

SOIL SURVEY OF SANGAMON COUNTY, ILLINOIS.

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LOCATION AND BOUNDARIES OF THE AREA.

Sangamon County lies a little southwest of the geographical center of the State of Illinois. It is situated between the meridians of $89^{\circ} 13'$ and $90^{\circ} 1'$ west longitude and the parallels of $39^{\circ} 32'$ and $39^{\circ} 59'$ north latitude. Menard and Logan counties lie to the north, Macon and Christian to the east, Christian, Montgomery, and Macoupin to the south, and Morgan, Cass, and Menard to the west. Sangamon County is irregular in outline. Its greatest length from east to west is 41 miles, and its greatest breadth from north to south is 31 miles. The line of greatest length through the county is from northeast to southwest. It embraces an area of about 866 square miles, or 553,980 acres.

Springfield, the capital of the State, lies near the center of the county, almost on a line drawn through Chicago and St. Louis. It is distant about 185 miles from the former and 100 from the latter place.

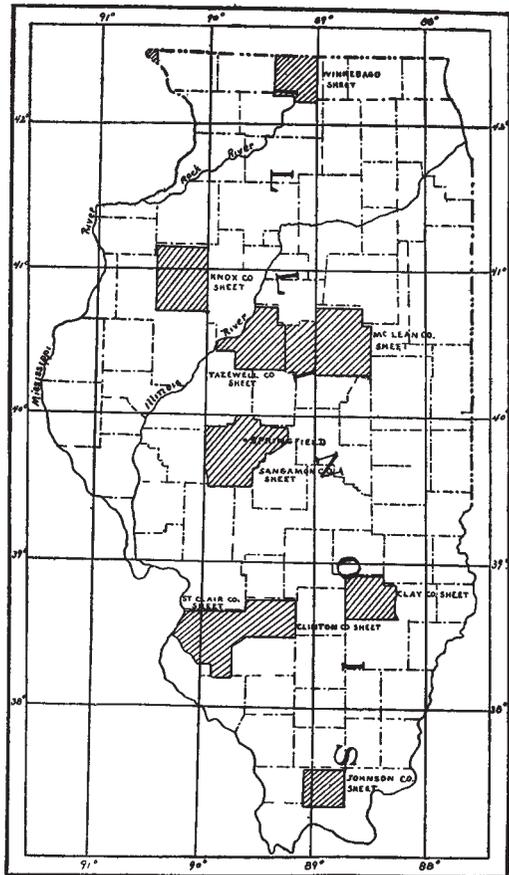


FIG. 34.—Sketch map showing location of the Sangamon County area, Illinois.

HISTORY OF SETTLEMENT AND AGRICULTURAL DEVELOPMENT.

Sangamon County was created by an act of the legislature in 1821. As originally constituted, it contained a much larger area than it does at the present time and embraced all of what is now Tazewell, Mason, Menard, and Cass counties, and parts of Christian, McLean, Woodford, Macon, Marshall, and Putnam counties. The present boundaries were established in 1839. Springfield became the county seat in 1821, and in 1837 it was also chosen as the capital of the State.

This county was not one of the first of the State to receive the great tide of immigration which rolled into the great central valley. The earliest settlers followed the courses of the larger streams, and hence the land in the "Sangamon country" was taken up later than that nearer the rivers. The first settlement within the present borders of the county was made in 1817, when Robert Pulliam erected his cabin on the east side of Sugar Creek, in sec. 21, T. 14 N., R. 5 W. This was one year before Illinois was admitted into the Union. A few survivors of the Pottawatomie and Kickapoo tribes of Indians were still to be seen, but most of the Indians had already been driven farther west. The South furnished the largest proportion of the early settlers, Kentucky, North Carolina, and Virginia supplying more than any of the other States. After railroads were built the number of settlers from the Northern States increased, and settlements were made in every part of the county.

The first immigrants settled and cleared small tracts for cultivation along the borders of the timber which skirted the bluffs of the streams. The prairie lands, which are now the most valuable of any in the county, were considered almost worthless, and those who first attempted to cultivate them were laughed at. The prairies abounded in ponds, marshes, and swamps, and were very unhealthful. They were covered with a thick growth of prairie grass higher than a man's head, the roots of which formed a thick, tough mass that the crude plows of the early settlers could not turn. These plows consisted of a bar of iron about 2 feet long, with a broad share of iron welded to it, and a moldboard made of wood. The land was prepared for small crops of corn and wheat by plowing with this crude implement, after which it was smoothed with a wooden-toothed harrow or with a brush drag. Wheat was sown broadcast by hand, 1½ bushels to the acre being used. It was cut with a sickle or cradle, thrashed with a flail or tramped out with stock, and winnowed with a sheet or with the wind. Until the "deep snow" of 1830-31 cotton was grown with some success. The climate is not, however, adapted to that great staple, and since the above date there has been little attempt to grow it. Grass grew luxuriantly and furnished excellent pasturage.

Those who tried the cultivation of the prairies were rewarded with larger harvests than had been secured upon the timbered soil, and with

the introduction of a steel plow that could turn the prairie sod the attention of the farmers was given more and more to the cultivation of the prairie lands.

There have been no periods of marked or sudden changes in the agricultural development of Sangamon County, but instead a constant progress and development. The prairies have been brought under cultivation, the ponds and swamps have been drained, better methods of cultivation and improved farm implements have been introduced, and Sangamon County stands to-day among the foremost counties of the State.

CLIMATE.

The Weather Bureau records at Springfield extend over a period of twenty-three years, beginning with 1879. The following table, compiled from records of this station, gives the normal monthly and annual temperature and precipitation for this place. As there is little more than 200 feet difference in the elevation of the highest and lowest points in the county, the data at Springfield represent quite accurately the conditions for the entire area. Data are also given for the station at Decatur, in an adjoining county to the east.

Normal monthly and annual temperature and precipitation.

Month.	Springfield.		Decatur.		Month.	Springfield.		Decatur.	
	Temper- ature.	Precipi- tation.	Temper- ature.	Precipi- tation.		Temper- ature.	Precipi- tation.	Temper- ature.	Precipi- tation.
	°F.	Inches.	°F.	Inches.		°F.	Inches.	°F.	Inches.
January.....	25.5	2.06	26.4	2.33	August.....	73.5	2.35	75.2	2.41
February....	30.2	3.39	26.3	2.08	September..	66.4	3.19	68.5	2.99
March.....	39.2	2.70	39.4	3.10	October....	55.0	2.70	56.2	1.84
April.....	58.4	3.71	58.4	2.64	November...	41.0	2.97	40.3	2.62
May.....	62.3	4.98	63.4	3.46	December..	32.8	2.75	30.7	2.08
June.....	72.1	4.45	73.1	3.68	Year....	52.2	38.01	52.4	32.16
July.....	75.9	2.76	76.3	2.93					

If properly distributed the average annual rainfall is sufficient to produce a maximum crop. June to September are the months of greatest danger. Either an excess or a deficiency in these months results in a decrease in the yields. The crops more often suffer from a deficiency than from an excess of moisture, but a total loss of crops has never happened from either cause. June is the month of greatest precipitation, while July and August show a great variation from year to year. Heavy rains from April to June often keep the ground cold and wet and retard agricultural operations. Wet autumns sometimes hinder the gathering of the crops.

During the last eight years the date of the latest killing frost in spring was May 14, and the average date April 19. The first killing frost in the fall occurred September 26, and the average date is October 14.

PHYSIOGRAPHY AND GEOLOGY.

The surface features of Sangamon County are similar to those existing over a large part of central Illinois, and consist of a broad, gently rolling plain through which the streams have carved valleys of varying width. The principal stream in the county is Sangamon River, which forms the southern boundary of the eastern part of the county, flowing in a southwestern direction, and then enters and crosses the northeastern part of the county in a northwestern and western direction. The width of the valley which it has carved out varies from a few hundred yards to as much as a mile or more, the average width being about one-half mile. The principal tributaries of the Sangamon on the south are Richland, Spring, Sugar, and Buckhart creeks, and the South Fork of the Sangamon River; and on the north, Cantral, Fancy, Wolf, and Clear creeks. These usually have narrow valleys, the widest occurring along the South Fork of the Sangamon River and along Sugar Creek. Where the Sangamon River first touches the county it has an elevation of 550 feet above sea level, and in its course of 36 miles through the county it falls 38 feet, or an average of a little more than 1 foot to the mile.

The general elevation of the country above the Sangamon River is 50 to 100 feet. The highest elevation is in the southwestern part of the county, where a preglacial ridge attains a height of more than 700 feet above sea level. Some of the hills, forming a part of the old moraine which enters the county north of Buffalo Hart and extends in a south and southeastern direction beyond Mechanicsburg, rise to an elevation of about 700 feet above the sea, giving to this section a rather hilly topography.

The general surface of the country was formerly much more level than at the present time. The character of the topography depends very largely upon the distance from the streams, the more hilly and broken character nearer the streams being due to the greater amount of erosion which has taken place there.

The oldest and only consolidated rocks which are exposed belong to the Upper Coal Measures, which overlie all the main coal seams of the State. They consist principally of sandstones and shales, with some limestones. The beds of rocks exposed along the Sangamon River and its tributaries represent a vertical section of from 165 to 220 feet, but these have practically no influence upon the character of the soil, because they have been covered by material of much later geological time.

The unconsolidated material of the Quaternary era rests directly upon the rocks of the Upper Coal Measures. These deposits are here composed of three divisions, namely, the glacial drift, the loess, and

the alluvium. The following section, published by Worthen^a in his report on Sangamon County, was furnished him by a well digger who had sunk many wells in the western part of this county:

	Feet.
1. Soil	1 to 2
2. Yellow clay.....	3
3. Whitish jointed clay, with shells.....	5 to 8
4. Black muck, with fragments of wood	3 to 8
5. Bluish-colored bowlder clay	8 to 10
6. Gray hardpan (very hard).....	2
7. Soft blue clay, without bowlders.....	20 to 40

The glacial drift consists of an admixture of sand, silt, and clay in which are bedded pebbles or gravel and an occasional bowlder. It probably averages from 20 to 40 feet in thickness; but it varies a great deal. This drift material is referred to the time of the Illinois glaciation.

The silty surface material of Sangamon County is all classified as loess by Leverett, and is believed to have been deposited about the time of the Iowan glaciation.^b The character of the material varies both vertically and horizontally. Near the Sangamon River three different layers are often seen. The lower one is typical loess and contains shells and concretions. This is overlain by about 2 feet of fine yellow sand, which is in turn overlain by a yellow clayey silt very closely resembling loess, but showing no shells or concretions. The sand is not always present along the river and is never seen very far from it, the loesslike layer resting directly upon the true loess. It may be that the upper layer was deposited at the time of the Wisconsin glaciation.

SOILS.

The soils of Sangamon County have been classified into five different types, all of which, except the Kaskaskia loam, are found upon the upland. Leaving out of consideration the Miami fine sand, which is of very limited extent, all the other soil types resemble each other in having a large percentage of silt, and although the differences are such that they are easily distinguished when typically developed, the change from one type to another is often so gradual that it is difficult to draw the boundary line between them. The extent of the different types is shown in the following table:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Marshall silt loam	332,224	60.0	Kaskaskia loam	40,192	7.2
Miami silt loam	92,416	16.7	Miami fine sand	1,024	.2
Miami black clay loam.....	88,128	15.9	Total.....	553,984

^aGeology of Illinois, Vol. V, 1873, p. 307.

^bMonograph 38, U. S. Geological Survey.

MARSHALL SILT LOAM.

The extensive and important Marshall silt loam consists of a surface soil of brown, silty loam, slightly granular and coherent, but pulverizing and crumbling quite readily. It varies in depth from 15 to 24 inches, but the subsoil is usually encountered at a depth of 18 inches. It is very uniform in texture. The more level areas are, however, slightly heavier in texture and contain more organic matter than those where the surface is more rolling. When wet the color is almost black, especially in the more level areas, but as the soil becomes drier it changes to dark brown. The color is due largely to the presence of organic matter, which exists in this soil in considerable quantities, although the proportion is not so great as in the Miami black clay loam, nor so small as in the Miami silt loam. The heavier, more sticky, granular character and the darker color of the Miami black clay loam, and the looser, more floury, lighter character, lighter color, and less depth of the Miami silt loam enable one to readily distinguish either of these types from the Marshall silt loam.

The subsoil is a mottled yellow silty clay loam or clayey silt in which the silt is the most prominent constituent. It is somewhat plastic, but this property often decreases in lower depths, the texture becoming more friable. The subsoil is frequently mottled by iron concretions, or by dark streaks which divide it into more or less irregular cubes. These streaks are due to the presence of iron or organic matter accumulated along lines caused by the cracking of the subsoil or by the penetration of roots.

A number of small white spots, usually less than 20 rods in diameter, were noticed in this type. The soil here is whitish to a depth of 18 inches or more and contains many iron concretions. The subsoil is hard and impervious. These spots occur as slight depressions and are locally known as "scalds" or "buffalo wallows." Before they were drained water stood in them for the greater part of the year. They are thought to represent old buffalo wallows, the impervious character of the subsoil being due to puddling caused by the tramping of the animals.

In the survey of Tazewell County, made in 1902, considerable areas of what is now called the Marshall silt loam was included with the Tazewell silt loam. At that time certain variations were noted in the soil mapped as the Tazewell silt loam, which, it was thought, were largely due to methods of cultivation and to physiographic position. Since then a wider experience in this and other States has shown that these variations represent two types belonging to distinct series. The differentiation is based upon the difference in organic content as well as other physical peculiarities and differences of crop adaptation. The Tazewell silt loam of Tazewell County is in part a dark-colored

soil, with high organic content, which is now recognized as Marshall silt loam, and in part a light-colored silt soil showing precisely the same grades in the mechanical analysis, but having different physical properties with the small amount of organic matter present. This phase is now known as the Miami silt loam.

The following table of mechanical analyses shows the texture of samples of this soil type:

Mechanical analyses of Marshall silt loam.

No.	Locality.	Description.	Organic matter.								
				Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.	
8498	3½ miles N. of River-ton.	Brown silty loam, 0 to 18 inches.	P. ct. 3.73	P. ct. 0.20	P. ct. 0.70	P. ct. 0.80	P. ct. 1.76	P. ct. 7.36	P. ct. 73.88	P. ct. 15.28	
8496	6 miles N. of New Berlin.	Brown silty loam, 0 to 18 inches.	3.62	.50	.90	.50	.98	5.20	72.42	18.60	
8494	2 miles SE. of Buf-falo.	Brown silty loam, 0 to 18 inches.	2.91	.20	.90	.50	.90	4.50	73.84	18.68	
8499	Subsoil of 8498.....	Mottled yellow clayey silt, 18 to 36 inches.	.69	.50	1.08	.56	1.70	7.16	73.96	15.10	
8497	Subsoil of 8496.....	Mottled yellow clayey silt, 18 to 36 inches.	.97	.24	.90	.50	.50	4.54	64.46	28.60	
8495	Subsoil of 8494.....	Mottled yellow clayey silt, 20 to 36 inches.	1.21	.30	.90	.30	.50	3.80	64.70	29.40	

The Marshall silt loam is a very extensive and important soil type, covering 60 per cent of the total area of the county. It extends in broad areas, often continuous for miles. There are very few sections in the county which do not contain at least small areas of this soil. It is not usually found near the bluffs, but in a few instances where the bluffs slope back rather gradually it extends down to the bottom land and occurs as a second bottom.

The surface varies from level to slightly hilly, but in general it may be characterized as gently rolling. A series of broken ridges—the remnant of an old moraine which enters the county north of Buffalo Hart and extends in a southeasterly direction beyond Mechanicsburg—give to this part of the area a more hilly topography. The surface is usually rolling enough to prevent water from standing on it, but underdrainage is generally necessary to secure good crops. It is not necessary to have the drains very close together. A great deal of tile has been laid, but many areas would be benefited by an increase in the amount used.

After the loess had been deposited it was acted upon by the agencies of weathering, and large quantities of humus were added to the soil by the decay of the luxuriant growth of prairie vegetation. The amount of moisture in the soil determines largely the rapidity with which the organic matter is oxidized. If there had been sufficient drainage to have prevented the formation of swamps and marshes, but not enough fall to have permitted very active erosion, it seems probable that the entire area of the county would have been covered by one soil type—the Marshall silt loam—but such was not the case, and we have, therefore, three principal upland types instead of one.

Corn is by far the most important crop grown upon this type of soil, and an average yield of 40 bushels per acre is obtained. Many farmers, however, secure as much as 80 or 90 bushels in good seasons. Oats are next in importance to corn, and the average yield is about the same. Grass and clover are also grown quite extensively. They are often sown together and are used both for pasture and for hay. From 1 to 2 tons per acre is about the average yield. Wheat is not grown to any great extent, chiefly on account of the chinch bugs.

This soil is admirably adapted to corn, oats, and hay. It is very productive, easily cultivated, and with proper care and management will continue to give excellent returns.

MIAMI BLACK CLAY LOAM.

The soil of the Miami black clay loam is composed of a black, sticky, granular clay loam containing a large percentage of silt. Its usual depth is 18 inches, but occasionally areas are found where it is as much as 2 feet in depth. It is very cohesive and when moist pulls up in a large mass around the soil auger. This sticky nature has given rise to the local term "gumbo." The property of granulation is possessed by this soil to a remarkable degree. As much as 3 or 4 inches of the surface often breaks up into a loose covering of small, irregular cubes. The soil is difficult to till, but although it may clod if plowed when too wet or too dry, the hard lumps fall to pieces when moistened by rains. It cracks badly in dry weather, and these cracks are sometimes large enough to admit one's hand and often extend to a depth of 2 feet or more. As the name would indicate, the color is a deep black, especially when moist. This is due to the very large percentage of organic matter present. The dark color, sticky, granular texture, and heavier character of this type enable one readily to distinguish it from the other soils of the area.

The subsoil is a somewhat plastic mottled yellow clayey silt in which the silt is very prominent. It is heavier and more plastic than the subsoil of the Marshall silt loam. The clay content, as well as the plasticity, decreases with the depth, and at 3 feet the material is practically the same as the subsoil of the Marshall silt loam. It shows the same

dark streaks that were noted in that type, but in addition to these there are present concretions of calcium carbonate. These are of local occurrence and are sometimes found in the soil, being most commonly seen in low and poorly drained areas. The calcium carbonate was leached out of the soil or brought here in solution from higher lying areas, and as very little of the water drained out through the subsoil in these level areas it was redeposited.

The texture of this type of soil is given in the following table of analyses:

Mechanical analyses of Miami black clay loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
8488	2 miles N. of Lanesville.	Black clay loam, 0 to 18 inches.	4.17	0.00	0.82	0.74	5.12	7.42	66.90	18.92
8490	$\frac{1}{4}$ mile S. of New Berlin.	Black clay loam, 0 to 18 inches.	3.88	.10	.80	.70	3.10	7.90	67.30	20.16
8491	Subsoil of 8490.....	Clayey silt, 18 to 36 inches.	.34	.30	.90	.70	1.60	7.36	72.36	16.94
8489	Subsoil of 8488.....	Yellow clayey silt, 20 to 36 inches.	.44	.20	.70	.80	1.76	7.24	65.30	24.00

The following samples contained more than one-half per cent of calcium carbonate (CaCO_3): No. 8489, 7.51 per cent; No. 8491, 0.87 per cent.

The Miami black clay loam is not found in as large areas as the Marshall silt loam, occupying only 16 per cent of the area of the county. It is never found near streams where erosion has been active, but is situated upon the level areas between them, or where the smaller streams have their rise. The most extensive area is found in the northeastern part of the county, but tracts of considerable extent also occur in New Berlin, Cartwright, and Chatham townships, while areas of less extent are scattered over the entire county.

The surface is level, being almost a plain. The elevation in the same area seldom varies more than 10 feet. Slight rolls sometimes occur, but the surface is generally flat. The level character of the topography gives this type very poor natural drainage, and under-drainage is necessary before crops can be grown with much success. A few farms are not artificially drained; others have fine tile systems which thoroughly drain the land. The majority of the farms, however, could be improved by better drainage.

The Miami black clay loam owes its origin to the imperfect drainage of the areas where it is found. The surface was so level that the rainfall did not run off, but remained in ponds, swamps, and marshes.

The large amount of moisture prevented the rapid oxidation of the organic matter, some of the finer particles from the surrounding areas were washed in, the acids formed by the decay of the organic matter attacked the silt particles, causing them to break up, and these causes all acting together have made this soil more sticky and granular in character than the other upland soil types.

The Miami black clay loam is the typical black prairie soil of the State, which has become famous for its production of corn. This grain forms the chief crop grown, and many of the farmers grow little else upon it. It will average about 50 bushels of corn per acre. In good seasons the average is probably 65 bushels per acre, and many farmers obtain from 80 to 100 bushels. Oats are produced in considerable quantities, and, although they lodge badly, good yields are obtained, the average per acre being probably about 40 bushels. Grass and clover do well, and a yield of from 1 to 2 tons per acre is secured. The clover heaves rather badly, especially in low places where there is a tendency for water to stand. Thorough drainage will do much to prevent this. It is doubtful if there is any soil in the world better adapted to corn than the Miami black clay loam. It is also well adapted to the other crops grown upon it, and there seems to be no necessity for the introduction of new products, at least at present.

MIAMI SILT LOAM.

The surface soil of the Miami silt loam consists of a light, loose, incoherent, very silty loam containing a small percentage of very fine sand, and having an average depth of 10 or 12 inches. There is, however, no sharp line of demarcation between the soil and subsoil, but rather an almost imperceptible change from about 10 inches down to 15 inches. On some of the steeper slopes the soil has been entirely removed by erosion. A comparatively small percentage of organic matter is present in this type and the color is therefore light, varying from a light brown to almost white. The clods are open and porous and resemble pumice stone. In a few small areas the soil contains a considerable proportion of fine sand.

The subsoil is a yellow or mottled yellow clayey silt containing dark streaks and spots, due principally to the presence of iron, but these are not as prominent a feature as in the other two types just described. When wet it shows some plasticity, though in general it is somewhat friable and when exposed in road cuts granulates and breaks up into an incoherent mass of irregular cubes.

The results of analyses of samples of this type are given below:

Mechanical analyses of Miami silt loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
8506	6½ miles S. of Sherman.	Gray silty loam, 0 to 12 inches.	0.94	0.30	1.20	0.80	1.16	5.96	74.50	15.66
8502	1 mile E. of Sherman.	Gray silty loam, 0 to 12 inches.	1.78	.30	.90	.90	1.50	6.50	71.52	18.50
8504	4 miles N., ¼ W. of Springfield.	Gray silty loam, 0 to 12 inches.	1.45	Tr.	.76	1.16	3.46	4.86	64.34	25.42
8505	Subsoil of 8504.....	Yellow clayey silt loam, 12 to 36 inches.	.42	Tr.	.30	.48	.88	5.02	75.50	17.76
8503	Subsoil of 8502.....	Yellow clayey silt loam, 12 to 36 inches.	.53	.10	.44	.40	.80	5.20	74.30	18.84
8507	Subsoil of 8506.....	Yellow clayey silt loam, 12 to 36 inches.	.53	.30	1.88	.58	.84	5.42	71.42	20.04

The Miami silt loam occupies about 17 per cent of the total area of the county. It occurs along the Sangamon River and its principal tributaries as strips varying from a few rods to more than a mile in width. The largest extent of this soil lies along the river to the north of Springfield. Its location, however, can best be seen by reference to the soil map which accompanies this report. It occupies the greater part of the area which is now or was originally covered with timber. Its extent depends very largely upon the amount of erosion which has taken place.

The surface is generally broken and hilly, but some comparatively level areas are found on the tops of the bluffs or between the streams. Being situated near the streams, a large amount of erosion has taken place, resulting in the formation of ravines and giving a broken topography. The character of the surface usually gives good drainage, and it is seldom necessary to resort to the use of tile.

The material of which this soil is composed is the weathered product of the loess layer which covers almost the entire upland. On the lower slopes, near the streams, the drift outcrops and enters to some extent into the composition of the soil. To the increased erosion and better drainage are to be attributed the differences which distinguish the Miami silt loam from the Marshall silt loam. The rain runs off readily and the organic matter oxidizes quickly, or is carried away by the water along with some of the finer mineral particles, so that the former contains less organic matter than the latter soil.

The Miami silt loam is locally spoken of as "timber soil," and a

large percentage of it is still forested. These forested areas, as well as a large proportion of those which have been cleared, are used for pasture. Bluegrass grows luxuriantly, and clover also does well. The clover is somewhat "patchy," probably due to acidity of the soil, but this condition can be corrected by the application of a few hundred pounds of lime per acre. Corn forms an important crop, and an average of 30 bushels per acre is obtained where erosion has not been too pronounced. Oats also yield well and give little trouble by lodging. Apples, pears, plums, peaches, and cherries, as well as strawberries, raspberries, blackberries, and other small fruits, are grown with much success, and a larger area is being devoted to these crops each year. This soil is well adapted to grass, wheat, and fruit.

KASKASKIA LOAM.

The texture of the Kaskaskia loam varies to some extent in different parts of the area, being heaviest in the lower places. The soil is a heavy, silty brown loam, with a small percentage of sand. It is somewhat granular and coherent. This character of material extends to an average depth of 14 inches, and in some instances there is practically no change to a depth of 3 feet or more. The greater depth is especially noticeable along the smaller streams, where the soil is also lighter in texture than in the larger areas along the river. The typical subsoil is usually heavier in texture, lighter in color, and contains less organic matter than the soil. It is a heavy, silty loam or silty clay, which is often plastic, especially in the lower areas, where water stands for some length of time. The color varies from brown to drab or yellow.

The following table of mechanical analyses shows the texture of this soil type:

Mechanical analyses of Kaskaskia loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
				P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.
8486	5½ miles N., ¼ W., of Springfield.	Heavy brown silty loam, 0 to 14 inches.	2.83	0.00	0.60	0.60	2.30	5.64	65.50	25.20
8484	2¼ miles E., 1¼ N., of Rochester.	Heavy brown silty loam, 0 to 14 inches.	2.34	.40	1.40	1.30	2.46	7.22	58.30	28.46
8482	2¼ miles N., 2¼ W., of Rochester.	Brown silty loam, 0 to 16 inches.	3.09	.00	.90	.60	1.70	3.98	63.00	29.50
8483	Subsoil of 8482.....	Heavy silty loam, 16 to 36 inches.	.76	.50	1.30	.90	1.80	4.20	68.30	22.76
8485	Subsoil of 8484.....	Silty clay, 14 to 36 inches.	1.30	.30	1.32	1.30	3.20	8.38	60.90	24.60
8487	Subsoil of 8486.....	Drab silty clay, 14 to 36 inches.	1.78	Tr.	.60	.50	2.50	7.62	58.76	29.94

The most extensive areas of Kaskaskia loam lie along the Sangamon River. It is also found along the principal tributaries of this stream, the greatest development occurring along the South Fork of Sangamon River and Sugar Creek. With the exception of the depressions representing old stream channels, which quite frequently occur, the surface is generally level. The lowest places in the bottom are often at the foot of the bluff. The bottom lands are situated about 10 feet above the river, and unless leveed are subject to overflow. After the overflows it takes several days for the water to drain off, and the farmers are often delayed in planting their corn until it is liable to be injured by early fall frosts. A few areas are protected from overflows by levees.

The Kaskaskia loam is an alluvial soil composed of materials brought down from the uplands and deposited along the streams. A considerable proportion of this type is still in timber and is used for pasture. Corn is the chief crop grown, and when it escapes destruction by floods yields of 40 to 60 bushels are not uncommon. Oats and hay give fair returns. The soil is well adapted to corn, oats, and hay, and makes good pasture land.

MIAMI FINE SAND.

To a depth of 9 inches the Miami fine sand consists of a fine, loamy brown sand. This is underlain by a fine yellow sand to a depth of 36 inches or more. Some coarser particles are also present, but the great bulk of the subsoil is a fine sand.

The areas occupied by this soil are few and very small. They are only found scattered along the bluffs, as small ridges, often too limited in extent to be shown upon the soil map.

The Miami fine sand has a sand-dune topography, consisting of low ridges or rounded knolls with hollows or depressions between. The rolling character of the surface and the open, porous nature of the soil give excellent drainage.

The sand composing this soil type has been brought down by the river and blown up on the bluffs by the winds. All the common crops of the area are grown upon this type. The areas are too small to obtain accurate estimates of the yields. Corn, clover, and grass do not produce as well as upon the other soils of the area. Some watermelons and truck are grown, but only to a very limited extent. It is well adapted to all kinds of small truck, watermelons, and sweet potatoes, and should be devoted to these crops. The area is too limited in extent ever to be of much importance in the agriculture of the county.

AGRICULTURAL METHODS.

The farmers of Sangamon County are among the most progressive in the country. There are here, as everywhere, some men who cling

to old practices long since discarded by the more progressive farmers, but fortunately they are few in number.

No systematic rotation of crops is practiced upon a large proportion of the farms. Corn is grown for a number of years in succession and is followed by oats for one or two years, and the ground is then planted to corn again. Sometimes the oats are followed by grass or clover, either for hay or pasture, the field remaining in these crops for a period of years. The best farmers plant corn two or three years, follow this with oats for one year, and then sow grass or clover, which is allowed to grow for from one to three years. More systematic rotation of crops is to be strongly recommended, for, however productive a soil may be, the best and most profitable results can not be secured by using it to grow the same crop year after year.

One thing which attracts the attention of even a casual observer is the small number of farmers who provide shelter for their implements. The majority let them stand out in the weather from the time they quit using them until they are needed again, which is a very costly and wasteful practice.

AGRICULTURAL CONDITIONS.

Sangamon is a county of fertile, well-kept, well-cultivated farms, and of prosperous, progressive farmers. It is one of the richest agricultural counties in the State. The total assessed value of the land for 1902 was \$6,786,653, and land in this State is assessed at only one-fifth its value. There is very little of it which could be bought for less than \$60 to \$70 per acre and the greater proportion of it would bring from \$75 to \$110 per acre. According to estimates given by a large number of farmers, it is believed that the total actual value of the land in the county is about \$45,000,000. The price per acre varies according to location and improvements. Thorough drainage adds considerably to the price. Lands cultivated by the owners generally have the best improvements. Most of the farmers have substantial dwellings and good barns and outhouses, while many of them have handsome residences, some of which cost from \$15,000 to \$25,000, and barns costing from \$4,000 to \$5,000.

Nearly all the farmers have good stock, and a number of them feed cattle for market. This should be more generally practiced and the manure used on the land. The Angus and the Hereford seem to be the favorite breeds. According to the Twelfth Census, the total value of domestic animals in the county in 1899 was \$3,539,010.

More than 50 per cent of the land of Sangamon County is owned by men who do not work it, but rent it to tenants. The owners themselves work 38.8 per cent, while 47.2 per cent is cultivated by tenants. The remaining 14 per cent is worked by "part owners," "owners and

tenants," and "managers." There are two general classes of tenants—those who rent for cash and those who rent on shares. The cash rental varies from \$3 to \$7 per acre, depending upon the quality of the land. The average rental is probably about \$4.50 per acre. Of the total land of the county 19.2 per cent is so rented. The share tenants constitute 28 per cent of the farming class. In this system the tenant gives a certain part of the crop for the use of the land. In the case of corn the usual agreement is for the tenant to give one-half the crop, delivered at the elevator. When oats or wheat are grown the landlord receives one-third. Pasture lands almost always rent for cash, the usual price being \$3 or \$4 per acre. Many of the tenants have lived upon and cultivated the same farms for a number of years. This class is usually made up of good, practical farmers, who keep the farms in good shape; but one can usually tell from the general appearance whether the land is worked by the owner or by a tenant.

The farms of Sangamon County vary greatly in size, ranging from 2 or 3 acres to more than 3,000 acres. There are five farms in the county which have more than 1,000 acres each. These large tracts, while belonging to one man, really constitute several farms, cultivated by different tenants. There are many farms which have between 100 and 175 acres. The average size is about 130 acres. Nearly 7 per cent of those counted in this average have less than 10 acres.

All over the county there is complaint of the difficulty of securing farm laborers. The general opinion is that this is due to the higher wages paid in the cities. As soon as a young man brought up on a farm begins to work for himself, he is attracted to the cities by the better wages and shorter hours which he can secure there. Very few, therefore, of the farm laborers have been reared in Sangamon County. Most of them have come from the southern part of the State or from the States toward the south.

The wages paid for farm labor vary from \$15 to \$30 per month, with board and lodging in addition. The labor obtained is efficient, and the only trouble is in securing enough of it. In 1899 the farmers of Sangamon County paid out for labor the sum of \$459,750, or 89 cents for each acre of land under cultivation.

Corn, oats, and hay are the principal crops grown, and potatoes, wheat, and fruit are crops of considerable importance. Of the three first mentioned corn is by far the most extensively grown. Indeed, it may be taken as the chief product. Sangamon County ranks as one of the leading corn-producing counties in the country. In 1899, according to the Twelfth Census, it produced 8,667,400 bushels. Taking the average price of corn for that year at 31 cents, this represents a value of \$2,686,894. It stood as the seventh county in the State in the number of bushels produced. Most of this crop is shipped, and elevators have been erected at nearly all the railroad stations.

Oats stand next to corn in importance. They do well on both the Miami black clay loam and the Marshall silt loam. There is, however, a greater tendency to lodge upon the former. Nearly 2,000,000 bushels of oats are produced annually.

The hay crop is also large, and the average yield is from 1 to 1½ tons per acre. Both clover and grass are grown and are often sown together. Clover does well on all the soils, although there is sometimes difficulty in securing a good stand, especially if the weather is very dry for some weeks after it is sown. Bluegrass grows luxuriantly, especially on the Miami silt loam, and makes excellent pasture,

Wheat is not grown as extensively now as it was formerly. Some say this decrease is due to smaller yields, but the majority attribute it to the ravages of the chinch bug.

From 1,000 to 2,000 acres are planted in potatoes, and 100,000 or more bushels are produced each year. These are grown principally upon the Miami silt loam and the Marshall silt loam.

In general, Sangamon is not a fruit county. Fruit does not seem to do very well upon any of the soils except the Miami silt loam and the Marshall fine sand, and the latter occurs in very limited areas. Considerable interest is taken in the growing of fruit upon the Miami silt loam, and a number of fine orchards were noticed. Apples, pears, peaches, plums, and cherries are all grown, but apples are the most important. Probably 150,000 bushels are produced in the county. Greater attention is being paid to the growing of strawberries, raspberries, blackberries, and other small fruits. These are produced almost exclusively upon the Marshall silt loam, and profitable yields are secured. All kinds of truck crops would do well upon the Marshall fine sand. The market for such crops is very good, but the areas of this soil are small and it does not offer opportunity for any considerable development of the trucking industry.

Heretofore there has never been any systematic attempt to classify and map the soils of Sangamon County in order to determine what crops are best adapted to the different types, but the farmers in general recognize the adaptability of certain soils to certain crops. The Miami black clay loam and the Marshall silt loam have long been known as excellent corn soils, while the Miami silt loam is recognized as best adapted to grass, clover, and fruits. The adaptability of the Miami fine sand to the production of watermelons, sweet potatoes, early vegetables, and like crops has not been fully appreciated. A more systematic rotation of crops upon the Miami black clay loam and the Marshall silt loam, the growing of more fruit and hay, and the raising of more stock in areas of Miami silt loam, and the growing of truck crops upon the Miami fine sand are some of the improvements which could be made in the agriculture of the county.

There are few counties which have better railroad facilities than Sangamon. Railroads radiate from Springfield in twelve different directions, thus furnishing the farmers with quick and easy communication with all parts of the country. The shortest and most direct lines between Chicago and St. Louis pass through Springfield. Stations every few miles along all the different roads entering Springfield, as well as upon two other roads which run through other parts of the county, give to the farmers of every section excellent facilities for marketing their grain and other products.

In addition to these railroads the county is crossed in every direction by dirt roads. These roads are in good condition during the greater part of the year, but in the winter and early spring they are very muddy, especially where they pass through areas of Miami black clay loam. The earlier use of the scraper in the spring and the hauling upon the wet places of slack from the coal mines would improve their condition.

The railroads place Sangamon County within easy reach of some of the greatest markets of the country. Chicago is less than 200 miles to the northeast, while St. Louis is not quite one-half that distance toward the southwest. Many other smaller towns are within easy reach. Springfield, with a population of 35,000, furnishes a home market for all the fruits and vegetables which are grown, and the demand is much greater than the supply. Small towns with from 200 to 1,500 inhabitants are dotted over the county, and these also furnish local markets for much of the produce.

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