

SOIL SURVEY OF JESSAMINE COUNTY, KENTUCKY.

By RISDEN T. ALLEN.—Area Inspected by HUGH H. BENNETT.

DESCRIPTION OF THE AREA.

Jessamine County is situated in the east-central part of Kentucky. It is bounded on the north by Fayette County, on the east by Fayette and Madison Counties, on the south by Madison and Garrard Counties, and on the west by Mercer and Woodford Counties. It has an area of 172 square miles, or 110,080 acres.

Jessamine County lies largely in the Lexington peneplain, popularly known as the "bluegrass region." The surface of a greater

part of the area, that north and northwest of Hickman Creek, is predominantly gently rolling, with the exception of comparatively narrow strips along Hickman Creek and the Kentucky River, where much of the land is very steep. Southeast of Hickman Creek the country is decidedly hilly, with steep slopes, only small areas on the ridge crests and hilltops being level. A large part of the land in this section, however, is cultivated; the gentle slopes do not erode to any extent, but many steep slopes used for clean-cultivated crops are subject to severe erosion, which in some cases removes the soil cover, exposing the bedrock. In the region northwest of Hickman Creek almost all the land is safely and easily cultivated, owing to the smooth topography, the exception being the occasional steep slopes along the drainage ways where bedrock lies near the surface.

The general elevation of Jessamine County ranges from about 800 to 900 feet, with only a few points reaching an elevation of 1,000 feet above tide. The Kentucky River, forming the southern boundary of the county, flows through a narrow, deeply eroded valley whose sides are prominent bluffs and precipitous cliffs from 200 to 300 feet high. The county is drained by tributaries of the Kentucky River, practically all of which flow in a southerly or westerly direction.

The first settlements in the region now included within the limits of Jessamine County were made in the period between 1770 and 1775,



FIG. 39.—Sketch map showing location of the Jessamine County area, Kentucky.

following an expedition led by Daniel Boone, from North Carolina. Immigration increased rapidly after the close of the Revolutionary War, the settlers coming mainly from North Carolina and Virginia. The present population is largely composed of the descendants of these early pioneers, there being very few foreigners in the county. In recent years a few settlers have moved in from Ohio, Illinois, Indiana, and other Northern States. There are some negroes in the southern part of the county, but they constitute a small part of the population. The population of the county in 1910 was 12,613, of which approximately 3,000 was urban.

Nicholasville, the county seat and chief town, is located in the central part of the county, on the main line of the Cincinnati, New Orleans & Texas Pacific Railway and a branch line of the Louisville & Nashville Railroad. It is also connected with the city of Lexington by an electric line. It has a population, according to the 1910 census, of 2,935. Wilmore is the town of next importance, with a population of about 700. Other small villages are Keene, High Bridge, Brannon, and Camp Nelson.

The Louisville & Nashville Railroad enters the county from the northwest, extending southeastward through Nicholasville. It affords freight and passenger service to Louisville, Cincinnati, and other points to the north and south. The Cincinnati, New Orleans & Texas Pacific Railway also enters the county from the north, extending southward through Nicholasville, and thence southwestward out of the county. It furnishes good passenger and freight service to northern points and to distant southern markets. An electric railway, furnishing passenger and freight service, connects Nicholasville with local markets. Government locks have been built at several places on the Kentucky River and this stream is navigable the year round.

The county is well supplied with good public roads. Some of them in the southern part along the stream courses are rough, rocky, and hilly, but pikes surfaced with limestone reach all parts of the county. Jessamine County is said to have more macadamized roads in proportion to its size than any other county in the State.

CLIMATE.

There is no Weather Bureau station within Jessamine County, but data which represent fairly the local climatic conditions are obtainable from the station at Lexington, Fayette County, about 12 miles from Nicholasville. The mean annual temperature is about 55° F. The highest temperature recorded at Lexington is 102°, and the lowest -20° F. For the winter months of December, January, and February the temperature averages 34.6°

Extreme cold spells occur in the winter, but as a rule these are of short duration. The total snowfall for these months averages 13.5 inches, and it is not uncommon to have light falls in the early spring months. The summers usually are very pleasant, with few very warm days. The summer temperature averages 74.4°. For the spring months the temperature averages about 54°, and for the fall months about 57° F.

The rainfall is usually sufficient for all crops, and is well distributed throughout the year. The mean annual precipitation is about 44 inches. The total rainfall for the driest year recorded at Lexington is 28.72 inches, and for the wettest year 61.36 inches.

The average date of the last killing frost in the spring, according to the Lexington records, is April 19, and of the first in the fall, October 23, while the earliest frost in the fall occurred on September 30, and the latest in the spring on May 20. The growing season usually is sufficiently long for the maturing of all ordinary crops. It averages 187 days.

The following table, compiled from the records of the Lexington station, gives statistics of temperature and precipitation in detail:

Normal monthly, seasonal, and annual temperature and precipitation at Lexington.

Month.	Temperature.			Precipitation.			
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year (1904).	Total amount for the wettest year (1890).	Snow, average depth.
	° F.	° F.	° F.	Inches.	Inches.	Inches.	Inches.
December	36.7	71	- 8	3.73	3.10	4.05	3.7
January	33.5	72	-12	4.06	1.92	5.34	4.6
February	33.7	72	-20	3.60	2.38	8.13	5.2
Winter	34.6	72	-20	11.39	7.40	17.52	13.5
March	43.8	83	- 1	4.60	4.75	9.91	4.7
April	53.4	88	15	3.73	3.08	3.59	0.7
May	64.1	92	30	3.76	2.60	4.71	0.5
Spring	53.8	92	- 1	12.09	10.43	18.21	5.9
June	72.9	98	42	3.96	2.51	7.43	0
July	76.0	102	51	4.21	3.13	3.14	0
August	74.4	99	51	3.65	2.44	7.32	0
Summer	74.4	102	42	11.82	8.08	17.89	0
September	69.4	98	32	2.91	1.71	1.82	0
October	56.3	88	21	2.16	0.57	2.38	T.
November	44.2	78	2	3.44	0.53	3.54	1.4
Fall	56.6	98	2	8.51	2.81	7.74	1.4
Year	54.9	102	-20	43.81	28.72	61.36	20.8

AGRICULTURE.

Jessamine County was settled by a farming population, who at first engaged in the production of home supplies, growing chiefly corn and small grains and raising cattle and hogs. Tobacco became an important crop at a comparatively early date.

Hemp, which is still grown to some extent, was one of the early products. In general with other sections of the Blugrass region the raising of blooded horses received much attention. The dominant type of agriculture, however, has been general farming rather than the production of special crops or of live stock.

The 1880 census reports 16,692 acres in wheat and 15,816 acres in corn. Compared with these, other crops occupied small acreages, 1,688 acres being devoted to oats, 1,023 acres to barley, and 2,033 acres to hay. In 1890 a total of 17,585 acres is reported in wheat and 14,748 acres in corn, with 3,012 acres in oats and only about 300 acres in barley, while rye was grown on 822 acres and tobacco on 1,348 acres. Hay was cut from 6,120 acres in 1889. By 1900 the area in wheat had increased to 24,024 acres, corn remained about stationary, with about 16,000 acres, oats were grown on about 800 acres, and but little rye and barley was produced. Hay occupied about 5,000 and tobacco 1,886 acres.

The 1910 census reports wheat on 18,682 acres and corn on 17,209 acres, with oats on a total of 1,429 acres. But little rye and barley is reported; tobacco was produced on 3,382 acres, and hay was cut from about 12,000 acres. There were nearly 17,000 apple trees and about 5,000 peach trees in the county. The same census gives the number of cattle slaughtered or sold as 3,442 and of calves 800. The production of hogs was 17,000 and of sheep and goats 7,000. There were 2,611 dairy cows, 1,069 other cows, and 946 yearling heifers. The total value of live stock in the county was \$900,457.

These figures of crop production show that for a considerable period wheat and corn have been the leading agricultural products, occupying the greater part of the land under cultivation. The area devoted to hay and tobacco has been much smaller, yet these have long been important crops. While some hay is sold, the hay crop in addition has an important place in rotations. The acreage devoted to hay has increased considerably during the last 5 years. Wheat and corn are grown as money crops, some of the latter being used with a relatively small production of oats for the maintenance of work stock and other stock on the farm.

Hemp is grown in small areas on a number of farms as a money crop. Orchard products, principally apples, a few grapes, strawberries, brambleberries, sorghum, rye, barley, and potatoes and other vegetables are reported by the census, but all these crops occupy a rather insignificant acreage.

It is thus seen that the agriculture of Jessamine County consists of general farming, including the production of the cereals, chiefly wheat and corn, hay, and tobacco, mainly as market crops. There is no very important interest in the live-stock industries and dairying.

No attention is given to the adaptation of the various soils to the different crops grown, largely because there is but little variation in the soils of the county. The predominating soil, the Hagerstown silt loam, with its shallow phase, comprises 77.9 per cent of the total area. On the slopes, which in the aggregate constitute a fairly important acreage, there is a persistent tendency to grow intertilled crops, notwithstanding the fact that serious erosion usually follows such use. However, aside from this improper use of sloping land and the failure to develop the live-stock and dairy industries on soils particularly suited to them, the soils are used in close accordance with their adaptation. Other crops are known to give good results on similar soils in other localities, and it would seem that these might be introduced in this county to advantage. For example, soy beans, cowpeas, and alfalfa are grown successfully on the Hagerstown silt loam in various parts of the country, yet these crops are of relatively little importance here.

Modern farm machinery, such as riding cultivators, harrows, grain drills, and other labor-saving contrivances, are in general use. The farm buildings are rather small but entirely adequate usually for the housing of products and animals. A good many farms have barns of considerable size for the handling of tobacco, and all fields are well fenced.

In general, it may be said that the soil is handled in a fairly efficient manner. Preparation of the seed bed is deep and thorough and frequent shallow cultivation is employed. Land is usually broken in the fall to a fairly satisfactory depth. The prevailing methods are such that the yields of corn, small grains, grass, and tobacco are maintained without the extensive use of fertilizers. The rather small supply of barnyard manure available is applied to the fields, and rotations, including leguminous crops, chiefly red clover, are in general use. In some cases it may be possible to increase the yield of crops by deeper plowing and by the use of such materials as ground limestone or ground phosphate rock or other carriers of phosphorus. It is recognized by the farmers that the soils are well adapted to grasses, such as bluegrass and timothy, and to such forage crops as clover, cowpeas, soy beans, and sorghum, and that local conditions are favorable for the raising of hogs, beef cattle, and sheep and for dairying, and it seems that these crops and industries should receive greater attention.

It is sometimes difficult to obtain farm labor when most needed. Most of the laborers are employed by the day at wages ranging from \$1 to \$2.50. Where employed by the month the wage ranges from \$15 to \$25 per month, with board.

According to the 1910 census, the average size of the farms in Jessamine County is 77.7 acres. There are only a few farms which contain more than 1,000 acres; the larger farms as a rule range from 100 to 300 acres. About 91 per cent of the area of the county is reported in farms, and of the land in farms 76 per cent is improved.

There has been a slow but gradual decrease in the number of farms operated by the owners, until at present probably 60 per cent is a fair estimate, the remaining 40 per cent being operated by tenants. There are a number of leasing systems in use in the county, the most popular being based on the share plan. Under this system the landlord furnishes tools, horses, and everything necessary to produce the crops, directs the cultivation and selects the crops to be grown, and receives a certain share of the proceeds. Where the tenant furnishes tools and horses he receives one-half of the money crop. In this case the acreage devoted to the market crops is agreed upon by tenant and landlord. Where cash rent is paid it ranges from about \$1 to \$8 an acre.

The value of land depends upon its character and location. The rough, hilly country along the Kentucky River away from roads can be bought for \$30 to \$50 an acre, while nearer the roads the price ranges upward to \$75 and \$100. In the more nearly level and gently rolling areas of the Hagerstown silt loam farm land is held at prices ranging from \$100 to \$300 an acre, depending upon the improvements and location with respect to transportation facilities. Such valuable lands necessitate intensive methods and crops of high acreage value.

SOILS.

The upland soils of Jessamine County, comprising about 95 per cent of the area, are residual from limestone, except in some comparatively small areas in the southwestern section where they are derived from sandstone. The limestone is mainly a pure, hard, bluish limestone, but in places some of the beds are somewhat argillaceous.

The soil material represents the residual products left upon the decay of the limestone—such products being formed of the impurities remaining after the solution and removal of the lime carbonate which originally composed the greater part of the rock. Many feet of limestone have weathered to form a single foot of soil. The resultant soil material shows little relation to the lithologic character of the parent rock; it consists mainly of siliceous and argillaceous material not especially calcareous, whereas the rocks are highly calcareous. The material derived from sandstone in the south-

western part of the county, the areas of which are not mapped separately on account of their small size and the mixture of material from the associated limestone, is probably much more closely related, in lithologic nature, to the parent rock than that derived from the limestone. Where the limestone is argillaceous in part distinct soils (Colbert and Fairmount) are developed which differ considerably in color and structure and probably in mineralogical character from soils derived from the pure limestone, i. e., the Hagerstown soils.

Since the decay of the rocks the material has been altered somewhat by vegetation and by varying conditions of drainage. Where the drainage has been good oxidation has affected the color of the material, causing the subsoil to be a deeper red; where the drainage has been less thorough, as in the wet depressions, drab and yellowish colors exist in the material.

The depth of the soil material varies usually with the gradient of slopes. Over the smoother areas the material ranges in depth from about 4 to 10 feet or more, while on the steeper slopes it is frequently less than 1 foot in depth, with many exposures of the bedrock. There is no important relationship between the soils and the physiography, except that between the residual soils and the uplands and that between the alluvial soils and the stream bottoms, further than that the soils occurring on the steeper slopes are shallower and more stony. The residual limestone material is distributed throughout the uplands of the county. The rough and steeply sloping Colbert and Fairmount soils predominate in the rougher country in the southeastern part of the county, but this fact is due to the presence of a peculiar type of rock, the topography being rough and irregular apparently because the material derived from the rock is peculiarly subject to erosion, and because stream dissection has advanced farther in this part of the county. The upland soils are predominantly silty in the surface portion and have clay subsoils.

The alluvial soils consist of material washed from the upland soils of the county and from those soils occurring in the drainage basins of the streams rising outside the area, as in the case of the Kentucky River. They are composed largely of transported or stream-deposited material washed from residual limestone soils. They are being added to by each overflow, additional sediments being laid down over the flood plains. The alluvial soils are well drained between overflows; they are decidedly brownish in color and there is comparatively little drab and yellowish mottling in the subsoil.

Seven soil types, representing five soil series, and Rough stony land are mapped in Jessamine County.

The Hagerstown soils, derived from limestone, are prevailingly brown in color in the surface portion and yellowish brown to reddish brown in the subsoils. They are well drained and friable, and the

structure is favorable to the free internal movement of air and moisture.

The Colbert and Fairmount soils, on the other hand, are grayish to light brown at the surface, with yellow and plastic subsoils. They have good surface drainage on account of the sloping surface, but the compact, stiff clay subsoil prevents, to a considerable degree, the internal movement of moisture and air. The material of the Colbert and Fairmount series is also residual from limestone, but the rock appears, at least in places, to be more argillaceous than that giving rise to the Hagerstown series.

The soils of the Guthrie series are light brown, gray, light gray, mottled gray, and yellow or brown to almost white in color, and overlie subsoils ranging from pale yellow to bluish gray with more or less mottling. Both the color and the extent of the mottling have been largely determined by the drainage, the yellow color, with a minimum of mottling, occurring in the better drained areas, and the bluish color, usually with abundant mottling, being characteristic of the more imperfectly drained areas. In areas showing the mottled subsoils dark-colored ferruginous concretions are usually found, their quantity being in inverse ratio to the thoroughness of drainage. The series is thus distinguished mainly by characteristics resulting from imperfect drainage. It is derived from limestone material, and occurs in flat or depressed areas.

The Huntington series includes types with brown surface soils and yellowish-brown to light-brown subsoils. Only one member of the series, the silt loam, is found in Jessamine County. It occurs in the first bottoms of streams and is subject to overflow. Between overflows the drainage is good, and moisture and air circulate freely through both soil and subsoil. The material consists wholly or chiefly of wash from the limestone soils of the uplands.

The following table gives the name and actual and relative extent of each soil type mapped in Jessamine County:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Hagerstown silt loam.....	60,416	77.3	Rough stony land.....	2,816	2.6
Shallow phase.....	24,704		Hagerstown clay loam.....	512	.5
Fairmount stony clay.....	8,576	7.8	Guthrie silty clay loam.....	384	.3
Colbert silt loam.....	6,784	6.2	Total.....	110,080
Huntington silt loam.....	5,888	5.3			

HAGERSTOWN SILT LOAM.

The Hagerstown silt loam is a brown, mellow silt loam, grading at about 8 to 15 inches into lighter brown silty clay loam, which in turn passes within a few inches into reddish-brown, moderately

friable clay. This clay usually becomes more reddish with increase in depth, the lower subsoil being dull red in color, particularly in the higher situations. In many places on the lower slopes and in more nearly level areas the upper subsoil is yellowish brown and the lower subsoil reddish brown or yellowish red. In some of the depressions, where frequently the brown silt loam soil is 18 to 24 inches deep, the subsoil is yellowish brown throughout the 3-foot section. A common feature of the subsoil is the presence of small, round, black and brownish concretions, probably of ferruginous character. These are not larger than red-clover seed. When dry the surface has a compact structure, especially in fields of grass and stubble. With proper cultivation and maintenance of the supply of organic matter the soil has a good tilth. Moderately heavy teams and cultural implements are needed to effect good tillage in a deep, mellow soil of this kind.

There are several included patches of Fairmount clay, a yellow, stiff, heavy clay, which, although much less productive than the Hagerstown, are not mapped separately, as they are very small and unimportant.

The Hagerstown silt loam occupies practically all the uplands on the northwest side of Hickman Creek. Some of the steeper slopes are mapped as a shallow phase of this type. The topography of the typical soil is moderately to gently rolling, favorable usually to the use of all farm implements. There are a few slopes sufficiently steep to be injured by washing where intertilled crops are grown, and the larger of these are indicated on the map as a shallow phase of the type.

Surface drainage and the internal drainage of the Hagerstown silt loam are good. The type is retentive of moisture, and crops rarely suffer from drought, especially where the land is properly cultivated. Fields can be plowed safely within two days after a soaking rain, except in some of the more nearly level areas where the run-off is less rapid.

This is the most important soil in the county, occupying about four-fifths of the total upland area. It is important both on account of its large extent and for its high productive value. Probably 90 per cent of the type is cultivated.

The most important crops grown, named in the order of acreage, are wheat, corn, hay (grass and clover), and tobacco. The acreage devoted to wheat and corn is nearly equal, while the area devoted to grass and clover is nearly one-half that used for corn. Tobacco occupies a small acreage, but is an important money crop. Among the other crops grown are hemp, oats, rye, Irish potatoes, apples, and several kinds of vegetables; but the area devoted to these is small, and they are crops of relatively little commercial importance. The

wheat, tobacco, and hemp are all sold from the farm, and also some of the corn and hay, but probably the larger part of the last two is used on the farm for the work stock and the few cattle and hogs raised.

The farm animals of most importance are the work stock and dairy cows, the latter kept on most farms for the production of milk for home use, and here and there for shipment. Very few beef cattle are raised on the type.

As ascertained from the farmers on this soil, and according to observations made in the field, the yield of wheat ranges from about 15 to 40 bushels per acre, corn 25 to 60 bushels, oats about 40 bushels, timothy 1 ton to 2½ tons, clover 1 to 2 tons, and tobacco from about 800 to 1,800 pounds.

This soil is generally tilled in an efficient way. Rotations are practiced on most farms, and these keep up the supply of organic matter. Heavy plows and teams are used in breaking the land, three or four horses to the plow commonly being used. In the fall breaking of the land, and in the preparation of the seed bed generally the fields are plowed to a depth of 6 or 8 inches. After plowing the soil generally is harrowed thoroughly. In the subsequent cultivation of crops lighter implements are used. The farm buildings are adequate for the system of farming carried on. Large barns are not needed, as dairying and live-stock raising are not important industries.

The present value of the Hagerstown silt loam varies from about \$75 to \$300 an acre, depending on the location of the land, the farm buildings, and the general condition of the soil as affected by past treatment.

Owing to the adaptation of this soil to grasses, especially bluegrass, and to forage crops, such as cowpeas, soy beans, and clover, there is no apparent reason why the raising of beef cattle and hogs and dairying should not be developed as important industries. Railway transportation facilities are good, and large markets are within easy reach. The soil is well suited to grazing, becoming compact from the trampling of stock only where too closely grazed. By changing stock from one pasture to another at intervals and returning the land to cultivation there would probably be little trouble from this source. Dairying could be practiced on an intensive plan—that is, where the cows are maintained largely by feeding—inasmuch as large yields of excellent forage can easily be produced, or it could depend more largely on pasturing on the fine bluegrass sods. The increased supply of manure resulting from an increased production of forage crops and their use on the farm would keep the soil in a high state of productiveness.

The Kentucky experiment station, after making thorough chemical analyses and field tests of the Hagerstown silt loam in Jessamine County, recommends a fertilizer mixture for tobacco consisting of 100 pounds of sulphate of potash, 50 pounds nitrate of soda, and 100 pounds of dried blood per acre, to be spread broadcast and harrowed in or drilled in before the tobacco is planted. If cottonseed meal is used instead of dried blood, twice the quantity is recommended, the mixture consisting of 100 pounds sulphate of potash, 50 pounds nitrate of soda, and 200 pounds cottonseed meal.

Hagerstown silt loam, shallow phase.—This phase represents sloping areas of Hagerstown silt loam, occurring on the steeper slopes along and near drainage ways. The predominating material is similar to that of the typical Hagerstown silt loam, but the soil usually is shallower, and bedrock commonly is encountered within a depth of 3 feet. The surface soil is about 5 to 10 inches deep. The phase as mapped includes patches of Hagerstown clay loam, an occasional small area of clay, and a number of areas of very shallow soil in which the limestone frequently outcrops and where fragments of limestone are scattered over the surface.

This phase is distributed throughout areas of the Hagerstown silt loam. The slopes are, in many places, steep enough to cause some washing under cultivation, as the run-off is rapid. More than one-half the phase is cultivated, largely to small grains, corn, and grass, with some tobacco. A large part of it is used for hay and pasture land. The forested portion supports a growth of locust, oak, hickory, and walnut.

Owing to its uneven topography, this land is best suited for pastures and the growing of soil-binding crops, such as the grasses and grains. Clean-cultivated crops generally increase washing, and, as a rule, should not be grown or at least not for more than one year at a time.

HAGERSTOWN CLAY LOAM.

The Hagerstown clay loam is a reddish-brown clay loam, underlain at about 3 to 5 inches by brittle clay, usually containing some fragments of limestone. In places the soil is a silty clay loam.

This type occurs on slopes where erosion has prevented the formation of or has removed any silt loam surface soil, such as that of the Hagerstown silt loam, that formerly may have been present. It is a well-drained soil, which has a very compact structure in dry weather, unless thoroughly tilled.

The Hagerstown clay loam is inextensive and is confined to narrow strips along Hickman Creek, and one area at Troy on the Woodford County line. It is mainly under cultivation, being used for

tobacco, small grains, corn, grass, and clover. The yields are good where the soil is plowed deeply and thoroughly and where rotations are practiced to maintain a good supply of organic matter. The best use of this type, on account of its steep slope and susceptibility to severe washing, is for soil-binding crops. Heavy plows and teams are necessary to till this heavy soil efficiently.

COLBERT SILT LOAM.

The typical Colbert silt loam is a light-brown silt loam, grading at 5 to 8 inches into yellowish silty clay loam, which quickly passes into yellow or yellowish-brown, stiff, plastic clay. In places, especially on the gentler slopes where colluvial material has accumulated, the surface soil is a deeper brown and the depth to clay is greater. On the other hand, there are included steeper slopes where the clay is near the surface. Some included areas have a yellow or brownish-yellow, moderately friable clay subsoil, the material apparently having been influenced by material from the beds of sandstone which are locally found with the limestone contributing the bulk of the material. It is not practicable to separate these areas. There are also some included stony patches which are not separated, on account of their small size.

This type occurs in the southeastern part of the county, on the crests and upper slopes of the hills and ridges. Although this is a hilly region, the surface of this high-lying type is nearly level to only moderately steep. But little of it is too steep for cultivation. The drainage is very good, and the soil holds moisture well under proper tillage.

In dry seasons the soil hardens, unless it has been deeply plowed and kept well supplied with vegetable matter, and crops sometimes suffer from lack of moisture. The soil does not appear to be so retentive of moisture as the Hagerstown silt loam.

This type is fairly extensive, and probably more than 75 per cent of it is under cultivation. The same crops are grown as on the Hagerstown silt loam, and their relative importance is about the same. Stock raising and dairying are of little importance. Wheat and tobacco are sold. Some of the corn and hay also is sold, but the greater part is used to feed the work stock and the few cattle and hogs raised. The yields are not so heavy as on the Hagerstown silt loam. They range from fair to good, according to the management of the soil.

A lighter equipment of work stock and implements is used on this type than on the Hagerstown silt loam. However, preparation and cultivation of the land is generally done with a fair degree of efficiency and the better farmers employ some system of crop rotation,

including clover and grass, wheat, corn, and tobacco. Little fertilizer is used, but the comparatively small supply of barnyard manure available is applied to the fields.

The value of the Colbert silt loam, which depends largely on the topography, ranges from about \$40 to \$125 an acre.

The live-stock industries, particularly the raising of beef cattle, offer good opportunities on this type. There is a general need for the more extensive use of legumes in crop rotations.

FAIRMOUNT STONY CLAY.

The Fairmount stony clay consists of a yellowish-brown to brown clay which passes at about 2 to 4 inches into a yellow, plastic, heavy clay, becoming sticky and pale yellow with increasing depth. Bed-rock of limestone usually is encountered at about 6 to 24 inches. Large and small fragments of limestone are plentiful on the surface and through the soil section, and limestone outcrops are of frequent occurrence.

This soil occurs along Hickman Creek and in the section to the southeast and also in the western part of the county. It occupies the steep slopes and tops of comparatively high hills, and is well drained. The surface run-off is so rapid, on account of the steep slope, that cultivated areas wash badly.

This type is of little importance in the county. About 25 per cent of it is cultivated, the remainder being used for woodlots and for pasture. The forest growth consists mainly of cedar, locust, red bud, and hickory, with some walnut, oak, and elm and considerable buckbrush.

Corn is the principal crop. It is grown for market to some extent and for use on the farm. Some wheat and hay are produced, the former for market and the latter mainly for feed for work stock and beef cattle. The type affords fine pasturage, and the raising of beef cattle is practiced to a greater extent than on the soils already described. Crop yields generally are low, except on land recently cleared, from which fair yields of corn and clover are obtained.

This land is cultivated with implements similar to those used on the Colbert silt loam, and tillage accordingly is somewhat inefficient, since the heavy clay soil requires heavy tools and teams for the preparation of a deep seed bed. Under the present methods of handling this soil severe erosion results where intertilled crops are grown, and many of the slopes are covered with only a thin veneer of soil consisting of a tough, heavy clay which bakes and cracks on drying and clods badly when plowed. As a result of this erosion a large number of fields on steep slopes have been abandoned to the natural vegetation, and others can be successfully used only for

grass crops and pastures. The value of this land is considerably lower than that of the Colbert silt loam.

The type is best suited for use as pastures and woodlots or for the production of grass and clover crops. It is not a soil that can be successfully used for any long period of time for crops other than those which protect the soil from washing. It is believed the raising of sheep and beef cattle could be profitably extended over areas of this soil not at present fully developed.

GUTHRIE SILTY CLAY LOAM.

The typical Guthrie silty clay loam is a mottled drab and yellowish-brown or rusty-brown silty clay loam, which grades into mottled drab and yellowish, plastic clay. In places the soil has more of a brownish color or is light brown mottled with drab or bluish gray, the last becoming more prominent with increase in depth. In some places the lower subsoil is dark blue. The surface dries out to a light-grayish color.

This type occurs in several small areas in the northern part of the county, some of which are too small to map on the scale used. It occupies flat bottoms and depressions and its drainage is very poor.

This type is of little importance, either in extent or in agricultural value. It is not cultivated and is mainly forested, the timber consisting principally of ash and oak. The type is used to some extent for pasture. In other parts of the State this soil, after being drained, is used for wheat. It is probably best suited to the production of wheat, redtop, alsike, and lespedeza.

HUNTINGTON SILT LOAM.

The typical Huntington silt loam is a brown, mellow silt loam, which passes at about 15 to 24 inches into lighter brown silty clay loam or silty clay. In places the lower subsoil contains considerable black concretions and concretionary material.

The type occurs as narrow strips in the stream bottoms throughout the county, the largest areas being those along the Kentucky River and Hickman Creek. It usually has a level surface, and the greater part of it is subject to overflow. Its drainage between the periods of overflow is good, both soil and subsoil being sufficiently permeable for the free circulation of moisture and air.

The area of the Huntington silt loam is relatively small. The type is used mainly for pasture land and for the production of corn. It is used to some extent in growing the small grains and hemp, the latter mainly for the seed. Corn gives good yields, and the grasses do well.

This soil is easy to cultivate, and tillage generally is efficient. It is a highly productive soil, and is enriched at intervals by the deposition of material from overflows.

Although of limited extent, the Huntington silt loam has an important influence on the value of the associated Colbert and Fairmount soils in the southeastern part of the county, usually being sold in conjunction with those soils. Some of the areas could be improved by ditching or tiling. The methods employed and crops grown seem to be very well suited to the type.

ROUGH STONY LAND.

The areas mapped as Rough stony land include stony slopes, with outcrops of limestone occurring in such abundance as to preclude cultivation. Some of these slopes are forested, but there is considerable precipitous rock outcrop. The areas mapped occur as narrow strips, mainly along the Kentucky River. Land of this kind is of no agricultural value.

SUMMARY.

Jessamine County is situated in the east-central part of the State of Kentucky, within the section known as the Bluegrass region. It has an area of 172 square miles, or 110,080 acres. In the southwestern part the county is hilly and broken, while the northern section is predominantly gently rolling. The elevation ranges from about 800 to 1,000 feet above sea level.

In general the county is well drained. The Kentucky River, forming the southern boundary, receives practically all the drainage of the county.

Jessamine County was first settled about 1770 or 1775. In the 1910 census the population of the county is reported as 12,613. Nicholasville, the county seat and chief town, with a population of about 3,000, is situated in the central part of the county. There are a number of small villages, the most important of which are Wilmore and Keene. The urban population is about 3,000.

Good railway transportation is furnished by the Cincinnati, New Orleans & Texas Pacific Railway and the Louisville & Nashville Railroad. An interurban line connects Nicholasville with Lexington. The county is well supplied with good public roads.

The climate is mild. The mean annual temperature is about 55° F. The rainfall, averaging about 44 inches annually, is well distributed throughout the year and is adequate for successful crop production. The growing season averages 187 days.

Farming has been the chief industry since the early settlement of the county. Wheat and corn long have been the principal crops; hay

and tobacco also are important crops. While some of the corn and hay is sold, a part is used for feed for work stock and the few beef cattle, dairy cows, and hogs in the county. Wheat is mainly a money crop. Practically all of the county is in a high state of cultivation.

The upland soils of the county, comprising 95 per cent of its total area, are residual from limestone and are classed with four series—the Hagerstown, Colbert, Fairmount, and Guthrie.

The Hagerstown series is represented in the county by two members, the silt loam, with a shallow phase, and the clay loam. The first named is the most important soil mapped, occupying nearly four-fifths of the area of the county. It is particularly well suited to the production of wheat, corn, hay (grass and clover), tobacco, and hemp. Improved farm machinery can be used on all parts of the type except in the areas of the shallow phase. The clay loam type is adapted to all the crops grown on the silt loam and is perhaps slightly better suited to the production of grains.

The Colbert series is represented by one type, the silt loam. It has about the same agricultural value as the Hagerstown silt loam; wheat, corn, grass, clover, and tobacco are the principal crops. In general the use of modern farm machinery is not practicable, owing to its occurrence on slopes and ridge crests.

The Fairmount stony clay is best suited to stock raising and dairying, although at present corn, wheat, and other clean-cultivated crops are grown. Owing to its rough topography, it is subject to erosion and should be seeded to grasses and soil-binding crops.

The Guthrie series is represented by only one member, the silty clay loam. On account of its depressed surface and consequent poor drainage, it is not cultivated. With proper drainage it is adapted to grasses, corn, and small grains.

Only one alluvial soil is mapped, the Huntington silt loam. The better drained areas of this type are well suited to corn, hemp, and grass.

Rough stony land comprises stony slopes and rock outcrop and has no agricultural value.

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