

SOIL SURVEY OF McLEAN COUNTY, ILLINOIS.

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ASSISTED BY

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LOCATION AND BOUNDARIES OF THE AREA.

McLean County is situated a little north of the geographical center of the State of Illinois, on a direct line between Chicago and St. Louis, and a little nearer the former than the latter. Woodford and Livingston counties lie to the north; Livingston, Ford, and Champaign counties touch it on the east; Piatt, Dewitt, and Logan counties border it on the south, and Logan, Tazewell, and Woodford counties form its western boundary. It lies between west longitude $88^{\circ} 28'$ and $89^{\circ} 17'$, and north latitude $40^{\circ} 17'$ and $40^{\circ} 45'$. This is about the same latitude as that of New York, N. Y., Pittsburg, Pa., and Salt Lake City, Utah. The third principal meridian runs between the two western tiers of town-

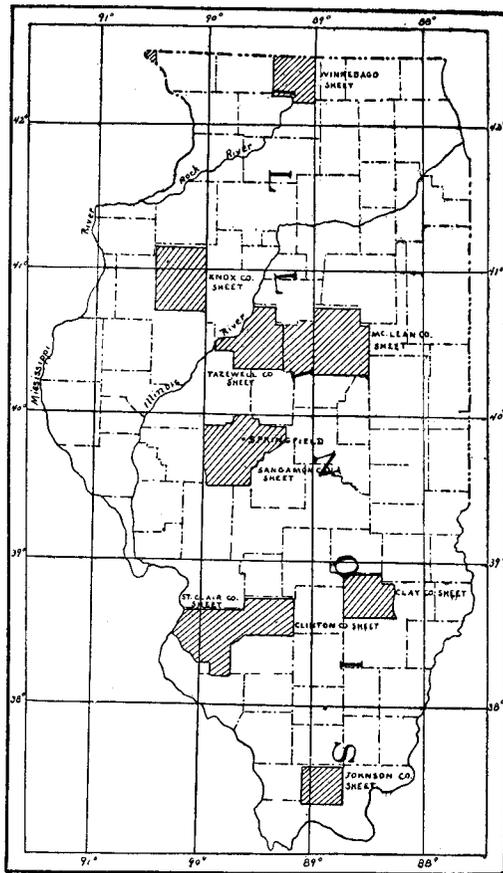


FIG. 38.—Sketch map showing location of the McLean County area, Illinois.

In size McLean, with an area of about 1,158 square miles, or 741,568 acres, ranks as the first county in the State. It is not regular in shape, the northeast and northwest corners having been cut off. Its greatest

length from east to west is 42 miles, and from north to south 32 miles. The population of the county, according to the Twelfth Census, is 67,843.

The base map upon which the work was projected was taken from a county map, but many corrections were found necessary. Three townships—Money Creek, Lexington, and Lawndale—were entirely redrawn, which necessitated the readjustment of nearly all the other townships so as to fit the irregular shape of these.

HISTORY OF SETTLEMENT AND AGRICULTURAL DEVELOPMENT.

McLean County was organized in 1830, at which time it formed a part of Tazewell County. In 1821 it was embraced in Sangamon and Fayette counties. As originally constituted it included all of its present area and also a part of what is now Livingston, Dewitt, and Woodford counties, but upon the successive erection of these counties it was reduced to its present shape and dimensions. It is still, however, the largest county in the State.

When the early pioneers arrived they found the country in full control of the Kickapoo, Potawatomi, and other less important tribes of Indians, although they had previously disposed of their title to the country to the United States Government. Their intercourse with the early settlers was friendly, and there is no account of any white man having been killed by them within the limits of the county, unless perchance during the war of 1812. The Indians had their headquarters near Old Town timber and Pleasant Hill, near the center of the county, where they remained until the Black Hawk war. The Indians raised some corn and tobacco, but the area under cultivation is hard to estimate, as the crop was grown in little patches here and there. They also made sugar from the maple trees found in the groves.

In the spring of 1822 a few settlers came from Sangamon County to Blooming Grove, and settled near its eastern end. This was the first settlement in McLean County. In the same year a settlement was begun at Randolph Grove. In 1823 White Oak, in 1824 Funks Grove and Mount Hope, and in 1825 Cheney's Grove were founded. From these points settlements spread out over the entire county. A colony of Germans came from Tazewell County about 1860 and settled in Anchor Township, and there is at present a considerable German population in the county. The first settlers in McLean County, however, came principally from Kentucky, Ohio, Indiana, North Carolina, and New Jersey.

The country when first seen by the early pioneers consisted of gently rolling prairies, with here and there, chiefly along the streams, a grove of timber. In these groves were found white oak, red oak, maple, hickory, black walnut, ash, elm, butternut, buckeye, sassafras,

and a variety of smaller growths. Much of the prairie land was wet and marshy, especially where the surface is only slightly rolling or nearly level, and here ponds were of frequent occurrence also. The early settlers sought the groves for fuel, water, shade, and shelter from the bleak, cold winds of winter. The timber land was also at first considered more desirable than the prairies, the tough prairie sod being difficult to turn with the primitive implements then in use. In the extreme southeastern portion of the county the natural sod seemed to be more easily broken, and a team of two horses was often used, while in the other parts of the county 4 or even 6 oxen were required. The usual cost of plowing was \$4 an acre. The early settlers drained their land at first by the use of mole drains, but this proved only a temporary relief and was followed by a system of open drainage. Later tile drainage became very popular and has proved a great success.

The first fencing was generally done with Osage-orange hedges, few farmers going to the expense of putting up board fences. At the present time wire fences are taking the place of hedges as soon as these die or are removed.

For the first few years the early settlers grew chiefly corn and potatoes. They then sowed wheat, and found it so profitable that its cultivation was continued for a number of years. The yield was quite large, even reaching 40 bushels per acre, and many of the settlers were enabled to pay for their land with the proceeds of a single crop. The chinch bug made its appearance during the sixties, and since that time little wheat has been grown. Some farmers say that after the soil had been cultivated for some years the wheat heaved worse than formerly, and that this had as much influence on its abandonment as the chinch bug. With the decline in wheat production, corn, oats, and hay became the principal crops, and as the soil is well adapted to these they will probably continue to be the staple products of the county.

CLIMATE.

The appended table, compiled from records of the Weather Bureau at three stations, gives the normal temperature and precipitation for the county. Bloomington is situated a little west of the center of the county, Rantoul lies in Champaign County, about 16 miles southeast of McLean County, and Peoria about an equal distance northwest, in Peoria County.

Normal monthly and annual temperature and precipitation.

Month.	Bloomington.		Peoria.		Rantoul.	
	Temperature.	Precipitation.	Temperature.	Precipitation.	Temperature.	Precipitation.
	° F.	Inches.	° F.	Inches.	° F.	Inches.
January.....	25.0	2.05	28.4	1.82	24.9	1.71
February.....	24.9	2.25	24.5	1.85	22.8	1.85
March.....	38.1	3.15	38.5	3.30	37.9	3.03
April.....	52.0	3.03	52.3	1.96	51.4	2.95
May.....	63.3	4.35	64.5	4.23	62.6	4.47
June.....	72.5	4.19	73.8	4.18	72.4	4.96
July.....	76.0	4.01	78.1	3.55	76.6	3.74
August.....	73.4	2.46	76.0	3.60	74.1	2.99
September.....	67.6	3.72	66.9	4.53	66.5	3.79
October.....	56.4	1.58	57.0	2.64	54.8	1.87
November.....	40.0	2.78	42.4	2.03	39.7	2.87
December.....	28.9	2.25	29.0	1.60	29.4	2.11
Year.....	51.6	35.77	52.7	35.29	51.0	36.34

The average rainfall, using the records of the three stations, is 35.8 inches. This is not very uniformly distributed throughout the year. During the months of May, June, and July 35 per cent of the total precipitation falls, while the three winter months show only 16.3 per cent, or less than one-half as much. The amount of rainfall also varies considerably from year to year. At Bloomington, in 1901, the precipitation was 26.63 inches, and in 1902 it was 50.93 inches. These represent the extremes since records have been kept at this point. A month with a rainfall of less than 2 inches is considered a dry month. In eleven years, at Bloomington, there have been 4 Aprils, 2 Mays, 2 Junes, 4 Julys, 7 Augusts, and 3 Septembers with less than that amount.^a

The climate of McLean County is one of considerable extremes, varying from 15° or 20° F. below zero in cold winters to 100° F. above zero in hot, dry summers. The extreme range in temperature is not far from 125° F. There are often sudden changes in temperature, brought about by the passing of "lows" and "highs."

The average dates of the last killing frost in spring are: Bloomington, April 28; Peoria, April 19; Rantoul, May 2; and of the first in fall, October 9, October 23, and October 3, for the respective stations, in the order given.

PHYSIOGRAPHY AND GEOLOGY.

The topography of McLean County is very similar to that of a large proportion of this section of the country. The general gently rolling or undulating character of the surface is interrupted by narrow bot-

^a Bull. No. 86, Ill. Exp. Sta.

tom lands along the principal streams, and by the morainal ridges of the Bloomington morainic system.

The Mackinaw River is the largest stream in the county. It enters the county near the center of the eastern boundary and runs across, leaving near the northwest corner. In its course it receives the waters of many tributary streams, the largest of which is Money Creek. The Mackinaw and its tributaries, in the upper reaches, generally have shallow channels, seldom more than 25 or 30 feet in depth. In many places the smaller streams are mere drainage ditches. The channel of the main stream deepens, until, where it leaves the area, the bluffs rise from 60 to 75 feet above the level of the river. The southwestern part of the county is drained by several branches of Sugar Creek, the largest one of which rises northeast of Bloomington and flows toward the southwest. Kickapoo and Salt creeks drain the southern, and the Sangamon River the southeastern parts of the county. Several small tributaries of Vermilion River rise in the northern part of the county and drain toward the north. The channels of all the streams are usually not very deep, and there is often a gradual slope from the bottoms until the level of the uplands is reached. Sometimes, however, rather abrupt bluffs rise from 40 to 60 feet above water level.

The surface of McLean County is also broken by the presence of morainal ridges. The southern border of the most important of these ridges enters from Tazewell County about the center of Danvers Township and runs southeast, passing about 2 miles south of Bloomington and 3 miles north of Leroy. Near the latter point it turns slightly toward the northeast and leaves the county east of Saybrook. Upon its southern slope this moraine often has almost the abruptness of a river bluff and forms a prominent feature of the landscape. Its crest rises as much as 100 feet above the country to the south. A few miles north of this moraine is another ridge which almost parallels the one just described, although the two are more closely associated in the eastern part of the county. This ridge is not so prominent as the former. Another small ridge enters the county east of Cropsey and leads westward across the northern portion, forming the divide between the Mackinaw and Vermilion rivers.

The character of the surface in different parts of the area can be told in a general way by referring to the soil map. The surface of the Marshall silt loam is gently rolling to rolling, that of the Miami black clay loam is level or gently undulating, and that of the Miami silt loam and McLean silt loam is usually broken and hilly. Upon the moraines the surface is more billowy, with oscillations of 20 or 30 feet, while many smaller swells occur also.

McLean is the most elevated county in central Illinois, and streams flow from it in almost every direction. Nearly one-half of its area

lies between 800 to 900 feet above sea level, while nearly all of the remaining part has an elevation of more than 700 feet. The highest point is 913 feet; the lowest 650 feet above tide.

The basal structure of McLean County is formed by the rocks of the Coal Measures, consisting principally of sandstones and shales. No outcrop of these rocks, however, was seen, for they are deeply buried by a deposit of glacial drift.

The drift, as the material brought down by the ice is called by geologists, is of great depth in McLean County, averaging probably 200 feet. It is apparently thickest in the central and southern parts, where it has a depth of 200 to 250 feet; and thinnest in the northern, where rock is struck at about 100 feet.^a

This material was deposited here by at least two great advances of the ice-sheet, known as the Illinois and Wisconsin glaciations. The former was the first to bring down its load of material, which was covered at a later time by the till of the Wisconsin glaciation. Few exposures of the earlier deposit are seen. The Illinois till is usually much harder than that of the Wisconsin. The latter is rather soft, blue in color, and usually not very stony. Associated with it at various depths are beds of sand and gravel. A few of the gravel knolls have been opened and the gravel used for road material. Very little of the glacial material is exposed, except in cuts, for it is covered by a mantle of silt or loess. This silty layer is remarkably uniform in depth, when we consider the inequalities of the surface upon which it was laid down. In the central, western, and southern parts of the county it has a thickness of from 5 to 10 feet, and usually it is very close to 6 or 7 feet thick, whether it be on the level plains or rolling moraines. It covers the glacial material as if it had fallen like snow. The loess is thinnest in the eastern portion of the county. Over a large part of Cheney Grove, Anchor, Martin, eastern Arrowsmith, and northern Bellflower townships it is not over 3 feet deep. The McLean silt loam occupies areas which have less than 30 inches of this silty material.

The exact mode of the deposition of this loesslike silt is not clearly understood. It must have been deposited during or very soon after the retreat of the ice, as the glacial material shows no evidence of weathering prior to its deposition. The explanation is most probably found in the combined action of wind and water.

SOILS.

The deposition of the layer of silty material over almost the entire upland portion of McLean County has not given an opportunity for a great diversity of soils, and only five types of soil were recognized—

^a Monograph 38, U. S. Geological Survey.

four upon the upland and one along the streams. The names of these types, with the area occupied by each, is given in the following table:

Areas of different soil types.

Soil.	Acres.	Per cent.
Marshall silt loam	574,720	77.5
Miami black clay loam	70,144	9.5
Miami silt loam	58,368	7.9
Kaskaskia loam	20,352	2.7
McLean silt loam	17,984	2.4
Total	741,568

MARSHALL SILT LOAM.

The Marshall silt loam is by far the most important and extensive type of soil found in McLean County. The soil consists of a dark-brown or chocolate-brown silty loam in which the percentage of silt is very high. The large amount of organic matter present gives to it a somewhat more loamy character than might be expected in a soil of this texture. There is also some granulation and slight coherency, especially when wet. When dry, however, the soil crumbles and pulverizes very readily, unless it has been tramped by stock or broken under unfavorable moisture conditions. The rain water is absorbed very readily, as the soil is very porous, and is retained for the use of the crops. To the power which this soil has of absorbing and retaining the moisture for the use of the crops is due in a large measure its productiveness.

The depth of the surface soil varies somewhat with the topography, being deeper where the surface is most level and in the depressions, and shallower where it is more rolling. Upon the more rolling portions of the moraines and along the streams it is sometimes not more than 12 inches in depth, but the usual depth is 16 to 18 inches. Taken as a whole, the surface soil is remarkably uniform in depth, due probably to the fact that the roots of the prairie grass reached to about this depth. The color is due to organic matter, and the soil is darkest where this is present in the largest quantities. This soil is often called black, but is rather a dark-brown or chocolate color. An occasional boulder or pebble was noticed, especially upon the moraines in the eastern part of the county.

The Marshall silt loam is a remarkably uniform soil, considering the large area which it covers. Small areas of second bottom, principally along the Bloomington branch of Sugar Creek, were correlated with this type, although occupying a different topographic position, because they have received the same deposit of silty material as the uplands,

and the soil therefore is very similar. It is underlain here by gravel at about 6 feet, and this gives better drainage.

The subsoil of the Marshall silt loam is a mottled yellow clayey silt, the stains being due to iron oxides or to decaying roots. It is commonly spoken of as clay, but it does not have the heavy, plastic character of clay, although it is usually somewhat plastic, especially when moist. Often, however, it is quite friable. This material usually extends to a depth of 6 or 7 feet. In some of the more level areas it is underlain by a layer of fine sand, but in most instances the silty layer rests directly upon the till. The loess is thinnest in the eastern portion of the county, and the glacial material is quite often found at less than 36 inches. Wherever it is nearer the surface than 30 inches the soil was mapped as McLean silt loam, because this seemed to be the depth at which the till begins to affect the crop-producing power of the soil.

The following analyses show the texture of samples of the Marshall silt loam:

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.
			<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>
9721	3 miles E. of Bloomington.	Brown silty loam, 0 to 18 inches.	2.22	0.40	0.98	0.54	0.76	2.16	71.80	23.28
9723	3½ miles W. of Bellflower.	Brown silty loam, 0 to 18 inches.	3.70	.28	.86	.56	1.20	2.20	68.70	25.50
9725	¼ mile N. of Lexington.	Brown silty loam, 0 to 17 inches.	3.50	.22	.86	.68	1.24	2.88	67.34	25.92
9724	Subsoil of 9723.....	Yellow clayey silt, 20 to 36 inches.	.56	.20	.66	.70	3.36	4.20	72.96	17.70
9722	Subsoil of 9721.....	Yellow clayey silt, 18 to 36 inches.	1.21	.16	.76	.58	1.56	2.94	74.22	19.26
9726	Subsoil of 9725.....	Yellow clayey silt, 19 to 36 inches.	.75	.46	1.18	.66	1.66	2.98	72.56	20.24

The Marshall silt loam covers the greater portion of McLean County, occupying 77.5 per cent of its entire area. It is found in every township, while in many of them practically no other type of soil occurs. This is especially true of those townships lying between the Mackinaw River and the southwestern part of the county.

The surface of this type of soil ranges from gently rolling to rolling. It is made up of a series of undulations, the crests of which usually rise from 5 to 20 feet above the intervening depressions. Near the streams and along the morainal ridges that cross the county almost centrally in an east and west direction the surface is somewhat more

broken. The topography over the greater proportion of the area is such as to give good surface drainage. The depressions or swales through the fields require tiling and a great many underdrains have been put in, but there still remain many areas which could be improved by the use of tiles.

The Marshall silt loam has been formed by the incorporation of organic matter into the weathered product of the silty loesslike layer overlying the drift. The loess is made up largely of angular fragments of only partially weathered ground-up rocks. This material was attacked by the agencies of weathering, plants grew luxuriantly, and each year added their contribution of organic matter; the moist condition of the prairies prevented its rapid oxidation, so that it became intimately mixed with the mineral particles and a rich, dark-brown silty loam was formed.

Corn, oats, and hay are the only crops grown to any considerable extent upon the Marshall silt loam. Of these corn is much the most important. The yields of these crops vary with the seasons and also with the methods of cultivation. The most careful farmers in good seasons obtain from 60 to 80 bushels of corn per acre, and sometimes even more, but the average for the entire area occupied by this type for a period of years lies probably between 40 and 50 bushels. Oats are next in importance to corn and the average yield is about the same. Hay, for which timothy is more widely grown than clover, gives from 1 to 1½ tons per acre. Some difficulty is experienced in getting the clover to catch, especially if there is hot, dry weather at the time the oats, with which the clover is generally sown, are taken off.

The Marshall silt loam is well adapted to the crops at present grown. It is very productive and an excellent soil for general farming. With a proper rotation of crops and careful methods of cultivation it will continue indefinitely to yield profitable returns.

MIAMI BLACK CLAY LOAM.

Upon the level areas in McLean County there is found a type of soil which is heavier in character than the one just described. This type has been found in many other areas, and is called the Miami black clay loam. The soil is a heavy and, especially when wet, rather sticky granular clay loam, containing a large percentage of silt and organic matter. There is a greater difference in the appearance of the Miami black clay loam and the Marshall silt loam in the field than would be indicated by the mechanical analyses. The former contains a larger percentage of organic matter, which increases its water-holding capacity and gives to it a deep black color. This soil possesses the property of granulation in a remarkable degree. As soon as the ground begins to dry it cracks and checks into cubes and the surface becomes very loose. The soil generally extends to a depth of 18

inches. In some instances it is not quite so deep, and in others the subsoil is not found at less than 24 inches.

The subsoil is a mottled yellow or drab-colored clayey silt, which usually shows plasticity, although this property almost always decreases with depth, the material becoming more loesslike. Where the drab color is present the subsoil appears to be more clayey. The subsoil is not very different from that of the Marshall silt loam, the greater plasticity being due largely to the greater amount of moisture present. It sometimes contains iron concretions, and lime concretions are often present. These have been formed, it is believed, from the leachings of the soil.

A different phase of this type occurs in some of the eastern townships, especially in Cropsey and Anchor townships, where a small percentage of gravel and sand, which slightly modifies the agricultural value, is found in both soil and subsoil. The percentage of gravel is seldom more than 5 per cent, and is usually less. The gravel was brought down by the streams and has worked out into the fields. Some *Helix* shells are also found here, as well as small "white spots," which are not very productive.

Mechanical analyses of samples of the Miami black clay loam are given below:

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>
9713	6 miles S. of Arrow-smith.	Black silty loam, 0 to 18 inches.	4.50	0.20	0.70	0.76	5.24	10.90	67.18	15.00
9715	2 miles S. of Danvers.	Black silty loam, 0 to 18 inches.	5.30	.18	.72	.88	6.40	9.20	62.30	20.00
9717	5 miles NE. of Heyworth.	Black clay loam, 0 to 18 inches.	5.03	.32	5.06	4.90	9.04	6.92	53.22	20.32
9718	Subsoil of 9717.....	Gray clayey silt, 18 to 36 inches.	.30	.04	.60	.40	1.12	2.46	75.72	19.32
9716	Subsoil of 9715.....	Clayey silt, 18 to 36 inches.	.93	.24	.50	.60	1.50	2.58	73.94	20.54
9714	Subsoil of 9713.....	Clayey silt, 18 to 36 inches.	.48	.38	1.12	.80	2.10	4.78	68.22	22.36

The following samples contained more than one-half per cent of calcium carbonate (CaCO_3): No. 9713, 1.85 per cent; No. 9717, 4.01 per cent; No. 9718, 6.93 per cent.

The Miami black clay loam is most extensively developed in the northeastern and southeastern parts of the county. Yates, Chenoa, West, Bellflower, Downs, Anchor, Cropsey, Lawndale, and Allin townships show the largest areas of it in about the order named, but small areas are dotted more or less over every township. It is found wherever poor drainage permitted it to form.

The surface of this type is level or very gently undulating; the conditions necessary for its formation are not found in more rolling areas. A rise of 5 feet will usually cause a change to the Marshall silt loam.

When the first settlers came to McLean County they found the areas occupied by the Miami black clay loam wet and swampy, and in many instances water stood on them during the greater part of the year. Before these areas could be brought under cultivation it was necessary to remove this excess of moisture. At first open ditches were principally used for this purpose, but, with the exception of a few large ditches for outlets, tile drains have taken the place of open ditches. In some of the larger areas extensive drainage systems have been put in, and in some instances have cost as much as \$25 an acre. There are many tracts, especially in the northeastern part of the county, which could be much improved by better drainage. The very productive character of the soil and the increase in the yields fully justify the expense.

The Miami black clay loam owes its existence to imperfect drainage. During the dryer part of the year these nearly level or slightly depressed areas were covered with a rank growth of prairie vegetation. As soon as the wetter season began the soil became oversaturated with moisture, which prevented a free access of air, so that only a partial decomposition of the organic matter took place. These areas, therefore, contain a larger percentage of humus than the surrounding more rolling ones, where there was less moisture and a freer circulation of air. The organic matter was incorporated into the weathered silty material, finer particles were floated in from the surrounding areas, and a heavy black clay loam resulted.

The same crops—corn, oats, and hay—are grown upon this type as upon the Marshall silt loam, but the proportion of the area planted in corn is greater, and upon some farms corn is grown almost exclusively. Where the land is well drained and well cultivated corn will average from 50 to 60 bushels per acre and often produce much more, but the average for the entire type is considerably less. Oats will not average more than 40 bushels, much of the crop often being lost through the rank growth of straw and consequent “lodging.” Hay is not grown very extensively, and from 1 ton to 1½ tons per acre represents the usual yield.

When well drained this is an excellent corn soil, and it may even be considered as a typical soil for this grain. Oats produce a rank growth, but are apt to lodge. Clover and grass do well, although the former sometimes heaves rather badly, owing to the freezing and thawing of the soil. Thorough drainage will greatly lessen, if not entirely prevent, the injury sustained from this cause.

There are few soils more productive than the Miami black clay loam. Some areas have been cropped almost continuously in corn

for nearly fifty years without much diminution in the yields, but the effect will undoubtedly be seen if the practice is continued much longer. A rotation of crops will prove to be more profitable in the long run than the continuous growing of one crop.

MIAMI SILT LOAM.

The surface soil of the Miami silt loam consists of a loose, floury silt loam, containing a relatively small percentage of organic matter. The appearance of the soil in the field would indicate a larger amount of fine sand than is found in the Marshall silt loam, but the mechanical analyses show very little difference in the two types, except in the amount of organic matter. When dry and pulverized the soil is like dust. Upon the slopes it is not as deep as upon the more level areas, but the average is 12 inches. The color varies from light brown or gray to almost white, depending upon the organic matter present. Where the subsoil comes near enough to the surface to be turned up by the plow the soil is slightly yellowish. There is usually a change to a lighter color at the plow line.

There is no sharp line of demarcation between the soil and subsoil, but rather a gradation from one to the other. The subsoil is generally called clay by the farmers, and the type is often spoken of as "clay land" or "white-oak land." Although there is a considerable percentage of clay present the subsoil is composed chiefly of the next coarser grade of particles or silt. The subsoil is called, therefore, a clayey silt. It does not show much plasticity, but is rather hard and friable. This material usually extends to a depth of from 4 to 8 feet, and is underlain by the drift which outcrops along the steeper slopes.

The following analyses show the texture of the Miami silt loam:

Mechanical analyses of Miami silt loam.

No.	Locality.	Description.	Organic matter.								
			P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.
9729	4 miles NW. of Danvers.	Gray silty loam, 0 to 10 inches.	1.53	0.14	0.88	0.78	1.78	3.50	72.84	19.80	
9731	5 miles SE. of Bloomington.	Gray silty loam, 0 to 12 inches.	1.36	.50	1.26	1.52	3.86	3.98	67.00	21.50	
9732	Subsoil of 9731.....	Yellow silt, 14 to 36 inches.	.41	.20	1.08	1.06	2.80	3.08	68.74	22.78	
9730	Subsoil of 9729.....	Yellow silt, 12 to 36 inches.	.39	Tr.	.46	.42	.94	3.30	66.30	28.24	

The Miami silt loam is not very extensively developed in McLean County. Its most common occurrence is along the streams. The

largest area is in the northwest part of Danvers Township, and this area is really a part of the one which follows the Mackinaw River as far up as Colfax. It also occurs along Salt Creek, in Empire Township, and Kickapoo Creek, in Randolph Township. Small areas were mapped along other streams. Tracts of considerable extent occur along the front of the moraine, especially where the streams break through it.

This type of soil is found in the most hilly and broken portions of the county. In many places erosion has cut narrow V-shaped gashes in the bluffs along the streams. Between these gashes there are less broken tracts suitable for cultivation, but much of this type is too hilly for general farming. The surface of the area in Danvers Township is especially broken. The character of the topography allows the water to run off readily and underdrainage is seldom necessary.

Erosion has had much to do with the formation of the Miami silt loam. The surface in these areas allowed the water to run off much more readily than upon the more level and less broken areas; therefore the moisture conditions favorable to the growth and preservation of rank vegetation have not been present. The areas occupied by this type represent the original timber land. The prairie grasses with their mass of roots were not present to add each year by their decay large amounts of organic matter to the soil; therefore a lighter, less loamy, and less productive soil has been formed than in that portion of the county where these were found.

The greater proportion of the Miami silt loam is in timber or pasture, but many of the less broken areas are planted to corn, grass, or clover. The yields are variable. Corn will average 25 or 30 bushels, oats the same, and hay from three-quarters to 1 ton per acre. A few areas of wheat were seen in Danvers Township.

The Miami silt loam is not well adapted to corn. Oats do fairly well, and good crops of hay are secured. This soil makes excellent pasture, and its good drainage makes it desirable for orchards. Little attention, however, has been given to the growing of fruits. The light color of the soil shows it to be low in organic matter, and every opportunity should be taken advantage of to preserve and to increase this important constituent. Stable and green manures will prove very beneficial, and their use will make this soil more like the Marshall silt loam.

M'LEAN SILT LOAM.

The soil of the McLean silt loam is not very different from that of the Marshall silt loam, the principal difference in the two types being in the subsoil. It is usually not as deep and will average only 12 inches. To this depth the soil is a silty loam containing a small percentage of sand and gravel. In some small areas these are present in

considerable quantities, but usually the amount is barely enough to be discernible in the field. A few scattering boulders are seen. The color of the soil is usually brown, but in some places areas of slightly reddish-brown occur. Its color is due to organic matter, of which this soil contains a considerable proportion, although the amount is generally less than is found in the Marshall silt loam.

The subsoil is usually divided into two layers. The first one, lying immediately underneath the soil, is a mottled yellow, friable, slightly clayey silt. It is usually hard, especially near the contact with the underlying layer, but crumbles quite readily. This layer is not very different from the subsoil of the Marshall silt loam. It varies much in thickness, but will average about 10 inches. In some local areas it is entirely absent, while in others it extends to a depth of 30 inches below the surface. Below this silty layer is found a gravelly till, consisting of a heterogeneous mixture of gravel, sand, silt, and clay. The percentage of gravel or stones is not very large, and there is a greater amount of silt present than of any other grade of particles. The presence of this till so near the surface is the distinguishing feature between this type and the Marshall silt loam.

The mechanical analyses of fine earth of this type are given in the following table:

Mechanical analyses of McLean 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 0.5 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>
9710	3 miles NW. of Saybrook.	Brown silty loam, 0 to 12 inches.	3.07	0.38	2.30	3.02	7.02	6.08	52.48	28.20
9711	Subsoil of 9710.....	Yellow silt, 12 to 24 inches.	1.25	.66	2.40	2.68	5.92	5.84	53.40	28.70
9712	Subsoil of 9710.....	Silty loam, 24 to 36 inches.	Tr.	.90	2.96	3.56	9.26	7.12	41.70	34.10

The following sample contained more than one-half per cent of calcium carbonate (CaCO_3): No. 9712, 4.05 per cent.

The McLean silt loam occurs in the eastern part of the county. Its greatest development is in Cheney Grove, northern Bellflower, and southern Anchor townships, but small areas are found in some of the surrounding townships.

This type of soil occurs chiefly upon the morainal ridges, and the surface here is rather broken and hilly. Much of it is found as knolls or hills surrounded by more level areas of Marshall silt loam. The character of the topography and underlying material give good drainage, and except in a few of the more level areas tiling is unnecessary.

The layer of silt is thinner in the eastern part of the county than in other parts, and in some small areas is entirely absent. The McLean silt loam represents areas where the glacial material comes within less than 30 inches of the surface. At a greater depth than this the till does not seem to affect the agricultural value of the land. The soil has been formed chiefly by the weathering of the silty material and the addition of organic matter. Below an average depth of 22 inches the subsoil has been derived from the glacial material.

Corn, oats, and hay are the principal crops. Corn averages 30 or 35 bushels, oats about the same, and hay from three-quarters to 1 ton per acre.

The type is adapted to the crops grown. It is a fair soil for general farming, but is less desirable than the Marshall silt loam. More careful treatment is necessary to maintain its productiveness, and care is necessary to prevent washing. The type would apparently form desirable orchard sites.

KASKASKIA LOAM.

The surface soil of the Kaskaskia loam usually consists of a dark-brown silty loam or loam which sometimes contains a small percentage of sand and gravel. It varies considerably in different places, being generally heaviest where the surface is lowest. The soil contains a relatively large quantity of organic matter, and this gives it a dark-brown color. There is usually no sharp line between the soil and subsoil, and often very little difference in the character of the material. The most noticeable change comes at about 14 or 16 inches. The subsoil is usually heavier, contains less organic matter, and is of a more pronounced drab or mottled yellow color than the soil. About 7 acres of peat are found in section 5, Allin Township, an area too small to show upon the map.

The following analyses of samples of the Kaskaskia loam are given:

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.
			<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>
9708	4 miles NE. of Covell	Black silty loam, 0 to 16 inches.	5.23	0.16	0.76	0.68	4.40	9.12	64.96	19.58
9709	Subsoil of 9708.....	Yellow silty loam, 16 to 36 inches.	.50	.32	1.02	.78	2.74	5.60	74.76	14.76

The Kaskaskia loam is found only along streams, usually in strips less than one-quarter of a mile in width. The largest areas occur

along Kickapoo and Sugar creeks and the Mackinaw River. The generally level character of the surface is broken only by the presence of old stream channels. Much of it requires artificial drainage to render it fit for cultivation.

This soil is of alluvial origin. It has been brought down from the uplands by rains and deposited along the streams during times of overflow.

The Kaskaskia loam is largely in pasture. Some of the larger areas are planted to corn, and yields of 40 or 50 bushels are secured in favorable seasons. The soil makes fine pasture land, and it also produces good corn, but there is always some danger from overflow.

AGRICULTURAL METHODS.

There are a great many farmers in McLean County who use the most improved methods in cultivating their land; still there are a great many others, both owners of land and tenants, who do not handle their land in the best way to maintain its productiveness. As the tenant usually stays upon the same farm only a comparatively short time, it is not to be expected that he should be greatly interested in maintaining the productiveness of the land, and often the owner does not set him a very good example in this respect. However, there is a great tendency to improvement in the methods of agriculture, and much has already been accomplished in this direction. The best agricultural papers, bulletins of the experiment stations, and other agricultural literature circulate freely among the farmers and have contributed in no small degree toward this improvement. Many of the farmers are exceptionally well informed on agricultural subjects.

The chief interest in cultural methods centers in the cultivation of corn, because this is the staple crop of the county. Fall plowing for corn is almost universally practiced on stubble ground. The ground is broken some 6 or 7 inches deep, occasionally with walking plows, but usually with gang and sulky plows. Probably one-half of the land planted to corn each year is treated in this manner. The other half, which was in corn the previous year, is broken in the spring after the stalks have been raked up and burned or else chopped into short pieces with a rotary stalk cutter. It is then prepared with disk or tooth harrows, and a roller is often used. This land is rarely broken so deep as the fall-plowed land. The latter is disked deeply in the spring and sometimes harrowed once or twice afterwards, the treatment depending somewhat upon the season. The corn is usually put in with a check planter in rows 3 feet 6 inches apart, and two or three stalks are left in a hill. The ground is usually harrowed once after planting and then cultivated three or four times. Fully 50 per cent of the corn is cultivated with large shovel cultivators. Small shovel or surface

cultivators are used for the remainder, but there are very few of the latter at present in use. These leave the soil in better condition and their more general use is to be recommended. The corn is nearly all husked by hand in the field, then cribbed, shelled, and marketed whenever the owner wishes to sell. Most of the corn is sold at the elevator, but some elevators are owned by the farmers. A small proportion of the corn stover is harvested for fodder, most often with a corn binder, followed by a wagon into which the loose ears are thrown. An elevator for unloading the corn from the wagon and depositing it in the crib is coming into general use. The same machine can be used to unload oats. The farmers generally use some care in selecting seed corn, much of it being selected at the time of husking. There is one large tract of land in the county upon which the breeding of seed corn is carried on extensively.

Oats are generally sown in the corn land with an end gate or some other seeder and disked in. Sometimes the ground is harrowed after disking. When mature the oats are cut with self-binders. They are usually thrashed from the shock.

Grass and clover are sown in the oats. If the ground is harrowed after disking, they are sown before the last harrowing. There is little difficulty in getting a stand of clover unless there is very dry hot weather at the time the oats are taken off. The first crop of clover is generally cut for hay, while the last is used for seed. The hay is stacked in the field or put in barns and very little of it is shipped out of the county.

The rotation considered by the most progressive farmers as best adapted to the conditions in this area is two years of corn, one year of oats, and one year of clover or grass, preferably the former; but this rotation is not generally followed. Clover is often omitted or sown only once in eight or ten years. Many grow as much corn as possible. The land is planted to this grain for three years or more, then sown in oats for one year, and then in corn again. Clover or some other legume should be introduced into the rotation once in four or five years at least, as this will materially assist in maintaining the productiveness of the soil. This is especially true of the Miami silt loam, although it applies also to the other soils in the area. Manure spreaders are coming into general use, and some farmers carefully save all the manure made on the farm, but this is not the rule. The raising of more and better stock to consume all the products of the farm and to make more manure, the more careful husbanding of that manure when made, the growth of more legumes to supply organic matter and nitrogen to the soil, the growing of more fruit upon the Miami silt loam, and the incorporation of more organic matter into this soil would, it is believed, result in greater profits to the farmers.

AGRICULTURAL CONDITIONS.

McLean County is preeminently an agricultural county. Her fertile prairies yield abundant harvests and her farmers are generally well to do and prosperous. The value of the land and improvements was at the time of the last census \$61,161,240.

Few of the farms are encumbered and most of the farmers are making money. The descendants of many of the early settlers, who took up or bought land while it was cheap, now have independent fortunes and have left the farms and moved into the towns. The farmhouses, especially upon farms cultivated by the owners, are well built and comfortable, and some of the farmers have handsome residences. Good, substantial, painted barns and other outhouses and well-kept Osage-orange hedge fences are among the improvements which are seen upon almost every owner-cultivated farm, the total value of the buildings generally ranging from \$2,000 to \$4,000. The houses of the tenants are not nearly so pretentious nor are the farms so well cared for. In many cases \$800 will represent the value of the buildings and improvements. The average value of the farm buildings for the entire county is about \$1,400.

The United States census of 1900 shows that 39.5 per cent is farmed by owners, 9.1 per cent by part owners and tenants, 1.2 per cent by managers, 30.6 per cent by cash tenants, and 19.6 per cent by share tenants. It is thus seen that more than one-half of the land is cultivated by tenants, while nearly one-third of the land in the county is held by cash renters. For the best farms these men pay the owners from \$5 to \$6 and more rarely \$7 an acre. The poorer farms rent for from \$3 to \$5 an acre. Share tenants usually pay one-half of the corn, delivered at the nearest elevator—each party paying for one-half of the cost of shelling—and two-fifths of the oats, also delivered. As a rule the tenants consider it more profitable to pay the ruling cash rents than to share the crop with the owner. As already inferred, the rented farms are rarely given as good care as are those which are cultivated by the owners, the tenant looking only to immediate returns. In fact, it is usually possible from the appearance of the buildings and farm to tell whether the land is cultivated by the owner or by a tenant. The tenants move quite often, and this tends to increase the evils of the system.

According to the census of 1900 the average amount of land under one management in McLean County is 151.4 acres. The average amount to the landowner is considerably more than this figure. There are many tracts of land containing an entire section, and there are several men who own from 2,000 to 3,000 acres. These estates are divided among tenants, usually in 160-acre farms. Money Creek, Gridley, Lexington, Martin, Funks Grove, Bellflower, and Mount

Hope townships each have some farms of this description. Hudson and Danvers townships, the southeastern part of Dawson township, and the vicinities of Saybrook, Leroy, and Lytleville are areas of small farms.

There is a strong demand for land here and the prices are high, having increased greatly within the last few years. Farms which ten years ago could have been bought for \$70 or \$80 an acre now bring \$125 to \$150 per acre. The price varies according to the character of the soil, location, and improvements. The Marshall silt loam and Miami black clay loam are esteemed most valuable, and the average price asked for farms upon these two types ranges from \$125 to \$150 an acre. Some farms have sold for as much as \$175 an acre. The Miami silt loam is considered the least desirable of the three, and ranges in price from \$50 to \$100 an acre, though some of the more level areas may bring a little more. There is not very much land in the county which could be bought for less than \$100 an acre.

The farmers of McLean County each year spend between \$600,000 and \$700,000 for labor. White labor is employed exclusively. Most of this comes from Indiana, Ohio, Kentucky, Tennessee, and southern Illinois. The average wage paid single men is \$20 a month and keep, while married men usually receive \$25 a month. Very little complaint is made of lack of efficiency of the laborers, but it is often difficult to procure men contented to remain for any considerable length of time in one situation. Except during the harvest season, and especially during corn husking, there seems to be little difficulty in securing enough farm labor. The large amount of corn grown here requires a great many hands at the time when it needs to be harvested—many more than are necessary at other periods of the year—and therefore laborers are much in demand. Good wages are paid labor during this period, and many men attracted by the high wages come from other places. These are usually paid 2½ cents a bushel with board, or 3 cents without board, but during the present year (1903) the price has been increased to 3 and 3½ cents, respectively.

The chief agricultural products of McLean County are corn, oats, and hay. Of these, corn is by far the most important. McLean County ranks as the first county in the State and as the second in the United States in the number of bushels of corn produced. According to the Twelfth Census the crop of 1899 reached 15,932,780 bushels. About 60 per cent of the cultivated area of the county is planted to this crop. A good quality of corn is grown, the larger part of which is shipped out of the county.

The oats crop is second in importance to corn, and this county ranks third in the State in the number of bushels produced. Nearly 30 per cent of the cultivated land in the county is sown in oats, and about 1,000,000 bushels are produced annually. They are considered less

profitable than corn, and are grown principally in order to furnish a step in the rotation of crops.

Hay is produced in considerable quantities, but the acreage of this crop is small as compared with the two mentioned above. Timothy is more extensively grown than clover, although the latter is more beneficial to the soil. The average yield is from 1 to 1½ tons per acre. The greater part of the hay is consumed in the county. The introduction of more clover into the rotation is to be strongly recommended. Alfalfa can be successfully grown also, but inoculation of the soil is often necessary.

At the present time wheat is confined to a small area northwest of Danvers. Nearly every farmer has a patch of Irish potatoes, but they are not grown on a commercial scale. Fruits are restricted to small orchards for home use, but as has been already said there is excellent opportunity for the commercial development of this industry upon the Miami silt loam. There is considerable live stock in the county, but most of the farmers prefer to sell the grain rather than to feed it. Some fine registered cattle were seen. As a general thing the tenants have not the capital necessary to engage in stock raising.

As there is no great difference in the texture of the soils of McLean County there is not an opportunity for much diversity in crops. Both the Marshall silt loam and the Miami black clay loam are recognized as fine corn soils. It would be difficult to suggest a crop better suited to these soils, or to mention two soils better adapted to the growing of corn. The Miami silt loam is not so well adapted to corn, and is used more for pasture. The possibilities for using this type for fruit have not been recognized. Small fruits, as strawberries, raspberries, and blackberries, as well as orchard fruits, would do well. Some wheat is grown upon this soil, and it is said to produce a berry of good quality.

McLean County is well supplied with railroads. These radiate from Bloomington in all directions. The Chicago and Alton crosses the county in a northeast and southwest direction; the Cleveland, Cincinnati, Chicago and St. Louis and the Lake Erie and Western cross almost at right angles to this; the Illinois Central runs north and south, through Colfax a little north of east, and two other lines of the same system cross the southeastern part, which is also touched by the Wabash; and the Toledo, Peoria and Western traverses the northern part of the county in an east and west direction. There are few points in the county more than 6 miles from a railroad. These railroads furnish ready and easy communication with Chicago and other markets of the country.

Good dirt roads have been laid out upon nearly every section line, and although these become almost impassable in some places in the winter and early spring, during the greater portion of the year heavy loads can be hauled over them. These dirt roads are usually well

graded and many of them are tiled. In the hilly areas no attempt has been made to follow the natural grade and it is impossible to draw heavy loads over many of the hills.

McLean County is well situated in regard to markets. Chicago is only 126 miles from Bloomington, St. Louis 154 miles, and Peoria 47 miles, while many smaller towns are not very far away. Bloomington is a city of nearly 25,000 inhabitants; Chenoa, Leroy, and Lexington have more than 1,500, and many smaller towns and villages are found in every part of the county. Besides the villages, grain elevators are found along the railroads every 4 or 5 miles, so that few farmers have to haul their grain more than 6 or 7 miles to a point of shipment.

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