



U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

IN COOPERATION WITH THE STATE OF MISSISSIPPI, EARL BREWER, GOVERNOR;  
E. N. LOWE, DIRECTOR, MISSISSIPPI GEOLOGICAL SURVEY.

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SOIL SURVEY OF CHICKASAW COUNTY,  
MISSISSIPPI.

BY

E. M. JONES, OF THE MISSISSIPPI GEOLOGICAL SURVEY,  
IN CHARGE, AND C. S. WALDROP, OF THE U. S.  
DEPARTMENT OF AGRICULTURE.

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HUGH H. BENNETT, INSPECTOR, SOUTHERN DIVISION.

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[Advance Sheets—Field Operations of the Bureau of Soils, 1915.]



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1917.

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## LETTER OF TRANSMITTAL.

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U. S. DEPARTMENT OF AGRICULTURE,  
BUREAU OF SOILS,  
*Washington, D. C., May 6, 1916.*

SIR: Under the cooperative agreement with the State of Mississippi, a soil survey of Chickasaw County was carried to completion during the field season of 1915.

I have the honor to transmit herewith the manuscript and map covering this work and to recommend their publication as advance sheets of Field Operations of the Bureau of Soils for 1915, as authorized by law.

Respectfully,

MILTON WHITNEY,  
*Chief of Bureau.*

Hon. D. F. HOUSTON,  
*Secretary of Agriculture.*

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## MAP.

Soil map, Chickasaw County sheet, Mississippi.



# SOIL SURVEY OF CHICKASAW COUNTY, MISSISSIPPI.

By E. M. JONES, of the Mississippi Geological Survey, In Charge, and C. S. WALDROP, of the U. S. Department of Agriculture.—Area inspected by HUGH H. BENNETT.

## DESCRIPTION OF THE AREA.

Chickasaw County, Miss., is situated in the northeastern part of the State, approximately 64 miles south of the Tennessee State line and 28 miles west of the Alabama State line. It is bounded on the north by Pontotoc and Lee Counties, on the east by Monroe County, on the south by Clay and Webster Counties, and on the west by Calhoun County.

The greatest width of the county from north to south is about 23 miles; its average length from east to west is about 24 miles. It has an area of 501 square miles, or 320,640 acres. The base map used in mapping the soils was constructed in the field with the planetable as the soil survey progressed.

The surface of the county ranges from level or undulating to hilly. There are three distinct topographic divisions: The level flatwoods on the west; the higher Pontotoc Ridge, extending through the central part of the county; and the rolling prairie section on the east, which is lower than the Pontotoc Ridge. In the extreme southwestern corner of the county there is a small area of hilly land.

The flatwoods section of Chickasaw County is a broad, level to faintly undulating belt, averaging about 8 miles in width, extending across the county from the northern to the southern boundary. The elevation of the flatwoods at Sparta is given as 300 feet above sea level.

The Pontotoc Ridge is an elevated triangular area, the higher part of which probably is 200 feet or more above the flatwoods. This ridge extends from a point just south of Houston northward through the center of the county, becoming wider toward the north. It includes hilly to rolling land, consisting of a series of parallel

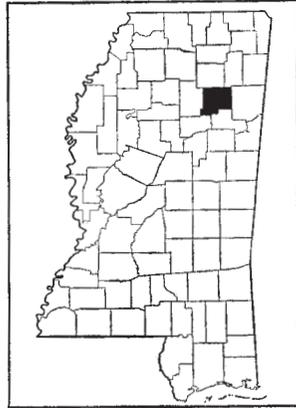


FIG. 1.—Sketch map showing location of the Chickasaw County area, Mississippi.

ridges running north and south. On the crests of these ridges there are some areas of level to gently rolling or sloping country.

The prairie section is a broad belt which extends entirely across the eastern part of the county from north to south, having an average width of about 12 miles. The elevation of this region is about 250 to 300 feet above sea level. It is level or nearly level to undulating, with some gently rolling areas and some ridges rising conspicuously above the general surface. The slopes are characteristically gentle and smooth. There are some outcrops of the white Selma chalk, or Rotten limestone, in the prairies, forming somewhat broken areas where the surface is dissected by erosion.

The Pontotoc Ridge forms an important drainage divide. The streams on the west eventually reach the Mississippi River, while those on the east flow into the Tombigbee River. Houlka Creek, which rises near the western part of the Pontotoc Ridge, carries a large part of the drainage of the eastern part of the county into the Tombigbee. Chookatonkchie, Tallabinnela, Red Bud, and Long Creeks and their tributaries are important drainage ways in this section of the county. The principal streams draining the western part of the county are Scoona, Yallabushah, Mud, and Topisaw Creeks. The southern part is drained by Cane Creek and its tributaries. Except in the flatwoods, the drainage is complete, all sections of the county being reached by drainage ways. The streams generally are sluggish and cut their channels very slowly. The stream valleys are comparatively shallow. Nearly all the streams have been deepened and straightened, and overflows are uncommon. Along the streams there are broad areas of bottom land, which are level and are interrupted only by occasional depressions representing remnants of old stream channels.

The first settlements in this county were made in the early thirties, mainly on Pontotoc Ridge. Most of the settlers were from the Carolinas and Virginia. The county was established in 1836. The population is reported in the 1910 census as 22,846, showing an increase of about 3,000 over that reported in 1900. Nearly 70 per cent of the population lives outside the towns and villages. There are two county seats, Okolona and Houston. The former is situated in the northeastern corner of the county, and is the largest town in the county, having a population of 2,584 in 1910. The latter is in the south-central part of the county and had a population of 1,400 in 1910. Okolona is on the main line of the Mobile & Ohio Railroad, and is one of the main traffic relay points between Mobile, Ala., and Cairo, Ill. A branch of the Mobile & Ohio extends from Okolona westward to Calhoun City in Calhoun County. Okolona has a large cottonseed-oil mill, a sawmill, a brick and tile plant, a grain elevator, and a creamery. Houston is reached by two railroads, the main line

of the New Orleans, Mobile & Chicago Railroad and a branch line of the Mobile & Ohio Railroad. It has a large cottonseed-oil mill, a compress, three gins, a planing mill, and a spoke factory. Other towns of local importance are Woodland and Houlika, on the New Orleans, Mobile & Chicago Railroad, Van Vleet on the branch line of the Mobile & Ohio, and Egypt on the main line of the Mobile & Ohio. Buena Vista, Parkersburg, Bacon, Pyland, Hall, Anchor, Atlanta, and Sycamore are smaller towns. The first agricultural high school in the State was established at Buena Vista.

Transportation is furnished by three railroads—the New Orleans, Mobile & Chicago Railroad, running north and south across the western part of the county; a branch line of the Mobile & Ohio Railroad, extending from Okolona, in the northeastern corner of the county, southwestward to Houston and thence westward; and the main line of the Mobile & Ohio Railroad, crossing the eastern part of the county.

Chickasaw County recently has constructed 50 or 60 miles of good gravel roads leading out of Houston and Okolona in several directions. These roads pass through some sections in which the roads in wet seasons were formerly almost impassable. The good roads from Okolona northward connect with the improved roads of Lee County, while those to the east and southeast connect with graveled roads in Monroe County. These stone-surfaced roads in Chickasaw County are of particular value in the flatwoods and the prairie regions.

#### CLIMATE.

In general, the climate of Chickasaw County is well suited to agriculture. It is typical of the warm temperate zone of the United States. The mean annual temperature is about 62° F. The winters are short, and while freezing temperatures usually occur in each of the winter months, periods in which the temperature is below zero are exceptional and of short duration. The mean temperature for the winter, including the months of December, January, and February, is about 44° F. January, February, and March usually are cloudy and damp.

The summers are long, and while the temperatures are not unusually high, the high humidity makes the heat oppressive at times. The mean temperature for the summer is about 78° F. There is an average of about 55 days with a temperature above 90°, and temperatures of over 100° occasionally are recorded in July and August. The average temperature for the spring is about 62°, and for the fall about 63°.

The average annual precipitation is about 48 inches. The rainfall is evenly distributed over this section of the State, and is lightest

during the fall months. March is the wettest month, having an average precipitation of about 6 inches, and October the driest, with an average of somewhat less than 2 inches.

The average date of the first killing frost in the fall is October 28, and that of the last in the spring March 28. The earliest killing frost in the fall recorded at the Weather Bureau station at Pontotoc, Pontotoc County, occurred October 9, and the latest recorded in the spring on April 17. There is a normal growing season of about 214 days.

The table below is compiled from records of the Weather Bureau station at Pontotoc, Pontotoc County. The data are representative of climatic conditions in Chickasaw County.

*Normal monthly, seasonal, and annual temperature and precipitation at Pontotoc, Pontotoc County.*

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.
	° F.	° F.	° F.	Inches.	Inches.	Inches.
December.....	45.2	81	2	4.61	5.76	5.14
January.....	43.3	84	4	4.88	2.95	4.65
February.....	44.1	81	-11	4.47	1.19	8.28
Winter.....	44.2	84	-11	13.96	9.90	18.07
March.....	54.0	89	15	6.01	6.45	8.06
April.....	61.8	92	26	3.70	2.17	4.83
May.....	69.4	95	37	3.57	.42	5.06
Spring.....	61.7	95	15	13.28	9.04	17.95
June.....	76.6	101	46	4.12	3.03	3.47
July.....	78.9	105	57	4.86	8.95	5.39
August.....	78.7	103	48	3.64	3.38	7.47
Summer.....	78.1	105	46	12.62	15.36	16.33
September.....	73.7	101	36	3.07	T.	9.41
October.....	62.3	94	28	1.58	T.	1.60
November.....	52.3	88	14	3.44	2.91	2.80
Fall.....	62.8	101	14	8.09	2.91	13.81
Year.....	61.7	105	-11	47.95	37.21	66.16

#### AGRICULTURE.

The early settlers in Chickasaw County grew a few subsistence crops, chiefly corn and vegetables, and raised cattle and hogs also mainly to supply household needs. Cotton became the money crop at an early date, soon after the invention of the cotton gin. It has continued the principal crop of the county, and until recently it was the only money crop. In late years the production of hay, chiefly

alfalfa and Johnson grass, has become important, the crop being grown for sale and for stock feed. At present increased interest is being taken in the raising of beef cattle. Corn has always had an important place on the farm, being grown mainly as feed for work stock.

Originally the area west of the Pontotoc Ridge was heavily forested. The uplands supported a dense growth, including post oak, red oak, Spanish oak, and shortleaf pine. The bottoms supported a still heavier growth, consisting chiefly of willow oak, overcup oak, water oak, sweet gum, black gum, ironwood, and hickory, with some post oak, yellow poplar, ash, and maple. This timber is rapidly being removed, even the small growth being used for crossties, implement handles, etc. The clearing of the bottoms has opened up some of the most productive land in the county, and the cleared area is being gradually extended as lumbering progresses.

Pontotoc Ridge once supported a hardwood forest growth, but now little timber remains, the smoother lands having been cleared and farmed for many years. The present scattered forest growth consists chiefly of red oak, white oak, hickory, walnut, gum, chestnut, and old-field pine.

In the eastern part of the county there are large areas of original prairie land, which supported only clumps of crabapple, honey locust, and wild plum. On uncleared portions of the higher, reddish and brown soils associated with the black prairie there is a growth of post oak, blackjack oak, and hickory. The bottom lands in this part of the county support a native growth of sycamore, ash, overcup oak, willow oak, water oak, black locust, and cottonwood.

Within the last few years a large area of bottom land, probably over 30,000 acres, has been canalled at considerable expense and converted into highly valuable farming land, being now practically free from the overflows which formerly made farming largely dependent upon the distribution of the rainfall. The reclamation of these highly productive bottoms represents one of the most important steps in the agricultural development of the county. Probably more than 50 per cent of the bottom land is now under cultivation, while formerly only a few scattered fields were cultivated.

The present agriculture of Chickasaw County consists of the production of cotton for sale, corn for farm use, and hay both for sale and for feeding, in combination with the raising of some beef cattle and hogs, the former for market and the latter mainly for home use. Some hogs are shipped out of the county. Cotton promises to remain the principal market product, owing to the adaptation of much of the land to this crop, the ease with which it is grown, and the ready market for it. The recently increasing attention given to corn, hay, and live stock indicates that these will have very important places in the agriculture of the county.

The 1910 census reports 48,595 acres in cotton and 32,404 acres in corn, with a total of 4,821 acres in hay and forage crops. The number of dairy cows on farms is given as 5,959. The census reports 726 calves, 5,799 other cattle, and 8,192 hogs sold or slaughtered on farms in 1909. A total of 29,358 peach trees and 5,889 apple trees is reported in the county, with 4,193 plum and prune trees and 1,304 pear trees.

The effects of the boll weevil were first felt in this county in 1913. This pest causes some damage to the cotton crop, particularly in wet seasons, but by so diversifying crops as to increase the hay, corn, and beef production the serious losses suffered by counties to the south have been avoided.

The raising of beef cattle is practiced in a small way by a large number of farmers, and is in the aggregate an important industry. The cattle are raised mainly on pasturage, being fed for short periods in the winter. Dairying is important in the vicinity of Okolona. The production of alfalfa, melilotus, and Johnson-grass hay on the prairie soils and bottom lands has within the last few years become an industry of considerable importance.

General farming, including cotton and corn production, is practiced throughout the county. In the black prairie belt in the eastern part and in the bottoms the growing of hay and forage crops in conjunction with corn and cotton have assumed greater importance than elsewhere. Most of the beef cattle are raised in the prairie belt. The bottom lands and black prairie lands are more extensively cultivated than the sandy lands of the Pontotoc Ridge and the heavy soils of the flatwoods in the western part of the county. The Pontotoc Ridge section has been under cultivation longest, but much of the land here that was formerly cultivated has been damaged by erosion. A very large part of the flatwoods country has never been cleared. The farmers of the county recognize that the bottom lands are peculiarly adapted to corn, grasses, and certain varieties of cotton, that the Houston clay is predominantly an alfalfa and forage-crop soil, and that vegetables give particularly good results on the sandy soils. In general, the present types of farming are well adapted to the soils and to transportation and market conditions.

The prevailing methods of growing cotton and corn on the bottom and prairie soils are more intensive than in the upland. The soils as a rule are plowed deep and in good season. In the upland the plowing is generally rather shallow. The intertilled crops are given frequent shallow cultivations.

The soils of the county have largely been impoverished and injured by erosion, especially on the rolling uplands. Crop rotations are not followed, except in a small way. Commercial fertilizers and barnyard manure are not used on the bottoms and to only a

small extent in the uplands, and where applications are made they are light. Generally no more than 200 or 300 pounds of commercial fertilizer is applied to the acre. The census of 1910 reports a total expenditure of \$2,480 for fertilizers, only 123 farms reporting their use. A comparatively small proportion of the upland soil is being improved by growing and plowing under soil-improving crops, such as the legumes.

Two-horse plows generally are used in breaking the fields and one-horse plows in cultivating the crops. The teams and implements are efficient, although the use of implements that cover more ground and the employment of greater horsepower per man would mark an improvement over present practices. Barns are generally small, but in most cases large enough for storing crops and housing the work stock. They usually are larger on the hay farms, but there is a general need for better barns throughout the county. Little shelter is provided for beef cattle, on account of the mildness of the winters.

Generally an adequate supply of labor is available at moderate prices, although at times labor is scarce. Most of the farm labor is performed by the owners or tenants and their families, but considerable negro labor is employed on the larger farms, both by the day and by the month. For picking cotton laborers are paid about 60 cents a hundred pounds. Farm hands receive \$12 to \$15 a month with board. The census reports a total expenditure of \$41,780 for labor in 1909.

Of the land area of the county the 1910 census reports 76.1 per cent in farms, and of this 53.3 per cent is reported improved. The average size of the farms is given as 70.3 acres,<sup>1</sup> of which 37.5 acres are improved. A total of 3,474 farms is reported. Owners operate 32 per cent of the farms and tenants practically all the remainder. Land is rented usually on the share basis. The tenant generally receives one-fourth of the corn and one-third of the cotton produced, the landlord furnishing the land and a house.

Farm land ranges in value from about \$5 or \$8 to \$65 or \$75 an acre, according to the character of the soil, the farm improvements, and location with respect to improved highways, railways, and markets. The average assessed value of farm land is reported in the 1910 census as \$14.17 an acre.

#### SOILS.

The upland soils of Chickasaw County are derived from (1) Coastal Plain deposits, which were formed through the transportation of material, in past geologic time, from the highland areas to

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<sup>1</sup> Each tenancy is tabulated as a "farm." The average holding is considerably larger than the figure given.

the north and east, and from (2) material which appears to be partly of wind-blown origin.

The Coastal Plain material probably was derived largely from the sandstone, shale, and limestone soils of the Appalachian and Limestone regions, having been transported by water, modified through processes of assorting and abrasion, and finally left, with the recession of the water, as upland. Subsequently this material has been changed by oxidation, leaching, and the incorporation of vegetable matter. There were differences in the original deposits, due to differences in the conditions of sedimentation and in some places to an admixture of lime. The various strata range from heavy clay of a noncalcareous nature and highly calcareous clays or chalky material (rotten limestone) to sandy clays.

The material of supposedly wind-blown origin or influence has also undergone changes through the agencies of oxidation or retarded oxidation and plant growth.

On Pontotoc Ridge, crossing the center of the county, the soils consist predominantly of sandy loams and sandy clays, containing considerable quartzose material. Over the level and gently rolling areas of the eastern part of the county they consist prevailingly of highly calcareous clays, classed with the Houston series. Other clays, too low in their carbonate content to effervesce in acid either in soil or subsoil, are classed with the Oktibbeha. Through the flatwoods of the western part of the county the material consists of grayish noncalcareous silt and clay, and in the associated undulating and gently rolling areas of brownish silt and clay.

The alluvial soils of the overflowed stream bottoms consist predominantly of silt and clay. They are derived from recently deposited material, laid down by overflow waters, which is being added to where overflows occur. This material is derived from the various soils occurring in the drainage basins of the streams. Where there is considerable wash from the calcareous Houston soils, a black soil, classed with the Trinity series, is developed in the bottoms. Where the wash is mainly from the red upland soils, the Orangeburg and Greenville, reddish alluvial soils, mapped as the Hannahatchee series, occur. Those soils washed mainly from such upland soils as the Ruston and Pheba are brown and are classed with the Ochlockonee series.

There is some old alluvium on the stream terraces or second bottoms, which consists of material deposited when the streams were flowing at higher levels than at present.

Twenty-five distinct soil types, including Chalk (Houston material) and Rough gullied land, are mapped in Chickasaw County. These are classed with 14 series.

The Pheba series is characterized by light-brown surface soils and by yellowish to light-brown subsoils. The subsoils usually are

compact and are mottled with brown and gray in the lower part. Ferruginous concretions and concretionary material are common in the lower subsoils. These soils have a high silt content. The surface configuration varies from level to undulating. The surface drainage frequently is inadequate and the compact substratum retards internal movement of air and moisture. These soils resemble the Memphis in the surface soil and upper subsoil, but differ in having a more compact and more mottled lower subsoil. In many places the lower subsoil has been influenced by sand from underlying Coastal Plain deposits. In Chickasaw County the Pheba fine sandy loam, silt loam, and clay are mapped.

The Lufkin series includes types with soils and gray or mottled grayish and yellowish, heavy, impervious, plastic subsoils. The difference between the texture of the surface soil and that of the subsoil is very marked, especially in the sandy loam type. These soils characteristically occupy level and undulating areas. Both the surface drainage and underdrainage are imperfect. The heavier soils of the series require strong teams and implements for efficient preparation of the seed bed. They compact seriously in dry weather. The Lufkin fine sandy loam, silt loam, and clay are recognized in Chickasaw County.

The Ruston soils are marked by the gray to grayish-brown color of the surface soils and the reddish-yellow to yellowish-red or dull-red color and moderately friable structure of the prevailing sandy clay subsoils. This series is intermediate between the Orangeburg and Norfolk soils in point of subsoil color and between the Orangeburg and Norfolk on the one hand and the Susquehanna on the other in point of subsoil structure. Occasionally the lower subsoils are faintly mottled with gray and shades of yellow. The Ruston soils are closely associated with the Orangeburg and Susquehanna; they probably are derived from practically the same formation as the Orangeburg. In Chickasaw County the Ruston series is represented by the sandy loam, fine sandy loam, and clay loam types.

The Orangeburg soils are derived from Coastal Plain material, largely beds of sandy clay. The surface soils usually are gray to brown, and are almost invariably underlain at a depth of 3 feet or less by red or yellowish-red, friable sandy clay. The prevailing red color of the subsoil is the characteristic feature distinguishing the Orangeburg from the Norfolk series. The Orangeburg soils may be considered as the Coastal Plain equivalent of the Cecil series of the Piedmont Plateau, but their subsoils are much more sandy and friable. These soils are well drained. The steeper slopes are subject to serious erosion. The fine sandy loam is the only type of this series identified in Chickasaw County.

The Greenville surface soils are reddish brown to dark red, and generally are loamy. The subsoils are red in color and friable. These

soils occupy level to gently rolling areas in the Coastal Plain uplands. They are closely associated with the Orangeburg series in distribution, and like the Orangeburg soils are derived from Coastal Plain material. In certain localities there apparently is some influence from the underlying limestone. The surface material shows a tendency to compact in dry weather, causing a loss of moisture; otherwise the soils possess desirable characteristics with respect to moisture conditions. The Greenville clay loam occurs in Chickasaw County.

The Susquehanna series includes gray to brownish or reddish surface soils, underlain by plastic, heavy subsoils, characteristically mottled red, grayish, and yellowish. Where the basal clays are exposed by erosion they often show brilliant colorings of bright red, dark red, purple, gray, drab, and white. The clay material is derived from Coastal Plain beds of heavy clay. These soils have a level to rolling topography. They are often found on the lower slopes near streams, where the higher positions are occupied by soils with larger quantities of sand in the subsoil. The surface drainage is good except in the level areas, but the impervious nature of the subsoil retards underdrainage and the internal movement of air and moisture. Where the intractable clay lies near the surface the soils are difficult to till and are of low productiveness. The Susquehanna clay is the only member of the series encountered in Chickasaw County.

The Houston series occurs principally in the black, calcareous prairie regions of Alabama, Mississippi, and Texas. The soils are characterized by their high content of lime, especially in the subsoil, which in some places consists, in the lower part, of white, chalky limestone. The surface soils are grayish brown to black, while the subsoils are characteristically yellowish or greenish yellow, with mottlings of gray or white. The series has been derived from the weathering of calcareous clay, chalk beds, and rotten limestone. In some localities remnants of later sandy and gravelly deposits have been mixed with the calcareous material, giving rise to lighter textured members of the series. The surface material on drying breaks into small aggregates, giving it a desirable structure. The surface is level to undulating or gently rolling, and the drainage is prevailingly good. In Chickasaw County the Houston series is represented by the clay type.

The Oktibbeha soils occur in association with the Houston types, and are known as "post-oak" soils. They have grayish to brownish or reddish-brown surface soils, and subsoils characteristically consisting of brownish-red clay passing into mottled reddish, drab, and yellowish or mottled yellowish and drab, plastic, heavy clay. Frequently the clay is mottled reddish and yellowish or drab very near the surface. In places the subsoil is greenish yellow in the lower part, with little

or no mottling. In some areas these soils are very similar to the Susquehanna, but they are more productive, apparently having been influenced by underlying calcareous material. Also the soil is usually browner and the lower subsoil yellower than the corresponding sections of the Susquehanna soils. The material is derived from Coastal Plain deposits. The surface is mainly level to undulating. The drainage is imperfect in many of the level areas. These soils differ from the associated prairie soils, at least in Alabama and Mississippi, in having an original growth of timber, mainly post oak. The Oktibbeha fine sandy loam and clay are mapped in Chickasaw County.

The surface soils of the Sumter series are yellowish to brownish; the subsoils are brighter yellow or greenish yellow. There is an abundance of partially weathered calcareous rock or shell fragments coming from the parent limestone. These soils differ from the Houston in that the surface soils have a browner color; they differ from the Oktibbeha in the lower degree of mottling and in the higher lime content. The Sumter soils occur in the Coastal Plain, usually in small areas. They are very productive where the topography permits satisfactory cultivation. The Sumter clay is identified in the Chickasaw County survey.

The soils of the Hannahatchee series are characterized by the brown to reddish-brown color of the surface material and by the pre-vaillingly reddish-brown color of the subsoil material. Locally the color of the subsoil is mottled, on account of the incomplete mixing of various grades of alluvium from the different upland soils. The Hannahatchee soils occupy the overflowed first bottoms of Coastal Plain streams. They are composed of wash from Coastal Plain uplands, carrying sufficient material from the Susquehanna, Orangeburg, and Greenville soils to impart a characteristic reddish color, as distinguished from the brownish color of the Ochlockonee soils. The Hannahatchee fine sandy loam and silty clay loam are recognized in Chickasaw County.

The Ochlockonee series comprises brownish surface soils and lighter brown or mottled brownish, yellowish, and grayish subsoils. The series includes the brownish soils of the first bottoms of Coastal Plain streams, composed principally of wash from the upland Coastal Plain soils. They are subject to overflows, but between overflows the drainage generally is fair to good. In Chickasaw County the Ochlockonee silt loam and silty clay loam are mapped.

The Trinity series includes the dark-brown to black first-bottom alluvial soils derived mainly, or in considerable part, from the soils of the Houston series. The organic-matter content is high and lime usually is present in sufficient quantities to effect good structural

conditions. These soils occur in the level first bottoms of streams rising in or flowing through areas of Houston soils. They are subject to overflows, but between overflows have fair to good drainage. When wet the soil is extremely sticky, but on drying it usually crumbles to a desirable tilth. Only the clay member of this series is encountered in the Chickasaw County survey.

The Myatt series is characterized by the gray color of the surface soils and the gray to mottled gray and yellow color and impervious character of the subsoils. This series represents the most poorly drained land of the Coastal Plain stream terraces. The soils lie principally above overflow, but are so flat that water stands on the surface for considerable periods after heavy rains. Occurring in close association with the Cahaba and Kalmia soils, they are composed of about the same kind of material, the difference being due largely to the very poor drainage of the soils of this series. By means of ditching the Myatt soils can be brought into condition for cultivation. In Chickasaw County the Myatt fine sandy loam is mapped.

The surface soils of the Cahaba series are brownish, and the subsoils yellowish red to reddish brown. These soils occupy old-stream terraces lying largely above overflow. They represent the best drained lands of these terraces. The material consists of wash from Coastal Plain upland soils. The Cahaba fine sandy loam occurs in Chickasaw County.

In the following pages the various types or members of the series are described in detail, and their relation to the agriculture briefly shown.

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

*Areas of different soils.*

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Lufkin silt loam <sup>1</sup> .....	31,104	9.6	Myatt fine sandy loam.....	9,344	2.9
Oktibbeha clay.....	28,800	9.0	Hannahatchee fine sandy loam	8,448	2.6
Ruston fine sandy loam.....	27,712	8.6	Greenville clay loam.....	5,440	1.7
Lufkin clay.....	25,856	8.1	Ruston sandy loam.....	4,416	1.4
Pheba silt loam.....	22,208	6.9	Sumter clay.....	4,096	1.3
Ochlockonee silty clay loam...	21,696	6.8	Orangeburg fine sandy loam...	4,096	1.3
Ruston clay loam.....	21,376	6.7	Oktibbeha fine sandy loam...	2,944	.9
Hannahatchee silty clay loam.	21,376	6.7	Rough gullied land.....	2,880	.9
Trinity clay.....	16,960	5.3	Cahaba fine sandy loam.....	2,816	.9
Ochlockonee silt loam.....	16,704	5.2	Chalk (Houston material)....	2,752	.9
Houston clay.....	16,000	5.0	Pheba clay.....	1,984	.6
Pheba fine sandy loam.....	12,096	3.8			
Susquehanna clay.....	9,536	2.9	Total.....	320,640	.....

<sup>1</sup> Includes Lufkin fine sandy loam.

## PHEBA FINE SANDY LOAM.

The Pheba fine sandy loam consists of a light-brown to yellowish-brown fine sandy loam, which passes at an average depth of about 5 or 6 inches into a yellowish-gray, heavy fine sandy loam to silty clay loam. This grades at about 8 to 12 inches into reddish-yellow, compact clay, mottled in the lower part of the 3-foot section with gray or drab. Usually the yellow of the lower subsoil is paler than that of the upper subsoil, showing less red. Rusty-brown and darker colored concretions of small size are of common occurrence in the subsoil.

This type occurs mainly southeast and northeast of Houston and south and east of Houlka but is not very extensive. It occupies flat areas and slopes. The slopes are either long and gentle or moderately steep. Many of the hills and ridges capped with Ruston or Orangeburg soils have areas of the Pheba fine sandy loam on their slopes. The type occurs also as slight elevations in areas of Lufkin soils. It is mainly well drained.

About one-half the type is cultivated. Cotton is the chief crop. Some corn is grown for the work stock. The type is considered a fair corn soil, but cotton does better, giving fairly good results with a normal rainfall evenly distributed through the growing season. The yields are easily increased by the application of commercial fertilizers or manure or by growing legumes in rotation with other crops. Light applications of low-grade fertilizer frequently are made for cotton.

Moderately deep fall plowing, the maintenance of a good supply of organic matter in the soil, and moderate fertilization and manuring appear to be the main requirements for maintaining the productiveness of this land. Very little stock is kept, but the type is well suited to the various forage crops common to the region, and cattle and hogs could be raised with success.

## PHEBA SILT LOAM.

The Pheba silt loam consists of light-brownish silt loam, underlain at about 6 to 10 inches by reddish-yellow to yellow, moderately friable clay. This passes below into mottled yellowish and grayish or drab clay, which is often compact, frequently contains ferruginous concretions, and shows mottlings of rusty brown and red.

In some of the flat areas, and to some extent on the lower slopes, in the eastern part of the county the soil is grayer and the subsoil is pale yellow and quite plastic, especially when wet. The lower subsoil in such places is mottled pale yellow and drab, and frequently contains rusty-brown and black concretions and concretionary material. The soil of these areas is not so well drained as is that where a reddish hue is developed in the upper subsoil.

This type occurs most extensively in the western part of the county, with some areas east of Pontotoc Ridge and a few in the eastern and southeastern parts of the county. The principal areas are those around Houston, Anchor, Woodland, Friendship School, Scoona Valley Church, west of Thelma, and north of Hall.

The surface is characteristically undulating to gently rolling, with smooth, gentle slopes. Most of the type is associated with the Lufkin soils, lying at a higher elevation and having better drainage. Except on some of the lower slopes and in the more nearly level areas, the drainage is good, and the soil holds moisture very well, provided tillage is frequently performed in periods of dry weather.

This is an extensive soil, of considerable agricultural importance. Probably about 75 per cent of it is under cultivation. Cotton is the principal crop, and the only money crop with the exception of some truck grown in the vicinity of Woodland. Corn is grown as a subsistence crop. It is fed to the work stock and the small number of cattle raised, and is used for corn meal for home use. Oats were grown more extensively in 1914 than for many years.

The main type of farming followed on the Pheba silt loam consists of cotton growing, with corn and oats grown for use on the farm. One-horse plows are mainly used in the cultivation of this soil, but two-horse plows are frequently used for breaking the land. The farm buildings are generally small.

The average yield of cotton is about one-half bale per acre. Corn yields about 15 to 20 bushels and oats about 20 to 30 bushels.<sup>1</sup> Much higher yields are reported where better methods of soil management are employed. In the vicinity of Woodland a number of farmers produce truck crops on a small scale, growing mainly cabbage, tomatoes, sweet potatoes, snap beans, and garden peas. These crops and a number of other vegetables do well, as do also strawberries.

Fertilizers are used in a small way for cotton and corn. Cottonseed meal and acid phosphate, in the proportion of 1 to 2, are sometimes applied at the rate of about 200 pounds per acre.

The present value of this land is about \$10 to \$35 an acre, according to the distance from railroads and improved highways and the condition of farm improvements.

This type is susceptible of easy improvement, especially by deep, seasonable plowing. Fall plowing somewhat deeper than that now practiced is needed, also the growing, in rotation with cotton and corn, of crops such as cowpeas, soy beans, and peanuts in the summer and vetch, crimson clover, and bur clover in the winter, to supply vegetable matter to the soil. These legumes improve the land, whether plowed under or cut for hay. Applications of lime have

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<sup>1</sup>The statements of yields given in this report are based upon field observations and upon the estimates of farmers.

proved beneficial. In general, acreage applications of about 2 tons of ground limestone should prove profitable.

The raising of cattle and hogs for market should prove successful on this type, as good native pasturage of lespedeza and various grasses is available, while a number of valuable forage crops, such as sorghum, cowpeas, soy beans, and peanuts, do well.

#### PHEBA CLAY.

The Pheba clay consists of a brownish clay loam or clay mottled with rusty brown, underlain at about 3 to 5 inches by a mottled pale-yellow and drab plastic clay which is very stiff and impervious in the lower part. Rusty-brown mottling is common throughout the 3-foot section in the more poorly drained areas, and black material resembling oxide of iron is abundant in the subsoil. Small concretions about the size of buckshot are plentiful on the surface and throughout the soil in these wetter areas. Where the slope is steeper or the elevation greater than typical, and the drainage conditions consequently better, yellow is prominent in the surface soil and the subsoil is a yellow clay grading into mottled yellow and drab clay.

The native forest growth on the Pheba clay consists mainly of post oak, water oak, willow oak, hickory, and black gum.

This type occurs in small areas in the eastern half of the county. The largest area is located at Clarks Church.

The surface is characteristically level and the drainage is poor, both because of the topography and the imperviousness of the clay subsoil.

This soil is not very important in Chickasaw County on account of its small extent. A large part of the type is under cultivation to cotton and corn, and oats are grown to some extent. Cotton apparently does better than the other crops. Yields are low in very dry or very wet years, but good results with oats, corn, and cotton are reported in years of moderate, well-distributed rainfall.

The type is in need of better drainage. In its present condition, with crops often poor on account of unfavorable seasons, the soil is perhaps best used for pasture. Lespedeza succeeds and affords good grazing. Applications of lime probably would prove beneficial.

#### LUFKIN SILT LOAM.

The surface soil of the typical Lufkin silt loam, known as "flat-woods land," consists of a light-brown to grayish-brown silt loam, grading at about 5 to 8 inches into a gray silty clay loam, which shows some rusty-brown mottling. The subsoil, beginning at about 8 to 15 inches, is a gray, compact, tough clay, with some yellowish-brown mottling. The subsoil in many instances has a greenish tint.

In a few places there is but little change in the texture of the material from the surface downward.

Occasionally brownish and black concretions and concretionary material, probably iron oxide, are present in the subsoil in sufficient quantity to give the material a compact structure, like a hardpan. This condition is noticeable particularly in slight depressions or level areas where the drainage is exceptionally poor. When dry the surface material is whitish; when wet it is brownish or dark gray. In some fields the moderately moist surface soil is of a brownish color, owing to the vegetable matter incorporated with the soil in cultivation. The type includes on slight elevations some small areas of Pheba silt loam, which are not separately mapped, on account of their small size.

The Lufkin silt loam is encountered mainly in the western part of the county, just west of Pontotoc Ridge. It occurs in extensive tracts. The largest, that northwest of Houston, has an area of about 30 square miles, and is interrupted only by occasional stream bottoms. Other large areas are mapped around Houlika, Hall, and Pyland, and west of Anchor. This is the most extensive type in the county, covering an area of 48.6 square miles.

The surface is flat to faintly undulating, and the drainage is poor, both on account of the rather level surface and the impervious subsoil. The type receives considerable run-off from the associated higher land of the Pontotoc Ridge, which, together with the rainfall, spreads out over the surface and disappears slowly. Ditching is necessary to provide proper surface drainage. Some of the areas have more or less slope, and consequently much better drainage.

There is a much larger proportion of this type under cultivation than of the Lufkin clay, probably 25 to 30 per cent being devoted to crop production. This soil is much easier to handle than the clay, and is better drained and more productive. It generally works up into a somewhat cloddy condition, especially where the content of organic matter is low, but the clods are readily pulverized by harrowing, and ordinarily the land can be put in good tilth with a moderately heavy equipment of tools and teams. Good results have been obtained where heavy applications of rotten limestone or green-sand marl from the west side of Pontotoc Ridge were used in conjunction with the turning under of green-manure crops, such as cow-peas, oats, and vetch.

Cotton and corn are the chief crops grown. The former is the money crop, while the latter is grown mainly as feed for the work stock and for making corn meal. Some cattle are raised on the type. Cotton yields an average of about one-half bale per acre, and corn about 15 to 20 bushels per acre. The yields vary widely with the

seasons. Wet periods and long droughts sometimes cause crop failures. In fertilizing this soil, light applications of ordinary grades of commercial fertilizers are made for cotton and to a less extent for corn. Some farmers use acid phosphate in light applications, as well as cottonseed meal, and all the available barnyard manure.

The native forest growth on the type consists of oak, with some hickory, loblolly pine, and shortleaf yellow pine. There are a few glades with a sparse growth of oak and persimmon.

The value of land of the Lufkin silt loam depends on its location and its access to good roads, the present price ranging from about \$5 to \$20 an acre.

A prevailing supposition is that the flatwoods soils have an excess of lime, but chemical analysis shows that this theory is erroneous,<sup>1</sup> and the application of lime or ground limestone would probably be beneficial.

Rice is successfully grown on the Lufkin silt loam in southwestern Arkansas. The important rice soils of the Crowley, La., and Stuttgart, Ark., districts are very similar to this type, and if water can be obtained at a reasonable cost, this soil could probably be successfully used for rice. As lespedeza and a number of forage crops succeed, stock raising apparently could be extended with profit. The construction of ditches is needed to provide good surface drainage. Crops like corn and cotton would probably do better if grown on beds, to insure somewhat better drainage. Deep plowing and the incorporation of organic matter in the form of barnyard or green manures have proved effective means of increasing crop yields on a number of the better farms.

LUFKIN FINE SANDY LOAM.

Areas shown on the soil map with inclusion symbol on the Lufkin silt loam color represent the Lufkin fine sandy loam.

The surface soil is a gray fine sandy loam, grading at about 6 inches into a yellowish fine sandy loam faintly mottled with gray or brown. The subsoil, beginning at about 12 to 18 inches, is a mottled gray and yellowish fine sandy clay, which is plastic and sticky in the lower part of the 3-foot section. Small iron concre-

<sup>1</sup> Hillgard's analysis (Geological and Agricultural Report on Mississippi) of a sample of this soil shows a content of 0.083 per cent of lime. The following table shows the results of a chemical analysis by Hillgard of a sample of the Lufkin loam to a depth of 12 inches:

Insoluble matter .....	93.575	Peroxide of iron.....	1.445
Potash .....	.254	Alumina.....	2.605
Soda .....	.066	Phosphoric acid .....	.008
Lime.....	.083	Sulphuric acid.....	Trace.
Magnesia .....	.175	Organic matter and water.....	1.333
Brown oxide of manganese.....	.111		

tions about the size of buckshot are in places scattered over the surface and through the subsoil.

This type occurs along the foot of the Pontotoc Ridge on the west slope. It occupies rather small areas which lie somewhat higher than the associated Lufkin silt loam and clay. The drainage is better than that of the heavier members of the series, and the soil can be tilled under a much wider range of moisture conditions.

The type is of comparatively little importance, owing to its small extent. It is used chiefly for the production of cotton and corn, giving about the same yields as the Lufkin silt loam. Light applications of fertilizers of low grade are generally made for cotton and occasionally for corn. This soil is easier to cultivate than the silt loam, and is adapted to a wider range of crops. Potatoes, peanuts, cowpeas, and other crops have proved successful in small fields. The present value of this land is about \$5 to \$8 an acre.

The soil could be made more productive by increasing the organic-matter content, especially by growing the legumes, such as cowpeas, in rotation with other crops.

#### LUFKIN CLAY.

The Lufkin clay consists of a light-gray clay which passes quickly into compact, tough clay of light-gray to light-drab color. Frequently there is a thin surface covering of silt loam or silty clay loam, usually not over 2 or 3 inches deep. Often the subsoil shows a greenish tint, and mottling of yellowish is not uncommon in the lower part. On drying the surface material compacts and assumes an ashy-gray color.

This type occurs in the western part of the county, principally west of Houston and around Prospect Church. It occupies mainly level to very gently undulating areas, known as flatwoods. A part of the type occurs on long, gentle slopes, and some areas of less importance are found on the slopes of drainage ways. The drainage is imperfect, water standing on the surface of the level areas, which comprise a large part of the type, for comparatively long periods after heavy rains. The poor drainage is due to the level surface and the dense, impervious subsoil. The dense clay subsoil also hinders aeration.

Very little of this soil is under cultivation; most of it is forested, the timber growth consisting principally of oak, shortleaf yellow pine, and loblolly pine, with some black gum and hickory.

Corn and cotton are the principal crops. The average yields are low. This soil is difficult to till and to keep in good structural condition, as it clods and bakes. It is used successfully in parts of Louisiana and Arkansas for the production of rice and lespedeza. This land sells for about \$3 to \$5 an acre.

## OKTIBBEHA FINE SANDY LOAM.

The soil of the Oktibbeha fine sandy loam is a light-brown to grayish-brown loamy fine sand to fine sandy loam, about 6 to 8 inches deep. This is underlain by a brownish-yellow silty clay, which extends to a depth of about 18 or 20 inches, passing into brownish or yellowish-red heavy clay, with gray and red mottlings. Usually the soil in the surface few inches has a slightly darker color than the subsurface material, owing to the presence of dark organic matter, particularly in forested areas. After a few years of cultivation to such crops as cotton and corn, the surface layer becomes distinctly gray. The whitish, chalky material of the underlying rotton-limestone formation is seldom encountered within the 3-foot section.

This type occurs in the prairie section, being associated with the Oktibbeha and Houston clays in the eastern part of the county. It is forested, and is classed with the "post-oak" soils of the prairie belt. The principal areas are those about Chalk Bluff School, along the Clay County line near Pleasant Plain Church and in the north-eastern corner of the county near Blackoak Church. This soil lies somewhat higher than the associated Oktibbeha and Houston clays, usually occurring as slight knolls. It is a well-drained soil, and efficient cultivation can be performed with comparatively light implements.

The type is not very extensive. Most of it is in cultivation, being used principally for cotton, some corn and oats being grown for the work stock. Cotton yields from one-half to one bale per acre under the best seasonal conditions and with good soil treatment, including the application of moderate quantities of barnyard manure, cottonseed meal or commercial fertilizer.

Among the crops which are grown successfully, but in a small way, are cowpeas, oats, vetch, soy beans, peanuts, sweet potatoes, watermelons, and strawberries.

It is necessary to keep this soil well supplied with vegetable matter, which can be done by growing the legumes in rotation with other crops.

## OKTIBBEHA CLAY.

The Oktibbeha clay consists of a dull-red to brownish-red clay, which grades into mottled red and yellow or red, yellow, and drab, plastic clay. In places the soil is reddish yellow, and grades below into greenish-yellow, plastic clay or pale-yellow, plastic clay mottled with drab. Mottled yellowish and whitish, friable, calcareous clay is encountered within the 3-foot section in some places, especially on slopes, but usually deeper than this. The lower subsoil in places is much like that of the Sumter clay, but the surface soil is more plastic, and much more like the soil of the Susquehanna clay. There

are included areas of Sumter clay in the more eroded places, and patches of the Oktibbeha silt loam and silty clay loam also occur. The soil is locally called "post-oak land," on account of the abundance of post oak in the forested areas.

The Oktibbeha clay occurs in the eastern part of the county, being most extensively developed west of Okolona. Typically the soil is nearly level to gently sloping. In the level areas the drainage is imperfect; the slopes are well drained. There are some eroded areas on the slopes and a part of the type is too eroded and gullied for cultivation. Good drainage can be established over the flats by tiling or ditching. Some areas are being tiled.

This is an extensive and important soil. Only about 30 or 40 per cent of the type is under cultivation, but the uncultivated areas are valuable for farming, even the wettest and most eroded, as the former can be drained and the latter can be used for pasture.

Cotton is the main crop. Corn and oats are grown, chiefly for the work stock. Cotton yields from about one-third to three-fourths bale per acre in favorable seasons and with good soil management. The average yields of other crops are low.

The raising of cattle for market has lately received increasing attention. The stock is pastured through the summer and fed during January and February and part of December and March, the concentrated feed consisting mainly of cottonseed meal.

Pasturing to cattle causes some packing of the soil, but this condition is improved where the manure is used on the land and where organic matter is occasionally plowed under. The use of lime also tends to prevent this packing of the soil.

Efficient seed-bed preparation requires the use of heavy teams and implements and harrowing after the breaking of the land to reduce the clods that are formed. Cultivation is limited to a narrow range of moisture conditions, as the soil puddles and subsequently bakes if plowed when the land is wet enough to be miry.

The barns are mainly small, although in the vicinity of Okolona, where there is some dairying, large barns and silos have recently been built. There are some silos elsewhere in the prairie belt. Very little commercial fertilizer is used. Barnyard manure gives good results.

At present the value of this land ranges from about \$15 to \$30 an acre. Some farms nearer the towns and the improved highways and farms that include some Houston clay or bottom land sell at higher prices.

For the improvement of this type the level areas should be drained and the eroded areas used for pasture crops, such as melilotus, Johnson grass, Bermuda grass, and lespedeza. The legumes, such as melilotus, cowpeas, lespedeza, soy beans, vetch, bur clover, crimson clover, hop clover, and red clover, which can be successfully grown on this

soil, should be included in rotations with the clean-cultivated crops. By keeping the soil well supplied with organic matter grazing can be carried on without danger of destructive erosion or compacting and baking of the soil. In addition to the possibilities offered by cattle raising and dairying, hogs also can be raised successfully on this land by grazing and feeding.

#### SUSQUEHANNA CLAY.

The typical Susquehanna clay consists of a dull-red clay, abruptly passing into a mottled red and drab or red, drab, and yellowish, plastic clay, which is very sticky when wet. In places, especially on slopes, the subsoil is a pale-yellowish to slightly greenish yellow, extremely sticky clay. In some places on slopes the surface soil is a yellowish clay and the subsoil a mottled reddish, drab, and yellowish, plastic clay. There is over much of the type a thin surface covering of grayish to brownish fine sandy loam to silty clay loam, ranging in depth up to about 5 inches. The type is locally styled "blackjack prairie" and "red prairie," but it is not a prairie soil, being forested in its natural condition with blackjack oak and post oak, with some pine and hickory.

This soil occurs largely in two areas in the vicinity of Sycamore and Center Hill Church. The surface is level to sloping. Internal drainage is poor, on account of the density of the clay. Surface drainage is good in the sloping areas.

The Susquehanna clay is not an important soil, because of its intractable nature and the low average yields of such crops as are grown on it. Only a few patches here and there are cultivated. These are devoted to cotton, which is the only cultivated crop that gives even moderately good yields. Lespedeza grows wild and affords some pasturage. The soil can be cultivated only when dry enough not to be sticky, and it is a week or more after a heavy rain before the land can safely be plowed. If stirred when wet the soil puddles and subsequently bakes.

The best use of the type seems to be for pasture. The application of ground limestone at the rate of 2 tons per acre has given good results.

#### HOUSTON CLAY.

The surface soil of the Houston clay is a brown to dark-brown clay. A yellowish, plastic clay with a faint greenish cast is encountered at depths of 6 to 10 inches. The yellow increases with depth, the material usually at depths of less than 20 inches being a greenish-yellow plastic clay. On lower slopes the soil is deeper and darker, often being black. There is a variation of this type which apparently represents a gradational soil between the typical Houston clay and the Oktibbeha clay. This occurs in level to gently sloping

areas, and consists of dark-brown to black or nearly black clay, underlain at 8 to 14 inches by yellowish-brown plastic clay which quickly grades into pale-yellow plastic clay mottled with drab or red, or both. The subsoil resembles that of the Oktibbeha clay in places. This variation is poorly drained, is lacking in lime, and does not yield as well as the typical soil. In typical areas of the Houston clay both the surface soil and subsoil are calcareous. The soil is very sticky when wet, but crumbles to a desirable condition on drying.

This type is confined to a belt running north and south across the eastern part of the county. This belt is interrupted by areas of other soils, chiefly the Oktibbeha. The surface is gently undulating, the slopes being long and gentle. The drainage is good, except in the level areas.

This is one of the most important soils in the county. Practically all the type is under cultivation. It has produced good yields for long periods without the use of manures or fertilizers.

Cotton is the chief crop grown. Johnson grass and alfalfa are grown for hay for market. Some corn is produced for use on the farm, chiefly as feed for work stock. Cotton yields from one-half to 1 bale per acre, Johnson grass about 3 tons in 3 or 4 cuttings per year, and alfalfa about 3 or 4 tons per acre per season under favorable conditions. Where Johnson-grass lands are disked in the early spring, yields of more than 3 tons of hay per acre have been obtained. Stock raising on this type is receiving increased attention, both cattle and hogs being raised for market by many farmers. Sheep raising also is beginning to attract attention. Dairying is carried on in a small way. The type ranks high as a stock soil, as it produces an abundance of good forage and can be grazed without serious injury to the soil. Among the good stock-feed crops which have proved successful are soy beans, cowpeas, Johnson grass, melilotus, alfalfa, Bermuda grass, lespedeza, and crimson, red, and bur clover.

Fertilizers have not been used to any important extent, but applications of barnyard manure have given good results. Rotations have not been regularly practiced. Some fields which are said to have been in cotton continuously for 50 years are still producing well, where the crop is not damaged by the boll weevil.

The growing of leguminous crops improves the soil, and they are generally followed by increased yields of other crops. Deep fall plowing has been found to be very beneficial on this type. The level areas can be improved by tiling. Dairying could apparently be successfully extended. This soil is now valued at about \$40 to \$75 an acre.

#### CHALK (HOUSTON MATERIAL).

The type mapped as Chalk (Houston material) comprises white to bluish rotten limestone, of the Selma chalk formation, which has

been exposed by erosion. It occurs on slopes where the rapid runoff of rainwater has swept off any soil covering that may have existed. As mapped the type includes patches of Oktibbeha clay and Houston clay which can not be mapped separately, on account of their small size.

The Chalk (Houston material) occurs through the "black-prairie" belt in the eastern part of the county, chiefly on steep slopes to drainage ways or to stream bottoms. The principal areas occur in strips bordering the bottom lands of Tallabinnela, Sugar Run, Mattubby, and Chookatonkchie Creeks. Other patches, some of which are too small to show on the map, occur within areas of the Houston clay and the Oktibbeha soils. It varies in thickness from a few feet to 200 or 300 feet.

The typical Chalk (Houston material) is mainly barren of vegetation. It can be made to produce sweet clover, and it is probable that by covering areas with this crop a productive soil could eventually be developed, which could be used for forage and pasturage crops. Cultivation is unsafe because of erosion.

At present land of this type has practically no separate selling value.

One of the State limestone-crushing plants is located on this type near Okolona, and will convert this chalk into ground lime for the farmers of the State at cost.

#### SUMTER CLAY.

The Sumter clay consists of a brown to yellowish-brown or yellow clay which quickly grades into pale-yellow clay and this into mottled yellowish or greenish-yellow and whitish, calcareous, crumbly clay. The surface layer is dark colored where organic matter has accumulated and yellow where erosion has exposed the clay. This yellow clay is very sticky when wet. There are present in the material fossil shells and fragments of limestone or of weathered rock which probably were associated with the limestone as originally placed.

This type occupies slopes, and much of it is too gullied or too steep for cultivation. The principal areas occur along the west side of Houlka Creek and between this stream and Chookatonkchie Creek. The total area of the type in this county is small, and probably not more than 15 per cent of it is cultivated. The soil, however, is very productive, and without fertilization average yields of 1 bale or more of cotton or 50 bushels of corn are obtained. These are practically the only crops grown.

The chief need in maintaining the productiveness of this soil is to prevent erosion by terracing, keeping up the organic-matter supply, plowing deep, and using the steeper slopes only for such crops as

melilotus and Bermuda grass for hay or pasturage. Melilotus does well on this soil.

RUSTON SANDY LOAM.

The Ruston sandy loam consists of a grayish loamy sand or sandy loam, underlain at about 5 inches by a reddish sandy loam which passes abruptly at 8 to 15 inches into dull-red friable sandy clay. In places there are some included areas of coarse sandy loam. The slopes are largely gullied, and the sandy covering has been so washed away as to leave only a thin veneer or has been entirely removed. The boundary between such washed areas and the Ruston clay loam is sometimes difficult to establish. The type includes some small patches of Orangeburg sandy loam and fine sandy loam. Owing to its friable nature, the soil is easily cultivated.

The largest area of this soil is that around Salem Church. Other smaller areas are mapped near Shiloh and Friendship Churches and west of Coleville. The surface is rolling and the drainage is good.

This type is fairly extensive and probably somewhat over one-half of it is under cultivation. Cotton is the principal crop. Some corn is grown for use on the farm. Cotton yields about one-fourth to one-half bale per acre, under the prevailing methods of farming, and corn about 15 to 20 bushels per acre. Few leguminous crops are grown, and little organic matter is turned into the soil.

This land has an average value of about \$10 an acre.

The Ruston sandy loam may be greatly improved by growing leguminous crops at frequent intervals, to be cut for hay or plowed under. Cowpeas, soy beans, bur clover, hairy vetch, and crimson clover will succeed. By the addition of organic matter crop yields can be largely increased. By fertilizing or manuring moderately and with proper preparation of the seed bed and good cultivation, acreage yields of at least one-half bale of cotton and 30 bushels of corn should be obtained. The type produces three-fourths bale of cotton per acre in many parts of the South when in a high state of cultivation.

Stock, both hogs and cattle, could be raised successfully. The ground is not injured by grazing, and a large number of good forage crops, including peanuts, sorghum, cowpeas, and soy beans, can be grown successfully. Bermuda grass does well and furnishes good pasturage.

RUSTON FINE SANDY LOAM.

The Ruston fine sandy loam consists of a grayish loamy fine sand to fine sandy loam, underlain at about 5 inches by yellowish to reddish fine sandy loam which passes abruptly at about 8 to 15 inches into dull-red or yellowish-red, moderately friable clay. The clay

either extends to a depth of 3 feet or more without important change in structure or color, or becomes somewhat more friable and more yellowish in the lower part. When wet the subsoil is somewhat plastic. On the knolls and ridges ferruginous gravel is common in the subsoil. The slopes wash readily, and in places are gullied or denuded of the sandy covering, but this land does not wash so badly as the Ruston clay loam. There are included patches of the Orangeburg fine sandy loam.

The Ruston fine sandy loam occurs chiefly in the southern part of the county, north of Topisaw Creek, east of Sparta, and between Chico and Long Creeks. Several large areas are also found in the northern part of the county, north of Van Vleet. The surface is characteristically rolling and drainage is well established.

The type is moderately extensive and of considerable agricultural importance. Probably 60 per cent of it is cultivated. Cotton is the main crop. It is grown almost to the exclusion of other crops, some corn and oats being grown for the work stock.

The acreage value of land of this type is about the same as that of the Ruston sandy loam.

The soil is suited to the same crops as the Ruston sandy loam, and requires about the same treatment. Yields are probably somewhat higher than those obtained on the sandy loam with the same fertilization and cultural treatment.

#### RUSTON CLAY LOAM.

The Ruston clay loam as mapped in this county consists of undifferentiated Ruston fine sandy loam, Ruston clay loam, Ruston clay, and Rough gullied land. The soil is prevailingly a grayish to reddish fine sandy loam, underlain at about 1 inch to 5 inches by dull-red or yellowish-red, moderately friable clay, possessing the same characteristics as the subsoil of the Ruston fine sandy loam. Ordinary deep plowing would bring to the surface enough clay to form, when mixed with the sandy covering, a sandy clay loam. On the knolls and ridges reddish and brownish ferruginous concretions are often abundant.

This soil apparently represents areas of Ruston fine sandy loam which under cultivation have been washed, owing to the rolling topography. A large part of the type represents gullied areas too rough to cultivate, and freshly exposed, unproductive areas of clay, but these developments occur as scattered patches, which can not be shown satisfactorily on the soil map.

The principal areas of the Ruston clay loam are those northeast of Houston and east and northeast of Houlka. The type is used chiefly for pasture or is lying idle. Some smooth patches are used for growing cotton. The more nearly level ridge crests and gentler

slopes can be safely cultivated, but generally the slope is too steep for safe cultivation without terracing. The type is of little importance in its present condition, and its chief value seems to be for cattle raising.

Unless steps are taken to check erosion the entire area of this type undoubtedly will be converted in time into Rough gullied land. Obviously the best means of preventing erosion is either to allow the land to grow up in old-field pine or to establish a sod of some soil-building crop, such as Bermuda grass. In the latter case the land could be used for pasture.

#### ORANGEBURG FINE SANDY LOAM.

The typical Orangeburg fine sandy loam consists of a grayish, loamy fine sand to fine sandy loam, which passes abruptly into yellowish or reddish fine sandy loam. This is underlain at about 8 to 12 or 15 inches by red, friable fine sandy clay, showing little change within the 3-foot section. Many patches of this soil, on account of their small size, are included with other types, especially with the Ruston clay loam and fine sandy loam. This type includes patches of the Greenville clay loam.

The principal areas of the Orangeburg fine sandy loam are encountered in the vicinity of Parkersburg and Weselys Chapel. Smaller areas are found near Old Houlka and in other parts of the county. The surface is prevailingly rolling, with many steep slopes on which gullied areas have been formed. The type has good internal drainage. The surface drainage is good to excessive, the rapid run-off causing ruinous washing on the steeper slopes.

The type is not extensive, but probably 50 per cent of it is under cultivation, the remainder being forested with pine, oak, and hickory, and some chestnut. The cultivated areas are used chiefly for cotton. Corn, cowpeas, and peanuts are grown in a small way for feed and forage.

With moderate fertilization or manuring good yields are obtained, and fairly good yields are produced where the productiveness has been maintained by growing the legumes in rotation with other crops.

The light teams and tools used on this type are adequate for efficient tillage, as the soil is friable and is very easily cultivated.

This type in the smooth areas is valued at about \$20 an acre.

The steeper slopes of this type are not suited to cultivation, and should be used either for woodlots and seeded to soil-binding crops, such as Bermuda grass and Johnson grass and utilized as pastures. Contour cultivation should be practiced on all the slopes. In some cases terracing is needed to prevent erosion.

This soil in various parts of the South is successfully used for the production of peaches. Other crops which have proved successful elsewhere are Irish potatoes, sweet potatoes, sorghum, cowpeas for hay and grain, bur clover, crimson clover, vetch, and oats.

GREENVILLE CLAY LOAM.

The Greenville clay loam consists of a brown to reddish-brown silty clay loam to clay loam, underlain at about 5 or 6 inches by red, friable clay. In places there is a thin covering of fine sandy loam. Deep plowing would convert the surface soil in all places into a clay loam by bringing up clay from beneath.

This soil occurs mainly south of Old Houlka. The surface is level or undulating, and the type has good drainage. It is not very important agriculturally, being of small extent in this county. The type is easily tilled, and most of it is under cultivation. Cotton is the chief crop, with some corn and oats grown. Good yields are obtained, cotton producing 1 bale per acre, with light applications of fertilizer or manure. Corn yields upward of 50 bushels per acre in good seasons. The corn is used for feeding work stock and hogs and for making corn meal for home use.

Among the crops which do well but are not extensively grown are peaches, the various legumes which succeed in this region, and sorghum. Recently some wheat has been grown, with good results.

Moderately heavy teams are used on the soil to effect thorough cultivation.

TRINITY CLAY.

The Trinity clay typically consists of a dark-brown to black clay which shows little change in the 3-foot section, except that the lower part often has a dark yellowish brown color. There are included areas of yellowish-brown and dark-brown clay and some strips of a silty to somewhat sandy character. Some included areas near bluffs on which the chalk (Houston material) occurs have an overwash of whitish material 1 or 2 inches in thickness. Such areas represent an approach to the Catalpa clay.

This type occurs in the first bottoms of streams in the eastern part of the county. The principal areas are those along Tallabinnela, Sugar Run, Mattubby, Red Bud, Culley, and Chookatonkchie Creeks. It is subject to overflow except along Tallabinnela and Chookatonkchie Creeks, which have been canalled sufficiently to prevent overflows, at least under normal conditions. Some deep ditches, constructed before the Civil War, prevent overflows in some areas along the other streams. The surface is flat. Tile drains have been installed in some fields and have materially improved the under-drainage.

The Trinity clay is an important soil. Practically all of it is under cultivation. Corn and cotton are the principal crops. Corn

yields 60 to 75 bushels per acre. In the absence of excessive moisture and of injury by the boll weevil, and without manurial treatment, cotton yields 1 bale per acre. Some alfalfa is grown. This is not an important crop as yet, but the results indicate that with proper drainage the type is an excellent alfalfa soil. Large areas are used for the production of Johnson-grass hay. Cotton and hay are the money crops, although some corn is sold at local markets. Some of the hay and corn is fed to the cattle raised on the associated uplands.

The Trinity clay is a very productive soil. It has produced heavy yields of corn and cotton continuously for more than 50 years without the addition of fertilizer, and these long used fields still produce yields as good as ever, even showing increased yields where the drainage has been improved by canalling. Cotton, however, is sometimes damaged by the boll weevil.

The value of the land over the greater part of this type ranges from \$50 to \$75 an acre, depending on the improvements.

The type of farming now carried on and the methods used are well suited to this soil. Work stock, cattle, and hogs could be raised successfully. It is not certain that a change to stock raising would prove more profitable than the present system of farming, but with increased alfalfa production it is believed that hog raising could be extended with profit. Various forage crops, such as sweet clover, cowpeas, alfalfa, and sorghum, do well.

#### HANNAHATCHEE FINE SANDY LOAM.

The Hannahatchee fine sandy loam consists of a reddish-brown to dark reddish brown fine sandy loam or heavy fine sandy loam, underlain at about 6 to 8 inches by mottled drab and rusty-brown or yellowish-brown loam or silt loam to silty clay loam. In places, thin strata of sandy material are present at variable depths in the subsoil. This type as mapped includes some Hannahatchee loam and silty clay loam and Ochlockonee fine sandy loam and loam.

The principal areas of the type are those in the southwestern part of the county along Topisaw and Bear Creeks. Smaller strips occur along many of the smaller streams, mainly near the headwaters rising in or flowing through areas of the Orangeburg and Greenville soils. The type occurs as level areas in the first bottoms of streams and is subject to overflow except where it has been canalled. It has good drainage between overflows.

This type is of considerable importance in the agriculture of the county. The principal crops grown are corn and cotton. Cotton was most extensively grown until the advent of the boll weevil; since that time corn has ranked first in point of acreage. A part of

the corn is used on the farms, and the remainder is sold at local markets.

Without manurial treatment corn yields about 25 to 50 bushels per acre, and cotton about one-half to three-fourths bale. Frequently yields of 1 bale of cotton per acre were obtained before the boll weevil became troublesome.

This land seems well adapted to its present uses. Results obtained in small patches of cowpeas, oats, and sorghum show that the soil is well suited to these crops. In preparing the land for crops and in cultivating, thorough tillage is effected with light teams and tools.

The present value of this land in the canalled bottoms averages about \$45 an acre. Other areas have a considerably lower value.

After several years of cultivation the depth of breaking, which operation probably should be done in the fall, should be increased gradually. A plow depth of 10 inches or more eventually should be reached. Such deep plowing, of course, will require heavier implements and teams than those now used. More cowpeas probably should be grown in rotation with corn and cotton, to keep up the supply of organic matter in the soil.

Forage crops do well, and cattle could be raised successfully. Hogs could be fattened on corn and peanuts, which can be grown successfully, but it is not certain that stock raising would prove more profitable than the present type of general farming.

#### HANNAHATCHEE SILTY CLAY LOAM.

The Hannahatchee silty clay loam consists of a reddish-brown to chocolate-brown silty clay loam, which passes at about 5 to 8 inches into dark-brown silty clay loam containing in places some black concretionary material, and often showing rusty-brown mottlings. This grades below into a mottled drab and rusty-brown or yellowish-brown, rather plastic silty clay. In places there is some wash from the Sumter clay. The type as mapped includes some Ochlockonee fine sandy loam, loam, and silt loam. The natural vegetation consists in part of sweet gum, black gum, oak, hickory, and switch cane.

The main areas of this soil occur in the first bottoms of Houlka and Chookatonkchie Creeks. The surface is level and the drainage good, the areas being canalled. This is one of the most important bottom soils in the county. Practically all the type is cultivated.

Corn and cotton are the principal crops. Both yield well, corn producing upward of 75 bushels an acre and cotton 1 bale or more, where not injured by the boll weevil. The corn is used at home and sold locally. No stock raising or dairying is practiced. Cowpeas, Johnson grass, sorghum, and melilotus are grown in a small way, and the results indicate that the type is well suited to these crops.

Two-horse plows are used in breaking this land and one-horse plows for cultivation. The soil is easily worked up into a good

tilth and although some clods are formed they break down readily. The soil does not compact like the Ochlockonee silty clay loam, and a lighter equipment of teams and implements is ample for efficient seed-bed preparation.

This type has an average land value of about \$50 an acre. Some of it is held for about \$75 an acre.

This soil seems well suited to the purpose for which it is used and to the present methods of farming. It produces heavy yields for long periods without manuring.

#### OCHLOCKONEE SILT LOAM.

The Ochlockonee silt loam consists of a brown, mellow silt loam, passing abruptly into lighter brown loam to silty clay loam, with frequently some rusty-brown mottling. In places there is comparatively little change in the subsoil to a depth of 3 feet, but in other places there is considerable variation, both in color and in texture. Strata of sandy material are not uncommon throughout the 3-foot section in some bottoms, and there are places where the lower subsoil is a plastic silty clay mottled drab, yellowish, and brownish.

The Ochlockonee silt loam occurs chiefly along the headwaters of Yallabushah, Houlka, Fourmile, and Chico Creeks, and Balls Branch. Areas of less importance are mapped in other parts of the county. The type occurs in the first bottoms of streams as level areas subject to overflow. Along Yallabushah Creek it has been canalled and is not overflowed under normal conditions. Drainage is fair to good. Those areas with a mottled subsoil probably would be benefited by tiling.

Probably 60 per cent of this type is under cultivation. It is a productive soil and the type is of considerable importance agriculturally. A part of it is forested, chiefly with willow oak, water oak, overcup oak, sweet gum, hickory, ironwood, and beech.

The principal crops grown are corn and cotton. Corn yields 30 to 60 bushels or more per acre. Cotton produces upward of 1 bale per acre where not severely damaged by the boll weevil. Some Johnson-grass and cowpea hay are produced. These crops yield about 1 ton to 3 tons per acre. No stock is raised on this type, but some of the hay and corn produced is fed to cattle raised on the adjoining uplands. A wide variety of good forage crops do well, and cattle could be raised with success.

Two-horse plows are used for breaking and one-horse plows for cultivating this land.

The type is well suited to the system of farming practiced and the present methods of cultivation. No fertilizers are used and little attention is paid to rotation, yet good yields are generally obtained in favorable seasons.

This land is valued at about \$25 to \$40 an acre, according to location with respect to improved highways and railroads, and depending upon whether it has been canalled.

#### OCHLOCKONEE SILTY CLAY LOAM.

The Ochlockonee silty clay loam typically consists of a brown silty clay loam, underlain at about 5 or 6 inches by lighter brown or yellowish-brown, plastic silty clay, slightly mottled with gray or drab and rusty brown. The color becomes lighter and the structure denser with increased depth, the lower part of the subsoil usually being a mottled drab and brownish or yellowish, plastic clay. Some included areas are quite grayish or mottled grayish and brownish at the surface and conspicuously mottled below. The lighter colored soil represents inclusions of either the Bibb silty clay loam or a type intermediate between typical Ochlockonee and Bibb.

The principal areas of the type are those along Yallabushah, Mud, Scoona, Indian, Cane, Chico, Long, and Chookatonkchie Creeks. The type occupies the first bottoms of streams, and where not canalled is subject to overflows. The greater part is canalled. The drainage apparently is good in normal seasons, but tiling probably would be beneficial, especially in wet years. The forest growth is practically the same as that on the Ochlockonee silt loam.

The type has a total area of 33.9 square miles, and upwards of 40 per cent of the land is under cultivation. It is a productive soil and is of considerable importance in this county. It is used for corn and cotton; probably more corn than cotton is grown. The yields are about the same as on the Ochlockonee silt loam. Heavier teams are required for efficient breaking of the land than on the silt loam, three and four horse plows generally being used. The soil clods more readily and cultivation is restricted to a somewhat narrower range of moisture conditions than in the case of the silt loam.

The present value of land of this type ranges from about \$15 an acre for cut-over land to \$65 an acre for canalled land near the improved highways.

Johnson grass, Bermuda, lespedeza, and sweet clover probably could be made profitable hay crops. However, the type of farming now practiced seems very well suited to the soil.

#### CAHABA FINE SANDY LOAM.

The surface soil of the Cahaba fine sandy loam is a light-brown to yellowish-brown fine sandy loam, passing into pale-yellowish fine sandy loam. This is underlain at about 6 to 12 inches by dull-red to reddish-yellow, moderately friable fine sandy clay. The reddish color of the subsoil is very uniform and there is little mottling.

The Cahaba fine sandy loam is of small extent in this county. The largest areas are those between Tallabinnela and Willgo Creek and on

the east side of Chookatonkchie Creek. Other small patches occur elsewhere. The type occurs as narrow strips on stream terraces near the bluff along the first bottom, where the drainage is better than on the terraces farther back from the bluff. The drainage is good.

Most of this type is under cultivation, the principal crops being cotton and corn. It responds readily to applications of fertilizer and manure, and also is easily improved by growing the legumes in rotation with other crops. Oats, cowpeas, peanuts, Irish potatoes, and sweet potatoes do well, but are grown only in a small way.

#### MYATT FINE SANDY LOAM.

The Myatt fine sandy loam consists of a gray fine sandy loam, which passes at about 5 inches into light-gray fine sandy loam mottled with yellowish. The subsoil, beginning at a depth of about 10 to 20 inches, is a mottled drab and yellowish plastic sandy clay or clay. Dark-colored concretionary material is common in the subsoil. In places the subsoil is quite bluish in color. There are some included patches of Cahaba and Kalmia soils too small to map separately.

The Myatt fine sandy loam is encountered in small, scattered areas in different parts of the county. It occupies distinct stream terraces. The surface is characteristically level, and on this account, as well as on account of the impervious subsoil, the drainage is poor.

The total area of this type is small, and owing to its small extent and low productiveness, it is not an important soil in this county. A part of the type is farmed, but crop yields are poor. The soil seems best suited to lespedeza and native grasses. The forest growth consists mainly of sweet gum, water oak, white oak, and hickory.

#### ROUGH GULLIED LAND.

The areas mapped as Rough gullied land consist of slope land washed and gullied by erosion to such an extent as to preclude its use for farming. The material of the small included areas which have not been severely eroded consists mainly of Orangeburg soils. Most of the surface material is freshly exposed clay. Many of the gullies are quite deep, some are V-shaped, while others have almost perpendicular walls to a depth of 20 to 50 feet.

The Rough gullied land is confined almost entirely to the Pontotoc Ridge. Areas are mapped northeast of Parkersburg and west and northwest of Friendship Church. In some areas, where the gullies are not too deep, the erosion may be checked by filling the gullies with brush, then damming them up at intervals, and seeding the slopes to lespedeza and Bermuda grass. Black locust, honeysuckle, old-field pine, and plum are considered valuable plants for reclaiming such badly washed land.

## SUMMARY.

Chickasaw County is in the Coastal Plain in the northeastern part of Mississippi. It has an area of 501 square miles, or 320,640 acres.

The uplands comprise over three-fourths the area. There are broad bottoms along the larger streams.

The topography ranges from level or undulating to rolling or hilly. The elevation of the upland ranges from 250 to 500 feet above sea level.

Pontotoc Ridge, passing through the center of the county, forms an important drainage divide. The streams on the west eventually reach the Mississippi River and those on the east flow into the Tombigbee River. Except in the Flatwoods section, the drainage system of the county is well developed. The streams are sluggish and the valleys are comparatively shallow.

Chickasaw County was first settled in the early thirties. The population in 1910 was 22,846. There are two county seats—Okolona and Houston. The former is the largest town in the county, with a population of about 2,600. Houston ranks next in importance among the towns of the county, with a population of about 1,400.

Good transportation facilities are furnished by the New Orleans, Mobile & Chicago Railroad; the Mobile & Ohio Railroad; and a branch of this road running west to Calhoun City. In general the public roads formerly were in poor condition. They are being improved however, 50 or 60 miles of improved roads having recently been constructed in the vicinity of Okolona and Houston.

The climate is characterized by mild winters, long, warm summers, and ample rainfall.

The agriculture of the county consists mainly of the production of cotton as the money crop, with corn chiefly for feed. Hay and forage crops are grown to some extent. Increasing interest is taken in the raising of cattle, and hog raising is of some importance.

Somewhat over 76 per cent of the land area of the county is in farms, and of the farm land 53.3 per cent is improved. Counting each tenancy as a farm there are 3,474 farms in the county. Owners operate 32 per cent of the farms and tenants practically all the remainder.

Farm land ranges in value from about \$5 to \$75 an acre, depending on the soil, farm improvements, and location. The average land value is reported in the census of 1910 as \$14.17 an acre.

In Chickasaw County 25 soil types, including Chalk (Houston material) and Rough gullied land, are mapped, representing 14 series.

The principal upland soils are the Houston clay, Oktibbeha clay, Lufkin silt loam and clay, Pheba silt loam, Ruston fine sandy loam and clay loam, and the Greenville clay loam. The main bottom-land types are the Trinity clay, Hannahatchee silty clay loam, and the Ochlockonee silt loam and silty clay loam.

The Houston clay is a brownish clay of high lime content, occupying level and gently rolling prairie areas. It is mainly well drained and works into a good tilth. It is well adapted to alfalfa, melilotus, Johnson grass, and cotton, and to the raising of beef cattle and hogs.

The Oktibbeha clay includes the reddish-brown clay locally known as "post-oak land." It has good drainage on the slopes, but the surface drainage in the level areas is poor. It is a fair cotton soil and is well suited to grass, melilotus, lespedeza, cowpeas, and soy beans.

The Lufkin silt loam and clay are level, poorly drained, grayish soils with impervious clay subsoils, occurring in the flatwoods. These soils are difficult to keep in a good condition of tilth and are of comparatively low productiveness. The silt loam is used to some extent for cotton and corn, giving fair yields in years of normal, evenly distributed rainfall. These soils are used successfully in southwestern Arkansas for rice.

The Pheba silt loam consists of a brownish, mellow silt loam surface soil with a mottled, compact, hardpanlike subsoil. It works up easily and the surface soil is well drained except in the level areas. Where the type is properly supplied with organic matter, cotton, corn, and various forage crops, including peanuts and lespedeza, do well. Stock could be raised successfully on this type.

The Ruston fine sandy loam and clay loam are rolling, well-drained soils of the Pontotoc Ridge. Both are washed and gullied on the steep slopes, and these areas should be devoted to soil-binding crops such as grass and lespedeza. Cotton and corn, the chief crops grown, do fairly well on the better areas. A large part of these types could best be used for raising beef cattle.

The Greenville clay loam is a better soil of the Pontotoc Ridge. It is well drained and productive, giving good results with cotton, corn, oats, wheat, and the various forage crops common to the region.

The Trinity clay consists of a black or nearly black clay, which is very sticky when wet but crumbles on drying. It occurs in the first bottoms of streams and is mainly under cultivation, giving heavy yields of cotton, corn, alfalfa, melilotus, and Johnson grass.

The Hannahatchee silty clay loam is a reddish-brown to chocolate-brown first-bottom soil. It is mainly under cultivation. It is easily worked into a good seed bed and produces heavy yields of cotton, corn, sorghum, cowpeas, oats, and Johnson grass.

The Ochlockonee silt loam and silty clay loam are brown soils of the first bottoms. The silt loam is easily tilled, but the silty clay loam is inclined to clod and requires heavier teams for efficient cultivation. Both soils are productive and largely farmed. Corn and cotton are the chief crops grown.

[PUBLIC RESOLUTION—No. 9.]

**JOINT RESOLUTION** Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

*Resolved by the Senate and House of Representatives of the United States of America in Congress assembled,* That public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, be amended by striking out all after the resolving clause and inserting in lieu thereof the following:

That there shall be printed ten thousand five hundred copies of the report on field operations of the Division of Soils, Department of Agriculture, of which one thousand five hundred copies shall be for the use of the Senate, three thousand copies for the use of the House of Representatives, and six thousand copies for the use of the Department of Agriculture: *Provided*, That in addition to the number of copies above provided for there shall be printed, as soon as the manuscript can be prepared, with the necessary maps and illustrations to accompany it, a report on each area surveyed, in the form of advance sheets, bound in paper covers, of which five hundred copies shall be for the use of each Senator from the State, two thousand copies for the use of each Representative for the congressional district or districts in which the survey is made, and one thousand copies for the use of the Department of Agriculture.

Approved, March 14, 1904.

[On July 1, 1901, the Division of Soils was reorganized as the Bureau of Soils.]

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