

SOIL SURVEY OF WEBSTER COUNTY, MISSOURI.

By J. A. DRAKE and A. T. STRAHORN.^a

LOCATION AND BOUNDARIES OF THE AREA.

Situated in southern Missouri, a little west of the center, Webster County includes within its boundaries about 605 square miles of the most elevated portion of the Ozark uplift or plateau. It is nearly rectangular in shape, with the extreme dimensions $28\frac{1}{2}$ miles long by 22 miles wide, and lies about 50 miles from the Arkansas and about

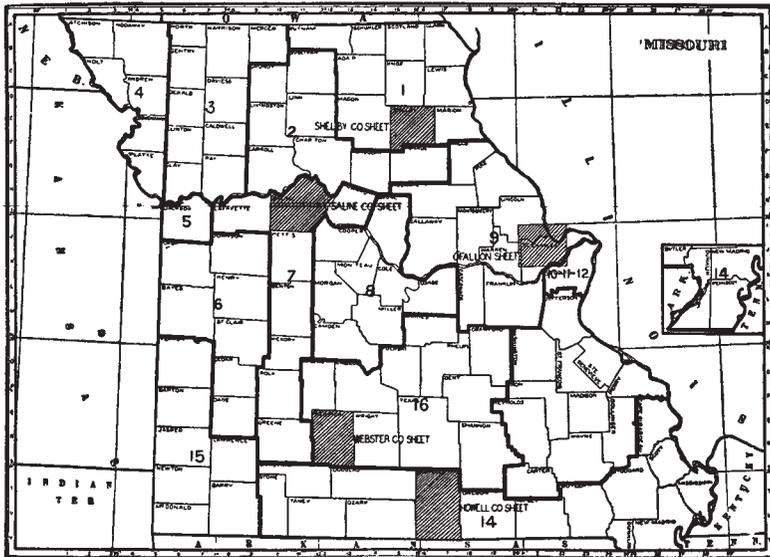


FIG. 35.—Sketch map showing location of the Webster County area, Missouri.

90 miles from the Kansas line. It is situated along the main line of the St. Louis and San Francisco Railroad, over which it has direct connection with St. Louis, distant about 200 miles, and over the Kansas City, Fort Scott and Memphis branch of the same road with Kansas City, about 225 miles away. Springfield, the junction of these two lines, is situated about 20 miles west in an adjoining county.

^a During a part of the time Messrs. Charles W. Ely and Frank Bennett assisted in the prosecution of the field work.

Within the area are no large towns. Marshfield, the county seat, has a population of 1,200. Seymour, Niangua, and Fordland are smaller but thriving railroad towns. Away from the railroad only small villages and country cross-roads stores are found.

HISTORY OF SETTLEMENT AND AGRICULTURAL DEVELOPMENT.

The first white settlers came to what is now Webster County about 1834, mainly from Kentucky and Tennessee. A large movement from these States soon followed, which afforded this portion of Missouri its pioneers and contributed much to its growth. At this time it was not the agricultural value of the country which attracted the settlers so much as the advantages which it afforded as a hunting ground and as a region where stock raising could flourish with little effort. Game and fish were abundant, and everywhere there was a luxuriant growth of the native blue stem grass, on which cattle thrived the year round. Hogs were raised and fattened on nuts alone. There was no necessity, therefore, of growing much grain, and accordingly it became the custom to settle near a spring, regardless of the adaptability of the surrounding land for this purpose. The little grain needed was grown along the bottoms of the small streams or in the draws. In this way many of these earlier settlers came into possession of what in future years proved to be the poorer farms of the area.

It was not until 1855, and under some of the conditions described, that the county was organized. The growth in population is shown to have been rather slow, as the increase was only a little over 1,000 during the fifteen years from 1856 to 1870. In 1870 the main line of the St. Louis and San Francisco Railroad was completed, since which time the growth has been more rapid.

About 1870 the native grass, which had been an important factor in the agriculture of the county, began to disappear, and the conditions to change quite generally. Prior to this it had been the custom to burn over the pasture fields and woodlands every spring, but as the country became more thickly settled and more or less fenced this custom had to be abandoned, and a thick growth of underbrush, which had been kept down by the annual fires, sprang up in the open and more timbered fields and choked out the grass, while settlement and cultivation were already beginning to reduce the acreage of the natural range to a marked degree. These changes brought about an increased acreage of grain and other cultivated crops. This system of farming embracing only a few crops, corn being the most important, has continued with but little change up to the present time.

In 1892 some large apple orchards were set out in the vicinity of Seymour, in the southern part of the county, but fruit received com-

paratively little attention throughout the county until 1901, when there occurred a season especially suited to the production of an extra good apple crop. Farm crops were quite generally a failure, owing to drought, and the farmers found the small orchards planted for their own private use a source of no small income. This led to an increased interest in apple culture, and the acreage in orchards was extended in nearly every part of the county. As a result, the orchard of from 500 to 2,000 and 3,000 trees, two and three years old, is very common. Since the big crop of 1901, however, the fruit crop has been almost a failure, and at present very few orchards are being set out.

CLIMATE.

The climate of Webster County is rather mild. The heat of the summers is not, as a rule, oppressive, and the winters are quite generally open, being made up of alternating periods of mild and moderately cold weather. The thermometer does not often record a temperature below zero, and a rise in temperature generally follows immediately. What little snow falls is quickly melted. The warm periods are very often sufficient to start the fruit buds early in February, in which case they are almost invariably killed by later freezes. Probably this constitutes the most serious hindrance to the fruit-growing industry in the area and is responsible for most of the failures. An occasional dry spring is quite favorable to the fruit crop, other conditions being equally so. Short periods of drought occur, but are not common to any particular season of the year. With this exception the precipitation is well distributed throughout the year, as is shown by the accompanying table, compiled from records of the Weather Bureau.

Normal monthly and annual temperature and precipitation.

Month.	Springfield.		Seymour.		Month.	Springfield.		Seymour.	
	Temperature.	Precipitation.	Temperature.	Precipitation.		Temperature.	Precipitation.	Temperature.	Precipitation.
	° F.	Inches.	° F.	Inches.		° F.	Inches.	° F.	Inches.
January	32.3	2.48	34.2	2.81	August	74.0	3.65	75.7	3.74
February	34.7	3.15	30.6	2.52	September ..	67.7	3.76	67.8	3.36
March	43.5	3.72	43.6	4.75	October	56.0	3.06	58.5	3.45
April	57.5	3.84	55.3	4.15	November ..	43.5	3.11	44.9	3.10
May	63.2	5.97	65.6	5.67	December ..	38.6	2.64	33.9	2.24
June	72.4	4.46	71.7	4.39	Year	54.9	44.17	54.8	43.47
July	75.7	4.33	76.2	3.29					

Seymour is situated in the southeastern part of the county and Springfield in Greene County, the next adjoining county on the west. The frost records of these same stations show the average date of

last killing frost in spring to be April 13 at Springfield and April 15 at Seymour, and the first in fall October 30 at both stations.

PHYSIOGRAPHY AND GEOLOGY.

The topographic features of Webster County, though somewhat varied, show a marked similarity throughout. The greater portion of the county has been subjected to severe erosion, which has caused many changes in the once comparatively level surface of the elevated plateau. Considerable differences of elevation have thus resulted and a series of stream channels cut out, which, with their smaller tributaries, have divided the surface into irregular ridges and undulating table-lands. These are sometimes separated by narrow strips of bottom land or merely in other cases by the streams or draws themselves.

Occurring as it does in the most elevated portion of the Ozark Uplift, Webster County forms a part of the main divide between the tributaries of the Missouri River on the north and those of the Arkansas on the south. Of the former, the Osage River branch of the Gasconade and the two branches of the Niangua have their sources near the center of the county and leave its borders on the north, while the Pomme de Terre rises about 2 miles west of Marshfield and flows out of the county to the west. Of the latter the James Fork of White River is the most important. It is formed by the junction of a few small streams a short distance northeast of Seymour, and taking a generally western course leaves the county about 7 miles south of the center. Findlay Creek, a tributary of the James Fork, together with Beaver Creek, has its source in the extreme southern part.

The dividing ridge between these two drainage systems may be traced from the western line of the county along the main line of the St. Louis and San Francisco Railroad to the vicinity of Marshfield; thence it takes an irregular southeastern course to the vicinity of Seymour, and is followed by the Springfield and Memphis branch of the same system out of the county. From this divide another one extends northeast between the Osage branch of the Gasconade and the Niangua rivers, another northwest between the Niangua and the Pomme de Terre, while still another lies to the west of Seymour between the James River and Findlay Creek. This makes up the topographic outlines of the area, but these main ridges are cut by the tributaries of the more important streams into innumerable ridges of varying widths, the slopes of which are either precipitous and deeply gullied by draws or descend with a gentle and graceful curve to the stream below. In the vicinity of the larger streams the topography is generally rugged and more broken, and the ridges between the tributary streams often end in a precipitous bluff 50 to

200 feet high. Back from the bluff lines the country generally becomes less deeply cut, with more gentle slopes, and finally merging in many cases in a gently rolling table-land on the crest of the main divide. The most notable instances of this occur about Seymour and west and northwest of Marshfield, while minor areas of this sort are of frequent occurrence throughout the county. These table-lands are occupied by the Clarksville silt loam, the surface of which is generally free from stone; but as the streams are approached the predominating type is the Clarksville stony loam, unless on an occasional long and gentle slope, where the silt loam covers the greater area. On the accompanying map the streams are put in in some detail, as they bear an important relation to the soils. The smaller ones, however, are often mere draws or small ravines in which there is no water except when it rains, but a great many like the larger streams are perennial, being fed by springs, in which the area abounds.

The greatest elevation of the main divide is southeast of Seymour, where the surface rises to 1,654 feet above sea level. Along this ridge there is a gradual decline to the westward to 1,457 feet at Northview. The general elevation of the county is found between these figures. This is about the maximum elevation in the State. Taken in connection with the great number of ramifying streams the elevation and rolling or hilly surface afford ideal drainage conditions throughout the entire area.

The geological formations that give rise to the soils are of sedimentary origin, belonging to the Lower Carboniferous and Devonian limestone series, of which the St. Louis limestone is the most prominent. Below this lies a bed of coarse-textured shale, with interbedded layers of limestone, probably of Devonian age. The latter formation is present in nearly all parts of the area, but varies somewhat in thickness. In places it has been weathered away. West of Marshfield a cut exposes a thickness of about 15 feet, and then does not reach to the base of the formation. Below the shale is a massive formation of sandstone, generally white, and of medium fine texture, which outcrops in the bottoms of many streams, but affects the soils of the area comparatively little. It is most prominent about Marshfield, where its effects on the soil are marked, giving rise to a few small areas of fine sandy loam.

None of the soil types as found in the area can be said to be derived from any one of these formations exclusively, as occasionally all contribute more or less material. In a general way, however, the first-named formation is the most important in the formation of the Clarksville stony loam and is largely responsible for the Clarksville silt loam on the higher ridges. In the vicinity of Marshfield and northwest of that place the shale has contributed more or less to the latter type. In the case of the sandy loam much of the material

has been derived from the upper formations, but the sandstone is responsible for its sand content.

SOILS.

The soil map accompanying this report shows in colors six different soils. Two of these, Rough stony land and Riverwash, are of so little value as to be practically nonagricultural; the other types have already been established in earlier surveys, having been found first in the survey made around Clarksville, Tenn.

The Clarksville stony loam and Clarksville silt loam also occur in Howell County, Mo.

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Clarksville stony loam	212,092	55.1	Rough stony land.....	3,200	0.8
Clarksville silt loam	147,712	38.2	Riverwash	1,856	.5
Clarksville loam.....	17,600	4.5	Total	886,944	-----
Dekalb fine sandy loam.....	3,584	.9			

CLARKSVILLE SILT LOAM.

The Clarksville silt loam is the second soil in extent in the area. The surface soil is a yellowish-gray silt loam with an average depth of 10 inches. Below this, to a depth of 36 inches, the material is a heavy compact silt loam to silty clay, and there is a decided change in color, which becomes yellowish brown mottled with gray. There is a marked deficiency in organic matter throughout the type. Even in the woodlands the proportion is very small and confined to the upper 2 or 3 inches, and this disappears after a few years of cultivation. Unlike most soils of this texture, low in organic matter, it does not become compact and hard, but remains loose and friable under most unfavorable conditions. The surface is quite free from stones, excepting small patches, and rock fragments are only occasionally encountered in the subsoil, usually at from 25 to 32 inches below the surface. It has an excellent water-holding capacity and responds more readily to applications of manure and the rotation of crops with clover than any of the other soils of the area.

In many instances, where it is apparent that this soil and the Clarksville stony loam are derived from much the same formations, this freedom from stone on the surface and in the subsoil seems to be the chief difference between the two. But this in itself gives rise to other differences of importance. The rock fragments of the Clarksville stony loam render its soil and subsoil more open, and consequently it is less able to withstand drought, while on the other hand the Clarksville silt loam is more subject to the effect of prolonged wet weather. The silt loam is thought by many to be more

easily reduced in productiveness by continued farming than the stony loam, which is probably true.

The Clarksville silt loam is quite well distributed throughout the area. It occurs on undulating ridges, in somewhat rolling table-lands, and on long and gentle slopes. The most important areas occur about Marshfield, west and northwest from that place toward Elkland, and in the vicinity of Seymour. These areas mark parts of the country very desirable for general agriculture. The elevation and topography are such as to provide good surface drainage, while at the same time the type as a whole suffers little from erosion.

The materials forming this soil are derived from the weathering of limestone and shale. On the broader ridges and more level uplands the soil left by this process has remained undisturbed by running water and is of good depth, but on the narrower ridges and steeper slopes conditions have been the reverse and a thinner covering is found.

The soil seems to be especially adapted to wheat and clover, but other crops do well. It is probably not so well suited to orcharding as the Clarksville stony loam. The average yield per acre of wheat ranges from 10 to 12 bushels, of corn 18 to 25, and hay (clover and timothy mixed) from 1 to 1½ tons. These yields are low as compared with the possibilities of this soil under better management. As previously stated, the organic-matter content is very low; and only in proportion as this is increased and as a more systematic rotation of crops and better cultivation are practiced can this type be expected to yield better returns. The plowing under of clover and cowpeas, both of which grow very satisfactorily, is imperative, while all other roughage similarly treated can but be beneficial.

The following table shows the texture of typical samples of the soil and subsoil of this type:

Mechanical analyses of Clarksville silt loam.

No.	Locality.	Description.	Fine gravel, 2 to 1	Coarse sand, 1 to 0.5	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 mm.
			P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.
12370	1½ miles E. of Rogersville.	Gray silty loam, 0 to 10 inches.	0.6	2.1	1.1	2.0	4.7	69.8	19.7
11895	1½ miles W. of Marshfield.	Gray silty loam, 0 to 10 inches.	.9	3.0	1.3	2.2	1.6	67.7	22.8
12371	Subsoil of 12370	Silty clay, 10 to 36 inches.	.5	1.0	.6	1.2	3.4	59.7	33.4
11896	Subsoil of 11895	Brown silty clay, 10 to 36 inches.	.8	1.6	.6	1.6	1.3	58.1	35.6

CLARKSVILLE STONY LOAM.

The Clarksville stony loam prevails over much the greater part of Webster County. The surface 9 inches consists of from 20 to 50 per cent of rough angular rock fragments, largely chert, but in some instances mingled with sandstone and magnesian limestone embedded in the residue of their decay. The soil is of a light-gray color, with here and there a slight yellowish tinge, and has a peculiar silty texture. The clay content gradually becomes greater and the color darker with depth until at 25 inches it is a red clay, usually containing less rock fragments than the soil, although an equal quantity is not uncommon.

The rock fragments in this soil and on its surface have the effect of preventing packing or baking, which effect is especially desirable in orcharding. They also retard washing, though, on account of the open porous condition thus produced, crops quite generally suffer more from a lack of moisture on this type than on the others in the area.

The Clarksville stony loam is found in all parts of the area, occupying the narrower ridges and their slopes. It occurs, also, on rounded eminences that have been protected by the rocks from erosion. On the whole the topography is uneven, broken, and often rugged. The drainage is excellent.

The Clarksville stony loam is formed by the weathering and breaking down of various rock formations. Chief among these is a very cherty limestone, which, on account of its great resistance, remains in fragments scattered through the soil, the proportion being less in the more level areas and greater on the slopes, where more of the soil has been removed by wash.

The number of farm crops grown on this soil is limited and the yields moderate, varying much with the season. Corn ranges from 15 to 30 bushels, wheat from 8 to 10 bushels, and hay (clover and timothy) from 1 to 1½ tons per acre. Oats are very little grown, but yields varying from 15 to 30 bushels have been produced. Cowpeas give fairly good yields during an average season. The soil shows the same deficiency in organic matter as the Clarksville silt loam, and this is doubtless largely responsible for the low yields. It should receive the same treatment recommended for the Clarksville silt loam.

The Clarksville stony loam is believed to be the best fruit soil of southern Missouri, and it is largely this type that has won for this section of the State its reputation as a fruit-growing district. Its adaptation in different parts of the area to apples, peaches, pears, plums, small fruits, and grapes has been proved beyond question. Local climatic conditions may be more favorable to one or another of these fruits, but taken as a whole the apple probably does best in this

area. In good seasons an abundance of fruit of an excellent color, quality, and flavor is produced.

The following table gives the results of mechanical analyses of the fine earth of the soil and subsoil of this type:

Mechanical analyses of Clarksville stony loam.

No.	Locality.	Description.	Fine gravel, 2 to 1	Coarse sand, 1 to 0.5	Medium sand, 0.5 to 0.25	Fine sand, 0.25 to 0.1	Very fine sand, 0.1 to 0.05	Silt, 0.5 to 0.005	Clay, 0.005 to 0
			mm.	mm.	mm.	mm.	mm.	mm.	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>
12376	¼ mile E. of North-view.	Gray silty loam, 0 to 10 inches.	2.6	3.3	1.3	3.2	3.0	64.6	21.4
12374	2½ miles E. of Fordland.	Gray stony silty loam, 0 to 10 inches.	2.1	1.9	.8	1.7	2.1	69.1	21.8
12377	Subsoil of 12376	Red silty clay, 10 to 36 inches.	1.9	2.3	.8	2.9	2.4	59.4	30.2
12375	Subsoil of 12374	Brown stony clay, 10 to 36 inches.	1.6	2.3	.8	1.8	2.2	38.8	52.5

CLARKSVILLE LOAM.

The soil of the Clarksville loam consists of a dark-brown silty loam, with an average depth of 12 inches, the organic content of which is materially higher than in the upland types. The proportion of sand, which is fine in texture, occasionally becomes more noticeable in the ordinary field examination, but the greater part of the area is a typical silt loam. The remainder of the profile to 36 inches is a brown silty loam slightly heavier than the surface soil, but of about the same character of material. This is especially true in the broader and better defined valleys of the larger streams, where the type is almost entirely alluvial. Where it is found in narrower strips along the smaller streams the subsoil contains more or less gravel and the surface soil is often thin.

The type is well distributed throughout the area, but is most extensive along the Osage Fork of Gasconade River. In this valley and in the rest of the broader ones it occurs as a well-defined bottom land which has a level topography. While subject here to an occasional overflow, which generally does little damage to crops, it has ample drainage. In the upper and narrower valleys it usually has a slight slope to the stream, which affords a surface drainage slightly better than in the larger areas.

In the process of formation the material of the Clarksville loam has been largely derived from wash from the uplands and slopes. Where it occurs along the more important streams the material has

been carried down and deposited in times of overflow. It is pre-eminently the corn and grass soil of the area. The average yield of the former ranges from 40 to 50 bushels per acre, while as high as 75 and 80 bushels have been obtained. Hay yields from 1½ to 2 tons, and occasionally even 2½ tons, per acre. As pasture, 1 acre is equal to from 3 to 5 acres in the uplands, according to the season. This, together with its ability to produce corn, has induced the farmers owning much bottom land to keep more stock, which contributes in no small measure to their success. Unless it has been under cultivation many years, this type is not well suited to the production of wheat, which grows too rank and lodges. The yield ranges from 14 to 20 bushels per acre. Small fruits do well, but are little grown in the area. Orchards make an excellent growth and are thought to be longer lived than on the uplands, but the fruit is more likely to be injured by frost. Tomatoes thrive best on this soil and have been known to yield as many as 300 bushels per acre.

The following table gives the results of mechanical analyses of the Clarksville loam:

Mechanical analyses of Clarksville loam.

No.	Locality.	Description.	Fine gravel, 2 to 1	Coarse sand, 1 to 0.5	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0 mm.
			P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.
12364	2 miles SW. of Northview.	Brown silty loam, 0 to 12 inches.	0.0	0.3	0.2	1.3	4.3	84.4	9.5
12366	6 miles NE. of Elkland.	Silty loam, 0 to 14 inches.	.1	.5	1.1	10.7	4.7	65.3	17.5
12365	Subsoil of 12364.....	Brown silty loam, 12 to 36 inches.	.0	.2	.2	1.4	3.1	83.4	11.5
12367	Subsoil of 12366.....	Brown silty loam, 14 to 36 inches.	.2	.4	.9	9.1	5.2	64.8	19.5

DEKALB FINE SANDY LOAM.

The soil of the least importance is the Dekalb fine sandy loam, which is confined to a few small areas. It consists of a light to yellowish gray fine sandy loam 9 inches in depth, underlain by a yellow or yellowish-brown fine sandy loam, the clay content of which increases materially in the lower part of the profile. Although, like the other upland soils of the area, it is quite deficient in organic matter, it is loose and friable and easily kept in good tilth.

This type of soil is found north, west, and east of Marshfield, where the thick and massive sandstone formation that underlies the

other formations entering into the soils of the area comes to the surface. The soil occurs generally on gentle slopes where erosion has exposed the sandstone, and all areas have excellent drainage.

A large part of the type is not under cultivation. The remainder produces all the ordinary crops of the area. It is more especially adapted to peaches, truck, sweet potatoes, and other crops adapted to a light-textured soil, but has no special importance owing to its small extent.

The following table gives the results of mechanical analyses of typical samples of the Dekalb fine sandy loam:

Mechanical analyses of Dekalb fine sandy loam.

No.	Locality.	Description.	Fine gravel, 2 to 1	Coarse sand, 1 to 0.5	Medium sand, 5 to	Fine sand, 0.25 to 0.1	Very fine sand, 0.1 to	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0 mm.
			mm.	mm.	0.25 mm.	mm.	0.05 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>
12378	6½ miles NW. of Marshfield.	Fine sandy loam, 0 to 9 inches.	0.3	0.5	6.7	46.7	5.0	32.6	8.0
12379	Subsoil of 12378	Yellow heavy fine sandy loam, 9 to 9½ inches.	.4	.6	5.1	35.4	3.9	34.6	20.1

ROUGH STONY LAND.

Occurring along some of the streams and the deeper and more important draws are found areas too steep and stony for successful cultivation, even in orchard. The great part of the soil has been washed away and has left the surface very rough. These have been mapped as Rough stony land. The stones are usually so large as to make plowing impracticable, even if the slope were not too steep. Most of the areas are in timber and afford but little pasture, but many could be cleared without danger of great damage by washing until the grass could get a foothold, and would in a few years afford fairly good grazing.

RIVERWASH.

There occurs along many of the streams a strip varying from 8 to 30 rods in width which is composed principally of gravel, rounded rocks, and sand. Such areas have been classified as Riverwash. They are, on the whole, subject to annual change and are cut by meandering stream channels. In its typical form the soil has no agricultural value. It is present along almost all the streams to some extent, but usually the areas are too narrow to be shown on a map of the scale used in this survey.

AGRICULTURAL CONDITIONS.

Although the wealth of Webster County is almost entirely agricultural, its agricultural resources have not nearly attained the development of which they are capable. Of the 386,944 acres, the total area, about 275,000 acres are in farms, of which about 150,000 acres are classed as improved, the remainder being uncleared or otherwise unsuited to cultivation. Except in the case of a comparatively few farmers here and there, the practices are not the most modern or businesslike, and there is much about the average farm premises to indicate a condition none too prosperous, although, on the whole, the financial condition of the farmers is gradually becoming better. Formerly about 40 per cent of the farms were mortgaged, but the number encumbered has been greatly reduced, even under the prevailing rather unsystematic production of grain and live stock. In the hope of further bettering their condition most of the farmers have taken up the growing of apples, the success of which remains to be seen.

At present, owing to a few years of failures, the setting of orchards has been discontinued, and the industry hangs in the balance. A few good crops would serve to increase the already large acreage in orchards and to establish it firmly in this part of the State, while a few more failures would probably cause many of the present orchards to be neglected and the lands put to other uses.

Whatever doubt there may be as to the adaptability of the soil and climate of Webster County to the production of apples, there is none whatever as to the opportunity for profitable stock raising. The short mild winters, the shelter of timber and draws, the suitable soils for the production of corn, forage, and grasses of all kinds, and the abundant supply of living water all combine to make this an ideal region for raising farm animals. There seems to be no reason why the average farmer should not find this branch of agriculture a source of certain income from year to year, with the returns greater in the end than in the case of fruit growing. It is doubtful whether the average farmer can afford to give up his best farming land to orchards, or to give his orchards sufficient time and attention to insure the best success, and he will find stock raising, which is more easily within his reach, an industry to which his farm is equally well if not better adapted. Those who have ample land, however, will doubtless find that, by ordinary care, the rougher ridges and stony slopes less suited to cultivation will, if planted to orchards, yield an occasional profitable crop of fruit, which can be handled without interfering with the general farming operations.

The price of land varies from \$6 to \$50 per acre, depending on the character of the soil, state of improvements, and distance from town.

From \$9 to \$14 an acre is about the average price of farm land partly under cultivation and with ordinary improvements. While, owing to the cheapness of land in general, there are some very large tracts, the average farm contains only about 105 acres. Of the whole number of farms 35 in every 100 are rented, the remainder being operated by the owners and the members of their families. The farmers expend little for labor, and where it becomes necessary to hire there is no such difficulty in securing help as is experienced in many other States or in other parts of Missouri.

Corn, wheat, and hay are the principal farm crops, ranking in importance in the order named. The average yield per acre of corn is about 20 bushels, of wheat about 10 bushels, and of hay from 1 to 1½ tons. Oats are not grown extensively, but from 20 to 25 bushels per acre is a fair average yield. Potatoes yield from 50 to 90 bushels per acre, depending upon the season and the type of soil. While there is a large acreage in orchard in the county, many of the trees have not reached the bearing age and the production is comparatively small. There are four creameries in the county, which, together with several private dairies, are estimated to produce from \$100,000 to \$125,000 worth of butter and cream annually. Conditions are especially favorable for the profitable development of this industry. With the exception of the one matter of shipping facilities, most excellent locations for dairy farms are available throughout the greater part of the county, and there is probably no branch of agriculture that will prove a more paying investment for the area than this one.

The growing of tomatoes for canning purposes has been introduced lately and is rapidly assuming importance as an industry. The soils are well suited to this crop, producing tomatoes of large size and excellent quality, while the lateness of frosts in the fall in this section permits them to grow and ripen through a much longer period than in more northern areas. There are four canning factories in the county at present, and through the influence of their promoters the farmers have been convinced of the profits in growing this crop. With the limited experience of the growers, and on the various soils, irrespective of special adaptation, the average yield for this year was 72 bushels per acre, which, at 40 cents a hundred pounds, gave a gross return of \$16.39 per acre. A yield of 21,000 pounds per acre has been grown on bottom lands along the small streams and creeks, which at the above price would yield \$84. By proper fertilization and more intensive methods this yield should be almost equaled on the uplands.

The soils of Webster County, while producing a great variety of crops, are specially adapted to certain crops. The Clarksville stony loam is best suited to fruit, more especially apples, peaches, pears, and

other tree fruits, but when newly broken yields of corn as high as 50 bushels have been produced. The Clarksville silt loam is better suited to wheat, grass, and clover, although by methods suggested under the discussion of this type it can be made a corn soil of some merit. The Clarksville loam is more especially adapted to corn, grass, tomatoes, and small fruits.

The main line of the St. Louis and San Francisco Railroad passes diagonally across the northern part of the county, and the Kansas City, Fort Scott and Memphis branch of the same system traverses the southern part in an easterly and westerly direction. These roads afford about eight principal shipping points within comparatively easy reach of all sections. Over these lines much of the produce of the county is shipped direct to Kansas City and St. Louis. The fruit often goes to the far eastern markets.

The wagon roads of the county, besides being hilly, are very poor during the late winter and spring seasons, especially on the flat upland ridges. The roads do not follow the section lines to any great extent, but follow the ridges or the bottoms of draws instead. There is much need of road improvement in all parts of the county, but so far little has been done in this direction, although an abundant supply of the finest material is at hand.

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