearly 650 pounds were sold per farm. Fifty-six calves averaging 200 pounds were sold from the 83 farms with beef herds. A number of them undoubtedly went for veal. This indicates that some of the herds used primarily for beef production have some dual-purpose aspects. Milk from the mothers of some of these calves was probably used in the household. Fewer cattle were sold per herd from the timber soil, bottomland, and prairie soil groups than from the other four (Table 20).

About 55 percent of the cattle sold, other than cows and calves, weighed from 400 to 700 pounds. Most of these cattle were probably born in the spring or early summer, carried over on hay and a small amount of grain the following winter, pastured the following summer and sold in the late summer or fall. Some of the cattle weighing between 700 and 800 pounds may have been handled in this way. One hundred and twenty-four of the 156 cattle weighing over 800 pounds were sold from two farms; one farmer sold 92 and the other sold 32. Most of these cattle were probably two years old or older.

Hogs

Bottomland farms, bottomland-upland farms, and flat upland farms, with a larger average corn acreage than the other three groups of farms, had the larger hog enterprises (Table 7, page 17).

Farms with hogs. Of the farms surveyed, 178 had hogs and 129 had brood sows (Table 21). In most instances, operators of farms with hogs but without brood sows bought pigs for home use and fed them out. A few bought pigs, fed them out, and sold them.

The average number of brood sows was about two on farms with hogs. Timber soil, prairie soil, and mixed upland farms had fewer sows than average, while the other three groups had more.

Roughly half the timber and prairie soil farms had brood sows and roughly two-thirds of the bottomland and flat upland farms had them. Brood sows were found on 29 of the 35 bottomland-upland farms and 28 of the 39 mixed upland farms. Fifty-four farms had one sow, 35 farms two sows, 15 farms three, 8 farms four, 16 farms from five to nine, and one farm had 25 (Table 37, page 53).

Litters farrowed. On the average hog farm about 60 percent of the pigs were farrowed in the spring and about 40 percent in the summer or fall. Litters per farm ranged from 1.5 for the prairie soil group to 4.6 for the bottomland group. The mixed upland group had 2.0 litters per hog farm, the timber soil group 2.3, the bottomland-upland group 3.0, and the flat upland group 3.1. Because of better weather, approximately one more pig was saved from the average summer and fall litters than from the average spring litter.

Table 21. — Data on Hog Enterprise on 178 Sample Farms With Hogs^a

Item	Bot- tom- land farms	Tim- ber soil farms	Flat upland farms	Prairie soil farms	Bot- tom- land- upland farms	Mixed upland farms	All farms
Number of farms with hogs.	25	28	29	22	33	38	178 ^b
Farms with brood sows.	20	16	20	13	29	28	129
Hogs per farm							
Brood sows.	3.0	1.3	2.2	1.0	2.2	1.5	1.9
Other hogs.	20.1	9.4	10.7	6.5	14.1	8.0	10.9
Litters farrowed per farm.	4.6	2.3	3.1	1.5	3.0	2.0	2.7
Pigs saved per litter							
Spring litters.	6.5	7.7	6.7	8.1	6.9	6.6	6.9
Summer and fall litters.	7.3	8.2	7.2	7.1	7.8	8.1	7.7
All litters.	6.9	8.0	6.8	7.6	7.3	7.2	7.2
Hogs sold per farm							
Fat hogs, number.	17.0	12.2	6.3	6.6	24.0	7.8	12.5
Average weight, pounds.	226.1	249.8	231.2	204.2	230.8	216.8	228.7
Weaned pigs, number.	1.5	3.7	6.0	2.4	3.1	1.6	3.0
Total hogs sold.	18.5	15.9 ^c	12.3	9.0	27.1	9.4	15.5

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b Three farms are included here that are not included in any of the six groups. Steep and eroded soils comprise 55 percent or more of the area of these farms.

^c This figure is not representative because one farmer sold 77 and another sold 103 hogs. When these two are excluded the average is 9.5.

Sanitation. In general, farmers with the larger hog enterprises appeared to pay more attention to hog sanitation than those with smaller ones. This is probably because where there are large numbers of hogs they are more likely to become infected with worms or disease than where there is a small number. Also a large hog enterprise is likely to receive more attention than a small one because on many farms it would provide a larger share of the farm income.

A number of operators reported that they cleaned out the farrowing pens at farrowing time and took other special measures to control worms in their hogs. A large number of farmers pastured their hogs on redtop and lespedeza and a smaller number used some plan of rotating hog pastures. Rather typical of this small group was an operator who moved his hogs to another pasture every two years and plowed up the pasture from which the hogs were moved. Quite a few farmers kept their hogs in a drylot.

Feeding practices. Most farmers realized that it was desirable to supplement corn with protein feeds. Tankage or hog supplement was purchased on 134 of the 178 farms with hogs. A number of operators used the skim milk that was available to feed to their hogs. Most farmers fed their fattening hogs two or three times a day instead of using self-feeders or keeping feed before them at all times.

Sales. About 12 fat hogs and three weaned pigs were sold from the average farm that kept hogs. Sales per farm ranged from 9.0 hogs on the prairie soil farms to approximately 27 hogs on the bottomland-upland farms. Most of the fat hogs sold were six to eight months old and weighed from 200 to 250 pounds. Most farmers did not time farrowing so as to have their pigs ready to sell when prices were highest in the fall or spring. Weaned pigs were sold primarily to farmers who did not have brood sows and who bought a few pigs each year to fatten for home use. This provides additional income to operators who have one or two brood sows but who do not produce enough grain to feed out all the pigs that are farrowed. They usually keep enough pigs to consume the available grain and sell the rest when the pigs are weaned.

Poultry

Size of flocks. The average farmer with poultry had a laying flock of about 147 hens (Table 22). The bottomland and the bottomland-upland farms had more laying hens per flock than the other four (Table 38, page 53). Only 16 farmers had flocks with 300 hens or more. Fifty-five farmers had less than 100, and 43 farmers had from 200 to 300 laying hens.

Table 22.—Data on Poultry Production on 189 Sample Farms With Chickens*

Hens per flock.....	147	Chickens sold per farm	
Baby chicks purchased per farm		Hens, number.....	54
Straight-run.....	105	Average weight, pounds.....	4.6
Pullets.....	71	Young chickens, number.....	51
Cockerels.....	40	Average weight, pounds.....	2.7
Total.....	216		
Eggs sold per farm, dozens.....	1,187		

* Farm survey, Wayne county, 1948. All farms include 30 or more acres.

Production practices. The predominant breed of chickens in the county was white leghorns. A few farmers had heavy breeds. Practically all farmers had poultry houses that kept the flock reasonably warm in winter. A number of farmers seemed to be conscious of the profits connected with good feeding and kept feed and water before their chickens at all times. One hundred and thirty-five of the 189 farmers with chickens bought egg mash to feed with corn or other grain. Several others fed skim milk. A few mixed their own mash. The majority of farmers culled their flocks several times a year.

Flock replacement. Practically all farmers provided for flock replacement by buying baby chicks from hatcheries and raising them in a brooder house. The average poultry raiser bought about 216 baby

chicks, of which approximately 105 were straight run, 71 were pullets, and 40 were cockerels (Table 22).

Egg sales. The average poultryman sold about 1,187 dozen eggs per year (Table 22). Most farmers who sold eggs sold less than 1,500 dozen (Table 40, page 54). Fifteen farmers sold from 1,500 to 1,800 dozen, 4 farmers from 1,800 to 2,100 dozen, 13 farmers from 2,100 to 3,000 dozen, and 12 farmers from 3,000 to 6,340 dozen.

Twenty-one farmers sold some of their eggs to hatcheries, one mailed them to special customers in St. Louis, and the remainder sold them to local egg dealers. Farmers who sold eggs to hatcheries received a price considerably above the market and most of them bought poultry feed from the hatchery at a below-market price. Representatives from the hatchery culled their flocks at regular intervals and tested their birds for diseases that are normally transmitted through the egg. The farmer who sold eggs in St. Louis also received a premium price.

Live poultry sales. The average poultry producer sold about 54 cull hens that averaged 4.6 pounds and 51 young chickens that averaged 2.7 pounds (Table 22). Young chickens sold were primarily cockerels or cull pullets from baby chicks that farmers bought for flock replacement or eating.

Other poultry enterprises. On all farms except one, chickens were the only important poultry enterprise. One farmer had about 60 turkeys on hand and sold about 110 turkeys that weighed about 15 pounds each.

Sheep

Farms with sheep. Because sheep are not very well adapted to poorly drained land and perhaps for other reasons, they are a relatively minor livestock enterprise in Wayne county. Of the 198 farms studied, only 29 had flocks of sheep (Table 23).

Size of flocks. The average flock consisted of about 17 ewes and a ram. Ewes per flock ranged from 5 to 50. Fourteen flocks had fewer than 25 ewes and nine flocks had 25 or more. Except for one flock of purebred Hampshires, all ewes were grade. Most farmers bred their ewes to good grade or purebred rams.

Production practices. Most farmers fed their sheep legume or mixed hay. A number of those not having alfalfa or clover other than lespedeza saved out some of their best lespedeza to feed before and during lambing season. Most farmers fed some grain before and during this period, and a number fed minerals. One operator reported severe losses from pregnancy disease.

Several operators reported that they used phenothiazine to prevent losses from stomach worm during the summer months.

Table 23.—Production Data for 29 Flocks of Sheep on Sample Farms^a

Item	Number of farms reporting item indicated	Number and weight of animals and fleeces		
		Average	Range	
			Low	High
		(Sheep per flock ^b)		
Sheep				
Ewes.....	23	16.7	5	50
Lambs.....	12	3.3	1	30
Rams.....	20	.8	1	2
		(Sales per flock ^c)		
Sales				
Wool.....	24			
Number fleeces.....	..	18.1	5	55
Average weight, pounds.....	..	6.4	..	..
Lambs.....	23			
Number.....	..	14.2	1	55
Average weight, pounds.....	..	73.6	..	..
Ewes.....	8			
Number.....	..	4.1	3	30
Average weight, pounds.....	..	130.2	..	..
Rams.....	5			
Number.....	..	.2	1	1
Average weight, pounds.....	..	203.0	..	..
Total sheep sold per farm.....	..	18.5	..	..

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres. Two flocks of sheep were on bottomland-soil farms, 6 on gently sloping timber-soil farms, 7 on poorly drained flat upland-soil farms, 2 on gently sloping prairie-soil farms, 7 on bottomland-soil combination farms, and 5 on gently sloping timber-soil combination farms.

^b Ending inventory.

^c Five farmers sold all the sheep they owned.

Sales. About 14 lambs, 18 fleeces, and 4 cull ewes were sold per flock in 1948 (Table 23). Lambs sold averaged about 74 pounds, cull ewes about 130 pounds, and fleeces about 6.5 pounds.

POWER, EQUIPMENT, AND LABOR

The following discussion concerning tractors and horses on these farms is based largely on the data in Tables 7, 24, and 41 on pages 17, 40, and 55. That concerning custom work is based largely on Table 25, page 41.

Farms with tractors. Tractors and tractor equipment are now in common use in Wayne county. One hundred forty-two of the 198 farmers contacted owned one or more tractors, and 25 of the 56 farmers not having tractors hired some tractor work in 1948. As would be expected, groups having the largest farms and the more active operators had more farms with tractors and more tractor equipment

than the others, and farms with tractors were larger than those without. Twenty-six of the 30 bottomland farms, 30 of the 35 bottomland-upland farms, and 25 of the 33 flat upland farms had tractors and tractor equipment. In contrast, only 24 of the 39 mixed upland farms, 19 of the 30 timber-soil farms, and 16 of the 27 prairie-soil farms had this equipment. The average tractor farm comprised about 239 acres, while the average farms without tractors comprised about 117.

Most of the farms with tractors had tractor plows, disks, and cultivators, but there were only about one combine and one corn picker for every five tractors. There was only one tractor mower for every 2½ tractors. Most of the farmers without corn pickers and combines husked corn by hand and hired their small grain combined or threshed.

Horses on farms. Even though tractors were found on nearly 72 percent of the farms, most operators had two or three head of horses and some horse equipment. On farms with tractors a large part of the horse equipment was no longer in use, a small part of it was used with horses, and a small part of it had been adjusted so it could be used with a tractor. It is doubtful whether an average farmer with tractors used horses more than 15 to 30 days a year. On farms with tractors horses are used chiefly to do small chores, such as plowing and cultivating gardens, mowing hay, and gathering corn in the fall of the year when the land is so wet it is difficult to use a tractor.

Table 24. — Number of Selected Machines and Other Data Regarding Tractors and Horses on Sample Farms^a

Item	Bot- tom- land farms (30)	Tim- ber soil farms (30)	Flat upland farms (33)	Prairie soil farms (27)	Bot- tom- land- upland farms (35)	Mixed upland farms (39)	All farms (198) ^b
Selected machines, number ^c							
Tractors	38	24	31	17	39	27	178
Combines	15	1	5	1	4	10	36
Corn pickers	10	1	3	3	9	7	33
Hay balers	7	2	5	..	4	5	23
Average size of farm, acres							
With tractors	309.8	154.9	244.3	185.0	266.2	234.6	239.2
Without tractors	95.0	78.0	124.4	116.8	144.0	138.8	117.4
Farms without tractors hiring tractor work, number	3	5	6	2	2	7	25
Farms with horses, number..	28	22	27	23	34	37	174
Horses per farm reporting, number	3.5	2.0	3.4	2.4	3.1	3.2	3.0

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b Four farms are included here that are not included in any of the six groups, as explained in footnote b, Table 6.

^c For other machines on farms see Table 41 in Appendix.

Table 25. — Custom Work Done for Others and Hired by Operators of Sample Farms^a
(Machine hours)

Kind of work	Bottomland farms (30)		Timber soil farms (30)		Flat upland farms (33)		Prairie soil farms (27)		Bottomland-upland farms (35)		Mixed upland farms (39)		All farms (198) ^b	
	Done for others	Hired	Done for others	Hired	Done for others	Hired	Done for others	Hired	Done for others	Hired	Done for others	Hired	Done for others	Hired
Combining.....	156	398	..	339	104	262	114	62	115	507	562	619	1,051	2,218
Baling.....	300	36	355	151	30	251	12	6	180	59	4	62	881	592
Plowing.....	124	18	61	198	164	71	82	34	38	62	45	87	514	470
Disking.....	..	52	30	145	99	43	52	3	22	63	30	74	233	385
Threshing.....	230	9	..	70	..	68	..	2	..	73	10	137	240	359
Hauling (with team and wagon).....	..	..	..	150	..	..	40	320	..	..	..	..	40	470
Cultivating.....	..	20	19	34	60	..	160	10	30	8	15	38	284	110
Mowing.....	20	5	40	13	82	10	5	5	8	19	..	93	155	145
Raking hay (with push rake).....	..	..	..	..	25	..	3	..	160	9	..	12	188	21
Miscellaneous.....	50	40	15	27	..	102	..	..	20	154	..	112	85	435
Total.....	880	578	520	1,127	564	807	468	442	573	954	666	1,234	3,671	5,205
Machine hours per farm.....	29.3	19.3	17.3	37.6	17.1	24.5	17.3	16.4	16.4	27.3	17.0	31.6	18.5	26.3
Number of operators doing or hiring custom work.....	6	19	3	22	7	22	5	9	6	21	5	28	32	124

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.^b Four farms are included here that are not included in any of the six groups, as explained in footnote b, Table 6.^c Includes work done with drill, binder, truck, bulldozer, planter, corn picker, silage cutter, ditching machine, and scraper.

Custom work. Most of the custom work in Wayne county is done by a small part of the farmers, but many farmers hire some custom work done. On the sample farms in 1948 only 32 farmers did custom work for others, while 124 hired some custom work done. The 198 operators interviewed hired about 5,200 machine hours during the year, but did only about 3,700 hours of work for others. The fact that some nonfarmers and some farmers with less than 30 acres supplied some of the custom work explains most of this difference of 1,500 hours between machine hours hired and that done for others. Combining and baling accounted for more than half the total hours of custom work hired and done for others. For hours of custom work hired for various operations and done for others on all six groups of farms see Table 25.

Exchange work. A large number of Wayne county operators exchange machine work with their neighbors in lieu of custom work. For example, an operator with a corn picker who does not have a combine may pick his neighbor's corn, and in return the neighbor will combine his small grain. Several farmers surveyed did machine work for their neighbors in return for labor.

Labor. For data on the amount and kind of labor used on the surveyed farms, it is necessary to turn back to Table 7, page 17.

The total amount of labor varied from 11.5 months per farm on the timber soil farms and 12.5 months on the prairie soil farms to 17.9 months on the bottomland farms.

Table 26. — Number of Major Buildings and All Buildings on Sample Farms, and Their Condition as Rated by Farmers^a

Kind of building	Bot- tom- land farms	Tim- ber soil farms	Flat upland farms	Prairie soil farms	Bot- tom- land- upland farms	Mixed upland farms	All farms ^b
Buildings per farm							
Barn	1.4	1.3	1.5	1.0	1.4	1.2	1.3
Henhouse	1.1	.9	1.2	1.0	1.0	1.2	1.1
Cornercrib	1.1	.8	1.2	.9	1.3	1.1	1.0
Hog house	1.2	.8	.5	.3	.9	.7	.7
Brooder house . . . . .	.7	.9	.7	.6	.7	.8	.7
All buildings	7.0	5.9	6.2	4.8	6.4	6.1	6.1
Percent of buildings in condition indicated							
Good	46.9	53.1	46.8	69.2	66.8	53.6	55.3
Fair	42.1	35.6	41.9	19.2	27.4	31.2	33.9
Poor	11.0	11.3	11.3	11.6	5.8	15.2	10.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b Four farms are included here that are not included in any of the six groups, as explained in footnote b, Table 6.

On the average farm the operator worked about 10 months a year, used 3.5 months of family labor, and hired 1.9 months of labor. Timber soil farmers and prairie soil farmers hired about 15 days of work a year, whereas the other groups used from 1.9 to 3.5 months of this labor.

BUILDINGS

Most farmers had enough buildings to provide shelter for their livestock but not enough to house all their machinery and store all their hay. On a large number of farms in Wayne county part of the hay crop is stacked. The numbers of various kinds of buildings on the six groups of farms, and their condition as rated by the farmers surveyed are shown in Table 26.

SUMMARY AND CONCLUSIONS

The primary purpose of this study was to obtain a precise description of farming in the claypan region of southern Illinois. Data were obtained through a survey of 198 Wayne county farms, 30 acres and larger, selected by a random-sampling method. The sample is considered fully representative of farm operating units in Wayne county and of farms on claypan soils in surrounding counties. Analysis of the survey data has been related mainly to the tenure patterns found on these farms and to their soil resources. Results of the analysis should serve as useful background for those interested in and responsible for agricultural programs in the claypan area of the state.

The survey was made in 1948 at a time when rather rapid changes were occurring in farming in the area. Changes were stimulated by high incomes in previous years and by technological developments, particularly mechanization and use of fertilizers. Effects of increased mechanization were indicated most sharply in a greatly increased soybean acreage, a decrease in the acres of idle land, and an increase in size of farms. Although use of fertilizer was increasing at the time of the survey, the typical farm had by no means attained a complete and balanced fertility program.

Tenure. Land tenure is a factor of particular significance in the claypan area. General characteristics of the tenure situation are:

1. The relatively young age at which farmers acquire ownership of their land, frequently a small acreage. Eighty-three percent of all operators on the sample farms owned all or part of the land they farmed.

2. The tendency of farmers to expand their operations by renting, and occasionally by buying, additional land. Fifty-four percent of all operators were part-owners, and the average age of all part-owners was only four years more than that of operators who rented all the land they farmed.

3. The general practice of these farmers to retire on the land. There is frequently a period of 10 to 20 years when a farmer progressively reduces the scale of his operations.

In some respects this kind of tenure system is highly flexible. It makes possible a good deal of adjustment in the size of a farm to fit the age of the operator, the family labor supply, and available capital. It also provides for a large proportion of farmers the security of both land and home ownership.

Field-renting was stimulated by the war and postwar conditions. Farmers with relatively good machinery were in a position to expand their businesses to take advantage of high prices. General shortage of labor and lack of machinery on many farms made more land available to rent. Predominance of the part-owner farm is, to some extent, a phase of the general trend toward larger farms to fit modern production methods. Nevertheless part-owning and field-renting were well established in the area many years before the war, and they can be expected to continue as important tenure patterns.

The chief difficulty with the multiple-tract field-renting system is that it complicates the planning and carrying out of sound land-use and soil-treatment programs. Rental arrangements established in the past were developed in an era of low capital inputs and low returns. The most common rental agreement is one in which the landlord receives one-third of the grain crops, half the hay and "grass" seed, and no cash rent for pastureland. Such an agreement, particularly when it is on a year-to-year basis, does not encourage either the owner or the tenant to carry on a land-use and soil-improvement program that is most profitable. During the survey a number of instances were reported in which the landlord and tenant had worked out mutually satisfactory agreements in which both were sharing in the costs and benefits of a good land-improvement program. Such agreements should be given definite consideration on all rented farms in the area.

Soil resources. In classifying farms according to their soil resources, the soil types in Wayne county were combined into five groups: bottomland soils, flat upland soils, gently sloping timber soils, gently sloping prairie soils, and steep and eroded soils. Although most farms include land in more than one of these five groups, the survey farms were classified into six groups according to the *predominating* soils or combination of soils on the individual farms. The six groups of farms differed significantly in size and organization and in volume of production per farm. These differences, and the particular problems of each group of farms, as well as the problems of the farms as a whole, are outlined here.

Improving incomes on individual farms. Results of the survey show that certain improvements are generally needed on all six groups of farms. A basic need is for higher production per acre and per farm.

A balanced fertility program is needed to correct mineral deficiencies in the soil and to maintain fertility at a profitable level. At the time of the survey a good deal of the land had not been fertilized, and very little of it had received treatment adequate to maintain high-profit cropping systems and high-profit yields. Much land was in low-producing hay and pasture crops contributing little to the farms' income, either in livestock production or in higher grain production. In general, improvements in soil fertility and land use would result in greatly increased grain production with fewer acres in hay and pasture, in greatly increased livestock production, or in greater production of both grain and livestock. With relatively few exceptions, livestock enterprises on survey farms were small, often too small for efficient production methods. Small livestock numbers reflect low feed supplies and a general lack of capital to invest in breeding herds.

Desirable improvements would involve using more capital in the farming business. In the past capital inputs per farm have been low in this area. Building up the soil, increasing livestock numbers, and providing necessary equipment and buildings do require considerable capital. Results being obtained on experiment fields and demonstrated on some farms in the area indicate, however, that such capital investments are sound for the farmer who has average or above-average managerial ability.

Bottomland farms. Bottomland farms in the survey averaged 281 acres and were largest of the six groups. One-third of the farms included only rented land—a higher proportion than in any other group. Seventy percent of their total area was bottomland.

Grain production was emphasized on bottomland farms. They are the principal soybean producers in the area and the only group of survey farms with more acres of soybeans than corn. Acreages of wheat, hay, and rotation pasture are limited by risk of flooding. Cattle numbers were relatively small on bottomland farms in the survey, but the number of pigs farrowed per farm was relatively high.

Opportunities for success with different systems of farming are rather limited on bottomland farms but vary with flood hazards. A large part of the land should be in soybeans and corn. Yields can be increased considerably through balanced fertilizer treatments, catch crops, and better weed control.

Bottomland farms, in general, do not have large enough acreages of hay and pasture for large herds of dairy or beef cows. Hogs and feeder cattle are better adapted, and it would be profitable to increase these enterprises on many farms. Corn is available for feed. Most of the farms have upland areas suitable for livestock centers and adapted to forage production on a limited scale.

In this study the risks of flood damage were not specifically determined. On bottomland farms, however, the risk is relatively high,

and crop yields can be expected to vary considerably from year to year. Another problem is that with large acreages of soybeans and corn, peak labor requirements are high, and there is only a limited amount of time in which field work can be done on the bottomland. Large machinery investments are necessary. Maintenance of fertility at a high level would also require relatively large annual purchases of fertilizers. On bottomland farms in the survey, however, a larger proportion of the tillable land was untreated than in any other group of farms.

Flat upland farms. Survey farms in this group averaged 215 acres: 122 acres were poorly drained flat upland soils and 73 acres gently sloping prairie or timber soils. It is on these farms that management problems associated with claypan soils are most serious. Thirty-one percent of the tillable land was in corn, 16 percent in soybeans, and 8.5 percent in small grains. Average yields of all grain crops were below the averages for all farms in the survey. Forty-two percent of the tillable land was in hay and pasture, but much of this acreage was relatively unproductive. Although there were more cattle than on bottomland farms, livestock numbers were generally low relative to acreages of feed and forage crops.

After their fertility has been built up, flat upland farms offer rather wide opportunities in the choice of profitable systems of farming. On most of these farms erosion is not a serious problem, and with adequate soil treatment they can be successfully farmed in intensive rotations. They can be operated as grain farms with only enough livestock to utilize legumes and grasses needed in a grain system, or as livestock farms of various types, with grain as a secondary source of income.

Bottomland-upland farms. Bottomland-upland farms in the survey averaged 249 acres. About 10 percent of this area was steep and eroded; the remainder was half bottomland soils and half upland soils of various types. On 66 percent of the farms part of the land was owned and part rented. This is the typical situation where the farmer owns an upland tract and rents bottomland mainly for grain production.

The combination of bottomland and upland soils is well adapted to general systems of farming in which both grains and livestock are important sources of income. Upland areas are large enough to provide forage for good-sized livestock enterprises, and bottomlands are used to produce most of the grain for feed and for market. This arrangement was clearly shown in the survey. Bottomland-upland farmers had, in general, larger livestock businesses than any other group. They produced more corn per farm than any other group and had the highest percent of their tillable land in corn. On the other hand, they had less than the average percent of tillable land in soybeans. With larger livestock enterprises, corn was evidently considered a more

valuable crop than soybeans on these farms. A larger proportion of bottomland on the bottomland-upland farms was less subject to serious flood damage than the bottomland on the bottomland farms, and could be worked earlier in the spring. This accounts for some of the wide differences in the proportion of land in soybeans on these two groups of farms.

In a number of respects bottomland-upland farms had more productive farming programs than any of the other groups. Less of the land was untreated, the cropping systems made relatively good use of land resources, and larger and better balanced livestock programs were being followed.

Mixed upland farms. These farms averaged 198 acres and had the most varied soil resources of all groups. Each farm had a variety of soils, mostly upland types, with no one type dominant. The general quality of the soil resources was lower than on the flat upland, bottomland, and bottomland-upland farms.

Mixed upland farms varied in their organization and in other matters, as well as in their soil resources, showing no definite pattern. Apparently, however, they were operated by a relatively large number of young farmers. They included a slightly lower proportion of owned land than any other group. Their cropping systems were rather intensive, considering the quality of their land: 56 percent of their tillable land was in grain crops and 39 percent in hay and pasture. Livestock numbers per farm were average or below average, but five of the 15 survey farms selling whole milk were in this group. Some of the farms were well equipped with machinery and some very poorly equipped.

Timber and prairie soil farms. These two groups of farms, both on gently sloping soils, were similar in many respects, their problems differing mainly in degree. Their soil resources were more limited than in any other group. The timber soil farms averaged 127 acres, and the prairie soil farms 157 acres. These were the only groups with more owned land than rented land. Only three of the 57 farmers in both groups rented all the land they farmed.

Because of their advanced age, or for other reasons, the operators of many of these farms gave less than full time to their farms. Total annual labor per farm averaged 11.5 and 12.5 months respectively. Some of these farmers were partially retired and had rented out a part of their land best suited to grain production. A high proportion of the tillable land they operated was in hay and pasture; but since no analysis was made of land rented out or of crops received as rent from such land, it was not possible to determine the importance of such land in the operation of the two groups of farms.

If typical farms in these two groups were to be successfully operated as full-time businesses, they would offer a rather limited choice

of farming systems. Acreages are small, and a high proportion of the sloping land must be kept in hay and pasture. Livestock systems are needed to fully utilize both the crops grown and the labor of the farmer and his family. With a few notable exceptions, however, livestock numbers were quite small on survey farms in these groups. Among the exceptions were a timber soil farmer who produced 5,000 broilers, and two other farmers in the same group who sold 77 hogs and 103 hogs respectively. These are not large-scale livestock enterprises, but they do represent desirable adjustments to meet the situations these farms present.

The choice between using dairy cattle or beef cattle to utilize forage on these small farms should depend largely on the labor available or on the amount of labor a farmer chooses to put into the business. An efficient dairy herd would provide profitable employment for much more labor than a beef-cow herd that could be carried on the same amount of hay and pasture. Feeder-cattle programs would be profitable, but it is apparent that most operators of these farms cannot assume, or do not choose to assume, the risk of annual purchases of feeders.

Outlook for future. Because of the nature of claypan soils, agriculture in this area has been characterized by low capital inputs, low land values, small farms, low volume of production, low income per farm, and a good deal of part-time farming. To a large extent this background explains the tenure pattern, the differences in the ages of farmers and in the acres and quality of land resources on different farms. It also explains the cause of the inadequate soil-fertility programs and small livestock numbers on most farms at the time of the survey.

Rapid changes in technology were, however, taking place on many farms in the area in 1948, resulting in greater production per farm and per acre. This trend has continued. That these changes have been stimulated by favorable economic conditions emphasizes the importance of capital inputs in improving farm incomes.

Production and income possibilities in the claypan area far exceed what was thought possible only a few years ago. To develop these possibilities requires much greater input of capital per farm than has been typical in the past. In fact, for the individual farmer, the problem of increasing income is three-sided. The farmer has to know how to acquire the needed income; in what part of the business to invest it for quick and safe returns; and how to manage the business in order to be sure of getting the potential returns.

APPENDIX TABLES

Table 27.— Number and Percentage of Farm Operators in Various Age Groups, by Tenure^a

Age group (years)	Owned farms		Rented farms		Part-owned farms		All farms	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
20-29.....	2	3.5	4	11.8	13	12.3	19	9.6
30-39.....	8	13.8	20	58.8	35	33.0	63	31.8
40-49.....	9	15.5	3	8.8	28	26.5	40	20.2
50-59.....	21	36.2	5	14.7	17	16.0	43	21.7
60-69.....	14	24.1	2	5.9	12	11.3	28	14.2
70-89.....	4	6.7	..	....	1	.9	5	2.5
All ages.....	58	100.0	34	100.0	106	100.0	198	100.0

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

Table 28.— Distribution of Sample Farms by Number of Tracts and Tenure of Operators^a

Number of tracts	Owned farms		Rented farms		Part-owned farms		All farms	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1.....	33	56.9	9	26.5	..	....	42	21.2
2.....	16	27.6	8	23.6	17	16.0	41	20.7
3.....	7	12.1	3	8.8	24	22.7	34	17.2
4.....	2	3.4	9	26.5	28	26.4	39	19.7
5.....	..	....	3	8.8	19	17.9	22	11.1
6-11.....	..	....	2	5.8	18	17.0	20	10.1
Total farms.....	58	100.0	34	100.0	106	100.0	198	100.0

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

Table 29.— Distribution of Headquarters Tracts and Other Tracts by Size and by Tenure of Operators^a

Size of tracts (acres)	Owned farms		Rented farms		Part-owned farms		All farms	
	Number	Percent	Number	Percent	Number ^b	Percent	Number	Percent
(Headquarters tracts)								
1-19.....	1	1.7	2	5.9	7	6.6	10	5.0
20-59.....	18	31.0	3	8.8	36	34.0	57	28.8
60-99.....	12	20.7	6	17.7	33	31.1	51	25.8
100-139.....	10	17.3	8	23.5	19	17.9	37	18.7
140-179.....	9	15.5	1	2.9	6	5.7	16	8.1
180-537.....	8	13.8	14	41.2	5	4.7	27	13.6
Total.....	58	100.0	34	100.0	106	100.0	198	100.0
(Other tracts)								
1-19.....	6	16.6	21	30.4	89	27.2	116	26.8
20-59.....	18	50.0	30	43.5	152	46.5	200	46.3
60-99.....	7	19.4	13	18.8	49	15.0	69	16.0
100-139.....	2	5.6	4	5.8	19	5.8	25	5.8
140-179.....	2	5.6	..	....	13	4.0	15	3.5
180-537.....	1	2.8	1	1.5	5	1.5	7	1.6
Total.....	36	100.0	69	100.0	327	100.0	432	100.0
Total tracts.....	94	....	103	....	433	....	630	....

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres. Fifty-eight farms were owned, 34 were rented and 106 were part-owned.

^b Four of the headquarters tracts were rented. The remaining 102 were owned. Fifty-eight of the tracts other than headquarters were owned. The remaining 269 were rented.

Table 30. — Distribution of Six Groups of Sample Farms by Size^a

Size of farm (acres)	Bottomland farms		Timber soil farms		Flat upland farms		Prairie soil farms		Bottomland-upland farms		Mixed upland farms		All farms ^b	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
30-99.....	3	10.0	12	40.0	5	15.2	9	33.4	2	5.7	4	10.2	36	18.2
100-179.....	7	23.3	12	40.0	8	24.2	8	29.6	14	40.0	15	38.5	66	33.3
180-259.....	5	16.7	5	16.7	9	27.3	5	18.5	7	20.0	7	28.2	43	21.7
260-339.....	7	23.3	1	3.3	5	15.2	4	14.8	3	8.6	6	15.4	26	13.1
340-419.....	2	6.7	4	12.1	4	12.1	1	3.7	4	11.4	1	2.6	12	6.1
420-839.....	6	20.0	..	..	2	6.0	..	..	5	14.3	2	5.1	15	7.6
Total farms.....	30	100.0	30	100.0	33	100.0	27	100.0	35	100.0	39	100.0	198	100.0
Acres per farm.....	281.2		126.7		215.2		157.2		248.7		197.8		204.8	

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.^b Four farms are included in the total that are not included in any of the six groups of farms, as explained in footnote b, Table 6.Table 31. — Distribution of Six Groups of Sample Farms by Size of Headquarters Tracts and Other Tracts^a

Size of tracts (acres)	Bottomland farms		Timber soil farms		Flat upland farms		Prairie soil farms		Bottomland-upland farms		Mixed upland farms		All farms ^b	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1-19.....	4	13.3	1	3.3	2	6.0	..	..	2	5.7	1	2.6	10	5.0
20-59.....	5	16.7	12	40.0	8	24.2	12	44.5	8	22.9	11	28.2	57	28.8
60-99.....	7	23.3	10	33.3	5	15.2	6	22.5	11	31.4	10	25.6	51	25.8
100-139.....	1	3.3	2	6.7	10	30.3	5	18.5	8	22.8	10	25.6	37	18.7
140-179.....	5	16.7	2	6.7	2	6.1	1	3.7	3	8.6	3	7.7	16	8.1
180-537.....	8	26.7	3	10.0	6	18.2	3	11.1	3	8.6	4	10.3	27	13.6
Total.....	30	100.0	30	100.0	33	100.0	27	100.0	35	100.0	39	100.0	198	100.0
					(Headquarters tracts)									
					(Other tracts)									
1-19.....	7	11.7	28	50.0	18	24.3	15	28.9	18	20.2	24	26.7	116	26.8
20-59.....	27	45.0	23	41.0	36	48.6	29	55.8	38	42.7	42	46.7	200	46.3
60-99.....	14	23.3	4	7.2	13	17.6	6	11.5	18	20.3	14	15.6	69	16.0
100-139.....	5	8.3	1	1.8	6	8.1	..	..	6	6.7	7	7.7	25	5.8
140-179.....	4	6.7	..	..	1	1.4	2	3.8	6	6.7	3	3.3	15	3.5
180-537.....	3	5.0	..	..	..	..	..	..	3	3.4	..	..	7	1.6
Total.....	60	100.0	56	100.0	74	100.0	52	100.0	89	100.0	90	100.0	432	100.0
Total tracts.....	90		86		107		79		124		129		630	

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.^b Four farms are included here that are not included in any of the six groups of farms, as explained in footnote b, Table 6.

Table 32. — Distribution of Six Groups of Sample Farms by Number of Tracts per Farm^a

Tracts per farm	Bottomland farms		Timber soil farms		Flat upland farms		Prairie soil farms		Bottomland-upland farms		Mixed upland farms		All farms ^b	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1.....	6	20.0	13	43.4	8	24.2	7	25.9	4	11.4	4	10.3	42	21.2
2.....	6	20.0	4	13.3	7	21.2	6	22.3	5	14.3	13	33.3	41	20.7
3.....	8	26.6	3	10.0	8	24.2	4	14.8	5	14.3	5	12.8	34	17.2
4.....	6	20.0	3	10.0	1	3.1	4	14.8	13	37.1	9	23.0	39	19.7
5.....	2	6.7	3	10.0	4	12.1	4	14.8	5	14.3	4	10.3	22	11.1
6.....	2	6.7	1	3.3	3	9.1	2	7.4	3	8.6	4	10.3	9	4.5
8-11.....	..	..	2	6.7	..	..	..	..	..	..	..	..	7	3.5
Total farms.....	30	..	30	..	33	..	27	..	35	..	39	..	198	..

^a Farm survey, Wayne county, 1948. All farms include 30 acres or more.

^b Four farms are included here that are not included in any of the six groups of farms, as explained in footnote b, Table 6.

Table 33. — Distribution of Six Groups of Sample Farms by Age of Operators^a

Age of operator (years)	Bottomland farms		Timber soil farms		Flat upland farms		Prairie soil farms		Bottomland-upland farms		Mixed upland farms		All farms ^b	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
20-29.....	3	10.0	1	3.4	2	6.1	3	11.1	4	11.4	6	15.4	19	9.6
30-39.....	9	30.0	9	30.0	11	33.3	9	33.4	11	31.5	13	33.4	63	31.8
40-49.....	6	20.0	7	23.3	9	27.3	4	14.8	7	20.0	7	17.9	40	20.2
50-59.....	6	20.0	6	20.0	8	24.2	6	22.2	9	25.7	7	17.9	43	21.7
60-69.....	5	16.7	7	23.3	3	9.1	3	11.1	4	11.4	4	10.2	28	14.2
70-79.....	1	3.3	..	..	..	..	2	7.4	..	..	1	2.6	4	2.0
80-89.....	..	..	..	..	..	..	..	..	..	..	1	2.6	1	.5
Total farms.....	30	100.0	30	100.0	33	100.0	27	100.0	35	100.0	39	100.0	198	100.0

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b Four farms are included here that are not included in any of the six groups of farms, as explained in footnote b, Table 6.

Table 34. — Distribution of Six Groups of Sample Farms by Bushels of Grain Produced per Farm^a

Bushels produced	Bottom-land farms	Timber soil farms	Flat upland farms	Prairie soil farms	Bottom-land-upland farms	Mixed upland farms	All farms ^b
(Number of farms)							
Corn^c							
1-999	5	12	9	11	5	13	56
1,000-1,999	7	8	7	6	11	10	51
2,000-2,999	7	5	7	6	6	8	39
3,000-3,999	4	..	3	2	6	3	16
4,000-8,270	5	..	6	..	6	4	23
Total farms	28	25	32	25	34	38	185
Soybeans^d							
1-499	6	7	7	6	13	11	52
500-999	2	1	7	5	4	7	27
1,000-1,499	5	2	2	1	3	4	17
1,500-1,999	5	..	1	1	..	..	7
2,000-4,030	5	..	1	..	4	..	10
Total farms	23	10	18	13	24	22	113
Wheat^e							
0-299	5	9	8	4	12	9	48
300-599	6	4	5	1	6	5	27
600-3,090	4	2	..	..	6	3	15
Total farms	15	15	13	5	24	17	90

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b Four farms are included here that are not included in any of the six groups of farms, as explained in footnote b, Table 6.

^c Does not include corn used for silage.

^d Includes only soybeans combined and threshed.

^e Includes only wheat combined and threshed.

Table 35. — Distribution of Six Groups of Sample Farms by Bushels of Corn Sold or Given as Share Rent^a

Bushels of corn per farm	Bottom-land farms	Timber soil farms	Flat upland farms	Prairie soil farms	Bottom-land-upland farms	Mixed upland farms	All farms ^b
(Number of farms)							
1-499	5	10	6	6	9	8	45
500-999	3	5	3	4	3	8	26
1,000-1,499	4	1	4	4	3	7	23
1,500-1,999	4	1	4	2	5	3	19
2,000-8,050	7	1	7	2	8	5	30
Total farms	23	18	24	18	28	31	142

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b Four farms are included here that are not included in any of the six groups of farms, as explained in footnote b, Table 6.

Table 36.—Distribution of Six Groups of Sample Farms
by Number of Milk Cows per Farm^a

Milk cows per farm	Bottom-land farms	Timber soil farms	Flat upland farms	Prairie soil farms	Bottom-land-upland farms	Mixed upland farms	All farms with dairy herds ^b
	(Number of farms)						
1.....	5	4	3	3	3	3	21
2.....	3	7	7	7	10	8	42
3.....	4	2	3	3	1	2	15
4.....	..	3	2	..	3	4	12
5.....	4	1	1	2	3	4	16
6.....	1	1	2	3	3	2	12
7.....	4	..	1	1	1	1	8
8-20.....	..	2	5	1	3	5	17
Total farms.....	21	20	24 ^c	20	27	29 ^c	143

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b Two farms are included here that are not included in any of the six groups. Steep and eroded soils comprise 55 percent or more of the area of these farms.

^c One farm in this group had dairy cattle but no milk cows.

Table 37.—Distribution of Six Groups of Sample Farms
by Number of Brood Sows per Farm^a

Brood sows per farm	Bottom-land farms	Timber soil farms	Flat upland farms	Prairie soil farms	Bottom-land-upland farms	Mixed upland farms	All farms with brood sows ^b
	(Number of farms)						
1.....	7	6	8	7	12	14	54
2.....	3	5	8	5	7	6	35
3.....	1	3	1	..	5	5	15
4.....	3	1	..	1	1	1	8
5-25 ^d	6	1	3	..	4	2	17
Total farms.....	20	16	20	13	29	28	129 ^c

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b Four farms are included here that are not included in the six groups. Steep and eroded soil comprises 55 percent or more of the area of these four farms.

^c While 178 of the 198 farms had hogs, only 129 had brood sows.

^d All farms in this classification except one had from five to nine sows. One flat upland farm had 25.

Table 38.—Distribution of Six Groups of Sample Farms
Having Chickens, by Size of Flock^a

Number of laying hens ^b	Bottom-land farms	Timber soil farms	Flat upland farms	Prairie soil farms	Bottom-land-upland farms	Mixed upland farms	All farms with chickens ^c
	(Number of farms)						
1-99.....	6	10	8	9	7	12	55
100-199.....	9	11	13	11	14	13	72
200-299.....	10	4	9	5	8	7	43
300-600.....	2	4	1	..	5	4	16
Total farms.....	27	30 ^d	32 ^d	26 ^d	34	36	189
Number of hens per flock.....	161.7	139.1	136.7	119.3	173.3	154.6	147.3

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b On hand October 1, 1948.

^c Four farms are included here that are not included in any of the six groups of farms, as explained in footnote b, Table 6.

^d One farm in each of these groups had flocks of chickens during 1948, but sold them before October 1.

Table 39. — Production Data for Six Groups of Sample Farms Having Chickens^a

Item	Bottom-land farms	Timber soil farms	Flat upland farms	Prairie soil farms	Bottom-land-upland farms	Mixed upland farms	All farms with chickens ^b
Number of farms	27	30	32	26	34	36	189
	(Number per farm)						
Baby chicks purchased							
Straight run	137.0	102.5	72.7	59.6	83.8	166.1	104.7
Pullets	50.2	70.8	89.8	59.6	113.2	36.0	71.3
Cockerels	10.4	190.0	6.3	11.5	17.6	15.3	40.4
Total	197.6	263.3 ^d	168.8	130.7	214.6	217.4	216.4
Eggs sold, dozens	1,051.6	989.2	918.9	1,048.0	1,273.6	1,056.1	1,186.6
	(Number and weight per farm)						
Chickens sold							
Hens, number	47.6	57.4	47.2	67.3	61.4	46.8	54.1
Average weight, pounds	4.4	4.6	4.2	4.4	4.5	5.0	4.6
Young chickens, number . .	13.3	197.1 ^c	17.1	4.4	21.2	50.5	50.6
Average weight, pounds	3.2	2.6	3.1	3.7	2.3	2.7	2.7

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b Four farms are included here that are not included in any of the six groups of farms, as explained in footnote b, Table 6.

^c This average is not representative of the farms in the group because one farmer sold 5,000 broilers. When this farm is not included the average is 31.5.

^d This figure is not representative because one farmer purchased 5,200 cockerels. When this farm is excluded the average is 196.5.

Table 40. — Distribution of Six Groups of Sample Farms Having Chickens, by Dozens of Eggs Sold^a

Dozens of eggs sold per farm	Bottom-land farms	Timber soil farms	Flat upland farms	Prairie soil farms	Bottom-land-upland farms	Mixed upland farms	All farms with chickens ^b
	(Number of farms)						
1-299	2	7	5	4	3	8	29
300-599	4	3	3	8	9	6	33
600-899	5	4	6	4	4	6	30
900-1,199	7	4	4	..	5	3	25
1,200-1,499	2	..	4	4	3	2	15
1,500-1,799	3	3	1	2	3	3	15
1,800-2,099	1	1	..	..	..	2	4
2,100-2,999 . . . . .	..	2	2	2	3	4	13
3,000-6,340 ^c	2	2	2	1	4	1	12
Total farms	26 ^c	26 ^c	27 ^c	25 ^c	34	35 ^c	176 ^c

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres.

^b Four farms are included here that are not included in any of the six groups of farms. Steep and eroded soil comprises 55 percent or more of the area of these four farms.

^c Some farms in these groups had chickens but did not sell eggs.

Table 41. — Machinery on Six Groups of Sample Farms^a

Kind of machinery	Bottom-land farms	Timber soil farms	Flat upland soil farms	Gently sloping prairie soil farms	Bottom-land-upland farms	Mixed upland farms	All farms
Number of farms	30	30	33	27	35	39	198 ^b
	(Number of machines)						
Wagon	48	33	39	37	50	33	245
Tractor	38	24	31	17	39	27	178
Tractor plow	32	22	32	15	36	26	165
Tractor disk	33	17	30	15	34	27	158
Spike- or spring-tooth harrow	28	17	31	18	25	36	157
Walking plow	23	16	24	18	27	30	143
Tractor cultivator	27	17	26	14	28	24	139
One-row cultivator	13	17	14	15	21	37	120
Corn planter	18	14	16	14	24	29	119
Dump rake	6	14	21	16	14	32	116
Mowing machine	15	17	15	14	18	28	109
Cream separator	11	16	13	7	21	14	84
Disk harrow	11	7	11	10	15	19	76
Tractor mower	16	8	12	5	17	11	69
Sulky plow	6	6	7	6	9	16	52
Grain drill	15	6	3	3	9	9	46
Combine	15	1	5	1	4	10	36
Sweep rake	4	7	7	3	5	9	35
Corn picker	10	1	3	3	9	7	33
Grain binder	2	6	2	5	9	9	33
Roller	6	2	8	4	4	7	32
Seeder	5	2	7	1	8	7	30
Hay baler	7	2	5	..	4	5	23
Two-row cultivator	4	4	3	7	2	2	22
Corn sheller	6	1	2	..	4	7	20
Side-delivery rake	6	..	4	2	3	4	19
Rotary hoe	3	2	3	1	5	3	17
Fan mill	5	1	4	..	1	3	15

^a Farm survey, Wayne county, 1948. All farms include 30 or more acres. In addition to the machines listed above, the 198 farmers reported 10 gang plows, 10 threshing machines, 9 corn binders, 6 silage cutters, 6 corn elevators, 5 stacking outfits, 5 manure spreaders, 4 milking machines, 4 hammer mills, 3 hay loaders, 3 trailers, 3 gas engines, 1 electric motor, 1 corn crusher, 1 orchard sprayer, 1 milk cooler, 1 pea and bean huller, and 1 phosphate spreader.

^b Four farms are included here that are not included in any of the six groups of farms, as explained in footnote b, Table 6.

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