U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

IN COOPERATION WITH THE STATE OF MISSISSIPPI; THEODORE G. BILBO, GOVERNOR; E. N. LOWE, DIRECTOR STATE GEOLOGICAL SURVEY.

SOIL SURVEY OF LEE COUNTY, MISSISSIPPI.

BY

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

HUGH H. BENNETT, INSPECTOR, SOUTHERN DIVISION.

[Advance Sheets—Field Operations of the Bureau of Soils, 1916.]

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1918.

BUREAU OF SOILS.

MILTON WHITNEY, *Chief of Bureau.*
ALBERT G. RICE, *Chief Clerk.*

SOIL SURVEY.

CURTIS F. MARBUT, *In Charge.*
G. W. BAUMANN, *Executive Assistant.*

COMMITTEE ON THE CORRELATION AND CLASSIFICATION OF SOILS.

CURTIS F. MARBUT, *Chairman.*
HUGH H. BENNETT, Inspector, Southern Division.
W. EDWARD HEARN, Inspector, Southern Division.
THOMAS D. RICE, Inspector, Northern Division.
W. E. MCLENDON, Inspector, Northern Division.
MACY H. LAPHAM, Inspector, Western Division.
J. W. MCKERICHER, *Secretary.*

U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

IN COOPERATION WITH THE STATE OF MISSISSIPPI; THEODORE G. BILBO, GOVERNOR; E. N. LOWE, DIRECTOR STATE GEOLOGICAL SURVEY.

SOIL SURVEY OF LEE COUNTY, MISSISSIPPI.

BY

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

HUGH H. BENNETT, INSPECTOR, SOUTHERN DIVISION.

[Advance Sheets—Field Operations of the Bureau of Soils, 1916.]

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1918.

LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., May 26, 1917.

SIR: In the extension of the soil survey in the State of Mississippi during the field season of 1916, a survey was undertaken in Lee County. This work was done in cooperation with the Mississippi Geological Survey, and the selection was made after conference with State officials.

I have the honor to transmit herewith the manuscript report and map covering this work and to request their publication as advance sheets of Field Operations of the Bureau of Soils for 1916, as authorized by law.

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

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

CONTENTS.

ILLUSTRATIONS.

FIGURE.

MAP.

SOIL SURVEY OF LEE COUNTY, MISSISSIPPI.

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

DESCRIPTION OF THE AREA.

Lee County is situated near the northeastern corner of Mississippi. It is bounded on the north by Prentiss County, on the east by Prentiss and Itawamba Counties, on the south by Monroe and Chickasaw Counties, and on the west by Pontotoc and Union Counties. It approaches a rectangle in outline, with dimensions of about 30 miles from north to south and 16 miles from east to west. It embraces an area of 448 square miles, or 286,720 acres.

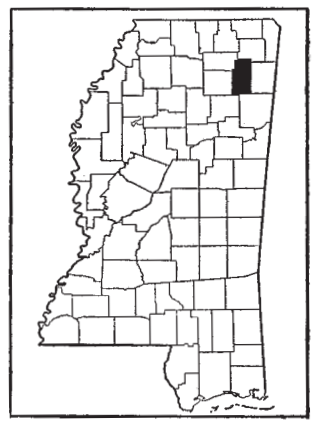


FIG. 1.—Sketch map showing location of the Lee County area, Miss.

The included country in general consists of rather low divides, separated by comparatively wide, flat valleys. Practically all the slopes are smooth, and the relief seldom exceeds 100 feet. Throughout the western half of the county the uplands generally are undulating to rolling, and the numerous valleys are remarkably wide, considering the size of the streams. On the west and southwest sides of the larger valleys in many places the slopes are blufflike or the uplands are quite hilly for a fraction of a mile from the streams. The greater part of the uplands, however, consists of evenly rounded ridges, with long, gentle southern slopes ending in the wide terraces that so generally border the larger valleys on the north.

In the eastern half of the county the topography is more varied. The uplands of the extreme northeastern part slope gradually toward the south and merge in the high, undulating terraces north of Twentymile Creek. Immediately south of the latter stream the hills rise abruptly about 100 feet. This margin of the uplands is very broken, but the average width of this rough belt is hardly one-half mile. From its crest southward to Mantachie Creek the surface is generally rolling to moderately hilly.

A similar succession of valleys, short north-facing slopes, and long southern slopes occurs in the country crossed by Patch and Puncheon Creeks, as well as in the southeastern part of the county, where some of the minor streams have a southwest course. Immediately south of each of the latter streams the uplands are much rougher than to the north, but only a small proportion of the land is untillable. Most of the land drained by north-flowing branches of Patch and Puncheon Creeks is too broken to admit of cultivation.

In the central part of the county, from Old Town Creek eastward to Eggville and Mooreville, and as far south as Plantersville, much of the country is very hilly. The elevation above sea level is 252 feet at Nettleton and 414 feet at Baldwyn.

The regional drainage of Lee County is toward the southeast. The local drainage is mainly south and southeast, but the drainage of the rougher lands is generally toward the north. The alluvial bottoms along the streams are comparatively wide.

Artesian wells are numerous in the lowlands of the southern part of the county, but do not occur in the northern creek bottoms or in the uplands. Excellent water is obtainable by drilling through the Selma Chalk formation which in the western part of the county is about 600 feet and in the eastern part less than 200 feet thick. Shallow wells generally are unsatisfactory, particularly in the areas of limy soils.

The area embraced in Lee County was first settled about 1830. Lee County was formed from parts of Pontotoc and Itawamba Counties in 1867. The 1910 census reports the population of the county as 28,894, of which 18,220 are white and 10,667 colored. Most of the whites are native Americans. More than 86 per cent of the population is classed as rural.

Tupelo, which in 1910 had a population of 3,881, is the county seat and commercial center. The next largest towns are Baldwyn, with a population of 787; Nettleton, with 733;[1] Shannon, with 564; and Verona, with 558. All the other settlements have populations of less than 500.

Two railroads traverse the county, the Mobile & Ohio north and south and the St. Louis & San Francisco northwest and southeast.

A good system of surface roads radiates from Tupelo, and similar roads are being built in other sections. Most of the county has rural mail-delivery and telephone service.

CLIMATE.

The climate of Lee County is characterized by rather long hot summers and comparatively short mild winters. A high relative hu-

[1] Baldwyn lies partly in Prentiss County, and Nettleton partly in Monroe County. The proportion of the population of each in Lee County is about one-half.

midity makes the heat oppressive at times. The mean annual temperature is 61.7° F., the winter and summer means being, respectively, 44.2° and 78.1°. The highest temperature recorded is 105°, in July, and the lowest, —11°, in February. Extremes even approaching this are rare. Temperature and general weather conditions are most agreeable in April, May, October, and November, when the nights are cool and the days are warm and pleasant.

The average annual precipitation amounts to 47.95 inches and is rather evenly distributed. March is the wettest month, with an average precipitation of 6.01 inches, and October the driest, with an average of 1.58 inches. Thunderstorms may occur in any month, but are most common in July and August. They are generally moderate and are seldom accompanied by hail. There are occasional periods of protracted drought, but crops on well-prepared land seldom suffer from lack of moisture. More frequently injury to crops and inconvenience in caring for them is occasioned by excessive precipitation. Snow falls occasionally. There is commonly much cloudy weather in winter.

The average date of the last killing frost in spring is March 28, and that of the first in the fall, October 28. The dates of the latest recorded killing frost in spring and of the earliest in fall are April 17 and October 9, respectively. The average length of the growing season is about seven months. Usually spring work is well begun by March 1, and cotton and corn may be planted early in April.

The following table gives the normal monthly, seasonal, and annual temperature and precipitation as recorded at the Weather Bureau station at Pontotoc, about 30 miles west of Tupelo. These records closely represent the climatic conditions in Lee 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

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

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.
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.

All the uplands in Lee County originally supported an open forest of hardwoods, while the creek bottoms were mostly swamps, heavily forested and with much undergrowth of tall cane. Agricultural development was slow, but by 1860 most of the second-bottom land and much of the smoother upland area were in cultivation. In these sections a considerable number of large plantations were operated, while in the more hilly sections the land holdings generally were small. Cotton was the principal crop. Memphis was the chief market, but much of the cotton was hauled to points on the Tombigbee River and shipped to northern markets.

After the Civil War much of the upland fell out of cultivation. Lack of labor, the impaired productiveness of many of the upland fields, and the increase in the area of alluvial soils reclaimed by individual owners were the chief causes of this shift of agriculture toward the lowlands. The movement has been accelerated in the last 10 or 20 years by cooperative efforts in the reclamation of the wide creek bottoms, and now all of the rich alluvial land, with the exception of perhaps a few thousand acres, either is in cultivation or is being cleared. Ditches have been dredged, and much tile drainage is being installed. The alluvial soils are remarkably productive, and a large proportion of the cotton and corn produced in the county is grown on them. The general trend of agriculture during the last 40 years is indicated in the following table compiled from the census returns:

Acreage and production of the four leading crops from 1880 to 1910, inclusive.

Year.	Cotton.		Corn.		Oats.		Wheat.	
	Acres.	*Bales.*	*Acres.*	*Bushels.*	*Acres.*	*Bushels.*	*Acres.*	*Bushels.*
1880	38,578	14,406	36,073	590,899	4,676	48,047	1,400	7,387
1890	37,561	7,082	31,417	460,973	2,213	18,839	26	185
1900	38,725	16,471	43,876	973,240	1,411	16,690	144	860
1910	60,320	20,744	40,452	635,343	501	7,011	.....	.....

In the last few years the production of cotton has ranged from about 21,000 to about 31,000 500-pound bales per annum. There has been a greater proportional increase in the acreage than in the production of this crop. The boll weevil, which first made its appearance in the county about three years ago and in 1915 destroyed practically all the late cotton, has been instrumental in checking the increase in the production of this crop. At the same time there has been an increase in the area devoted to corn. This is partly due to the prevailing high price of the grain and to the excellent yields obtained on most of the alluvial soils. With some farmers on these soils corn is now a cash crop of importance.

The acreage of oats has increased in recent years but is still comparatively small. The crop is chiefly used for forage. A very few small fields of wheat were sown in 1915. Both these cereals can be profitably grown on the productive soils.

The 1910 census reports 1,076 acres in tame or cultivated grasses, producing 1,893 tons of hay, and 424 acres in wild grasses, from which 624 tons of hay were obtained. Coarse forage was cut in 1909 from 512 acres, with a production of 678 tons, and grains were cut green from 2,536 acres, producing 2,605 tons.

Alfalfa is an established crop. There are only a few large fields, but many small patches of 2 to 5 acres. From two to five cuttings are obtained in a season, the first cutting usually being made about May 10. The maximum yield per acre per cutting is about 1 ton. Considerable care is required in handling this crop in order to get hay of marketable quality. The feeding value of the hay is high, however, even when the color is somewhat altered by rain or other causes.

There is not much lespedeza hay made, although lespedeza and white clover are abundant almost everywhere in yards and pastures and on roadsides. Melilotus, which grows luxuriantly on all the limy soils, is utilized only for pasturage. Johnson grass has established itself on many of the calcareous soils and Bermuda grass grows on all the open lands. Bur clover and occasional patches of red clover are seen on the more calcareous soils. There is also much

"hop clover," while vetches and other legumes are quite common. Crimson clover, soy beans, and a variety of velvet beans which matures its seed have been grown experimentally, and the results indicate that these may be profitably grown as forage crops. Sorghum is quite extensively grown for the sirup as well as for fodder.

All the minor crops common to this section of the South are easily grown, but there has been no development of trucking or fruit growing on a commercial scale. Many farmers have a few peach trees, which bear abundantly in most years. There are a good many apple trees on the farms, but they are mostly of summer and early-fall varieties and seem to bear irregularly.

Most of the resident landowners have at least a few cattle and some have a considerable number, but the majority of the tenants have no live stock other than the work stock, a few hogs, and a cow or two. There has been much improved stock imported in recent years. Only a few farmers raise hogs in sufficient numbers to make an occasional car-lot shipment. About 20 carloads of hogs were shipped from Tupelo and a few carloads from each of the other railroad towns in 1915.

Very few sheep are now raised, but it is said that prior to the enactment of the law prohibiting stock from running at large many small flocks ranged on the rougher lands.

Dairying is of local importance near Tupelo and Verona, but only a few farmers in other parts of the county produce milk or cream in marketable quantities.

The census reports 1,443 calves, 4,138 other cattle, 10,902 hogs, and 68 sheep and goats sold or slaughtered in 1909. The value of all animals sold or slaughtered in that year was $304,522.

The marked adaptation of the dark-colored soils of the stream bottoms to corn and of the limy soils to alfalfa is generally recognized by the farmers. Cotton is grown on all types of soil, and little attention has been given to selecting varieties with regard to their suitability to particular soils or soil conditions.

At present, owing to the prevalence of the boll weevil, earliness of maturity is the main consideration in determining the variety grown. The Ruston fine sandy loam is recognized as a good peach soil, while the Susquehanna soils are considered poorly suited to this fruit.

There is much improved farm machinery in use, mainly on the large farms, particularly those that are devoting attention chiefly to the production of corn, hay, and live stock. Most of the tenant farmers have light teams and implements. Many dipping vats have been built in accordance with a State law which makes the dipping of cattle compulsory. A large proportion of the county is now practically free from the cattle tick.

Agricultural practice is in a transitional stage. Many farmers, particularly those operating on reclaimed valley lands and on the Oktibbeha soils, "flat break" their corn and cotton land, and then make rather low, wide beds for planting. On areas having tile drainage corn is frequently planted on the flat surface and given shallow cultivation. Most of the tenant farmers and many landowners ridge the corn and cotton land without previous breaking and depend on subsequent cultivation with a 1-horse plow to keep the ground in good tilth. Much of the land so treated has a compact, hardpanlike stratum at a depth of a few inches as a result of long-continued shallow plowing. On the Myatt soils and over much of the area of the Lee soils it is considered necessary to ridge cotton ground to insure adequate surface drainage. Various modifications of these different methods of plowing and cultivating are practiced, but the opinion prevails that most of the upland soils are not plowed deep enough, nor given sufficient cultivation.

No systematic rotation of crops is practiced. Most farmers recognize the benefit to be derived by growing and occasionally turning under cowpeas or other legumes, but there is a very general neglect of the practice. This is largely due to the custom of leasing land for one year for the purpose of growing cotton. The growing of winter cover crops is neglected for the same reason.

Prior to 1915 a complete commercial fertilizer was generally used on the upland and terrace soils in applications of 150 to 200 pounds per acre. Since then the high price of fertilizer has caused many farmers to abandon its use entirely, while others use mixtures containing no potash. Phosphorus seems invariably to give good results on cotton land on the uplands and high second bottoms. Cottonseed meal or some other form of nitrogenous fertilizer usually causes a marked increase of yield on the soils of these divisions, as they all are deficient in organic matter. Potash formerly was very generally used on the Myatt and some of the Lee soils to prevent cotton rust or blight.

Practically all the farm laborers are negroes. Most of the laborers prefer share cropping and working by the day to employment by the season. Where employed by the season they usually receive from $10 to $12 a month, in addition to house rent and the use of a garden. Day laborers are paid from 75 cents to $1 a day, and cotton pickers about 75 cents per 100 pounds. Near the towns, where most of the negroes now live, labor is abundant, but on plantations some distance out it is very scarce.

According to the 1910 census, there are 5,302 farms in the county, of an average size of 49 acres.[1] The majority of the plantations are

[1] Each tenancy is classed as a farm by the census. The individual holding is much larger than this.

or moderate size, many of them containing from 100 to 300 acres. Near towns they are usually smaller. There are a few holdings exceeding 1,000 acres. The bottom lands of the larger streams are generally held in small tracts by the owners of the adjoining hill lands.

Many owners reside on their farms, working a part of the land themselves and renting the remainder. In some sections the proportion of white tenants to resident owners is from three to five of the former to one of the latter. As a rule the tenant houses are cheaply built and other improvements are very poor. The leases usually run for one year, and each winter there is much shifting of the rural population. The usual rent is one-third of the corn and one-fourth of the cotton. This applies to practically all kinds of land. There is little renting on a cash basis. Tenancy is increasing, the proportion of farms operated by owners having gradually fallen from 61.2 per cent in 1880 to 35.6 per cent in 1900 and 30.1 per cent in 1910.

The price of desirable farm land has advanced greatly in recent years. This is particularly true of farms along improved roads, especially if the land is adapted to the production of corn and alfalfa. Land that has been rendered unproductive and rough by long-continued cultivation, and rough, uncleared areas have not shared in this advance, and in some instances are sold at prices as low as $5 an acre.

SOILS.

Lee County is in the northern part of the Gulf Coastal Plain. The region is underlain by the Selma Chalk, a soft, impure, bluish-gray lime rock that weathers rapidly upon exposure. It contains about 33⅓ per cent of lime.[1] This rock is exposed in many places, and throughout considerable areas it is covered by only a thin layer of residual material, of which the rock itself has contributed the greater part. Its direct influence upon the soils would be greater were it not for the presence of a yellowish silty clay on most of the broader divides, termed in geological literature the Yellow Loam. In the eastern part of the county there are large areas whose surface formation consists of rather deeply weathered sands. These three formations, the Selma Chalk, the Yellow Loam, and the unconsolidated sands, constitute the parent material of all the soils of the county. Each gives rise to a group of upland soils, and all contribute to the alluvial soils in the valleys.

The exposures of the Selma Chalk on steep hillsides usually are deeply gullied, and the rock is somewhat fragmental in places to a depth of several feet. Where the topography favors the accumula-

[1] Miss. State Geol. Surv. Bul. No. 1, p. 47, Cement and Portland Cement Materials of Mississippi.

tion of the decomposition products of the rock, a heavy silty clay is developed. The reddish mottled Oktibbeha soils overlie the whitish to bluish or yellowish, highly calcareous Houston Chalk (rotten limestone), and characteristically there is a sharp line of contact between it and the very calcareous Oktibbeha material. Frequently the chalk is found in the 3-foot section, such areas being mapped as the shallow phase of the Oktibbeha clay. The principal Oktibbeha type is the clay. The Oktibbeha silt loam also is recognized in this county. The latter evidently owes its more silty texture to an admixture of the Yellow Loam material. In some areas the soil is sandy, owing to an admixture of coarser material with the clay. These areas are mapped as the Susquehanna fine sandy loam.

The origin of the Yellow Loam is not well understood. It has been described as a thin sheet of loess, and also as the product of an advanced stage in the secular weathering of the rocks lying beneath it.[1] It is thickest on the broadest divides and on the gentler slopes, and thinnest, or absent in places, on steep hillsides, where it has apparently been largely removed by erosion. The maximum depth of this material seems to be less than 10 feet. Its lime content is low. Characteristically it occurs as a brown silty surface layer over yellowish silty clay subsurface material, and a compact substratum which is more or less mottled. The Yellow Loam gives rise to the Pheba series, the members of which differ little except in texture of the surface soil. The Pheba fine sandy loam, silt loam, and clay loam are mapped in Lee County.

The sandy deposits previously mentioned have given rise to the Ruston and Orangeburg fine sandy loams, the only representatives of their series in this county. These series are characterized by the dull-red and red color, respectively, of the subsoils, and a lighter colored or less oxidized substratum, which usually consists of loose sand. These types are best developed on the crests of divides where the sand seems to be in place, but they also occur extensively on the slopes where the presence of the sand is due in part to creep and wash from higher levels and in part to a removal of finer interstitial materials by rain waters. On the tops of the broader divides and on the longer slopes the sandy material, as the surface formation, usually gives way to the Yellow Loam, with a consequent development of the Pheba soils. On the lower slopes there are some exposures of the Selma Chalk, and the soils are more or less affected by this formation. In all this hilly region there is much local variation in the soils, but the dominant type is mapped, the slight included variations being undifferentiated.

[1] Geol. Surv. Miss. Bul. 12, p. 98.

On the high terraces, which generally lie on the northern side of the larger valleys, the surface soil usually is a fine sandy loam with a yellowish silty to sandy subsoil and a somewhat compact substratum. This soil is mapped as the Kalmia fine sandy loam. On slight elevations, where better drainage and deeper aeration prevail, the Cahaba fine sandy loam is mapped. On flats where the drainage is poor the Myatt fine sandy loam and silt loam occur. These types have gray surface soils, with a mottled gray and yellow subsoil. The Myatt soils are most extensive on the low, sloping second bottoms of Old Town Creek and a few other streams. In close association with the heavy phase of the Myatt silt loam, on a terrace along the north side of Tubbalubba Creek, the Leaf silt loam is mapped.

In the wider bottoms, which formerly were little more than swamps, the surface soils are composed of materials laid down since the uplands have been cleared. These deposits consist chiefly of silt and clay, with comparatively little sand. Their distribution, owing to the flatness of the surface and the heavy forest cover, is generally quite uniform, and they average about 1 or 2 feet in depth. The surface soils are brown, and the subsoils light colored with considerable brownish mottling, due to the former imperfect drainage. These first-bottom soils are classed with the Catalpa series, the fine sandy loam, silt loam, and silty clay loam being mapped. The Catalpa series typically contains enough lime to cause the soil to effervesce with hydrochloric acid, or at least to flocculate on the surface, giving a granular structure peculiar to limy soils. As mapped in this area, considerable areas of Ochlockonee soils have been included with the Catalpa. Where the natural drainage has been somewhat better, the surface soils are brown to dark brown, and the subsoils are of some shade of brown or yellow with little grayish mottling, except in the lower part. These browner bottom soils are included in the Ochlockonee series, which is represented by three members, the fine sandy loam, silt loam, and clay. Their total area is less than that of the Catalpa series.

Each of these alluvial types has been influenced, at least locally, by wash from the innumerable exposures of the Selma Chalk. In places the surface soils are distinctly calcareous, but the subsoils have not been measurably affected by the lime. Where there is a large content of material from the chalk, the surface soils are dark brown to black, and granular, with dark, plastic subsoils. These areas are mapped as the Trinity silty clay loam. Trinity soils are typically calcareous.

Since the larger streams have been canalled, the floods are of shorter duration than formerly and are not so widespread, with a consequent decrease in deposition of the brown mud these waters

carry. The canals are increasing in capacity, so that future inundations will tend to decrease.

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

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Oktibbeha clay	5,440	17.0	Catalpa silt loam	9,472	3.3
Shallow phase	43,264		Susquehanna fine sandy loam	7,488	2.6
Ruston fine sandy loam	26,368	14.3	Myatt silt loam	3,392	1.4
Hilly phase	14,720		Heavy phase	512	
Pheba fine sandy loam	32,064	11.2	Ochlockonee clay	3,712	1.3
Pheba silt loam	24,768	9.0	Myatt fine sandy loam	3,328	1.2
Imperfectly drained phase	1,152		Chalk (Houston material)	3,328	1.2
Catalpa silty clay loam	23,488	8.2	Cahaba fine sandy loam	3,136	1.1
Trinity silty clay loam	17,664	6.2	Pheba clay loam	1,856	.6
Kalmia fine sandy loam	17,216	6.0	Ochlockonee fine sandy loam	1,792	.6
Ochlockonee silt loam	13,888	4.8	Orangeburg fine sandy loam	1,600	.6
Oktibbeha silt loam	12,288	4.8	Leaf silt loam	1,024	.4
Poorly drained phase	1,600				
Catalpa fine sandy loam	12,160	4.2	Total	286,720	

PHEBA FINE SANDY LOAM.

The Pheba fine sandy loam consists of a grayish fine sandy loam or fine sand, passing at 2 or 3 inches into yellowish fine sandy loam, which is underlain at about 6 to 10 inches by dull-red to yellowish-red or buff, moderately friable silty clay, the yellow color increasing with depth. At about 18 to 20 inches below the surface the subsoil usually is a mottled yellowish and grayish, compact clay, containing enough fine sand to give it a rather friable structure. This stratum usually contains some rusty-brown or dark-colored concretions and is tough and hardpanlike when dry. Often the mottling and the dark ferruginous materials appear in streaks, as seen in exposures of the subsoil. In places the lower subsoil is a mottled red, yellowish, and grayish, plastic clay, somewhat like the subsoil of the Oktibbeha series. The reddish color of the upper subsoil gives way to yellowish on the lower, less oxidized slopes and in the more nearly level areas, and the compact stratum here is nearer the surface.

This type is closely associated with the Pheba silt loam. It occurs on the undulating to gently rolling uplands. Small areas are found on the nearly level tops of the wider divides, but more frequently the type occurs on the slopes and in places where the relief is quite pronounced. In such locations the subsoil is reddish brown and contains more sand than that of the higher and less rolling areas. Throughout the northeastern part of the county the type is

associated with the Ruston fine sandy loam, and the boundaries between the two types are not sharply defined. As a rule the Ruston occupies the rougher and the Pheba the smoother portions of the uplands. On nearly level tops of ridges the Pheba silt loam usually predominates, but its individual areas are small.

Most of the Pheba fine sandy loam is cleared, and much of it in the eastern part of the county is cultivated. The areas near the towns in the central part of the county are largely in pasture, or are tilled in connection with the silt loam. Cotton and corn are the principal crops grown.

The crop adaptations and tillage requirements of the fine sandy loam are generally similar to those of the silt loam type.

PHEBA SILT LOAM.

The typical Pheba silt loam consists of a grayish to light-brownish silt loam, passing quickly into a pale-yellowish silt loam which is underlain at 8 or 10 inches by a reddish-yellow to dull-red or buff, moderately friable silty clay loam to silty clay. With increase of depth the color of the subsoil becomes more yellowish, and grayish mottlings appear, usually at depths of 12 to 18 inches. Ordinarily at 16 to 28 inches a compact layer of clay or sandy clay, mottled yellowish and grayish and frequently reddish, is encountered. The lower subsoil is sometimes drab, with yellowish mottlings, and contains rusty-brown and dark-colored ferruginous concretions and similar segregated material. The red or reddish-brown tints in the subsoil are more pronounced in the higher and better drained areas than in the nearly level areas or on the lower slopes. In the latter situation the subsoil usually is a yellow, moderately friable silty clay, with the grayish mottlings nearer the surface than in the higher lying areas, and there usually is considerable concretionary ferruginous material in the lower subsoil. On the slopes of the higher ridges, particularly in those areas adjoining the Oktibbeha soils, a grayish, plastic clay is encountered within the 3-foot soil section, and the compact layer may be poorly developed or entirely absent.

The Pheba silt loam has a rather extensive distribution throughout the western half of the county and occurs in smaller areas in the eastern part. With the Pheba fine sandy loam, from which it differs only in the more silty texture of the surface soil, it is the dominant soil on the interstream divides, wherever the surface is undulating to gently rolling. On the steeper slopes the silt loam usually grades into the fine sandy loam, or it may pass into a rather heavy variation of the Ruston fine sandy loam.

The surface drainage of the Pheba silt loam is good, but the compact layer forming the lower subsoil interferes more or less with

the internal movement of moisture and air. On the nearly level tops of ridges and on some of the gentle slopes the land becomes miry in protracted periods of wet weather. The soil compacts or crusts on drying, especially where the organic-matter content is abnormally low.

Nearly all this type is cleared, but some of it is used only for pasture. Bermuda grass thrives on this soil, and lespedeza does well, but is shorter than on the alluvial soils.

Yields of cotton are determined in large measure by the methods of tillage and the amount of fertilizer used. The soil is low in organic matter, at least in those fields that have been in cultivation for many years. The type responds well to a complete fertilizer, and this is quite generally used on cotton land. From one-fourth to two-thirds bale of cotton per acre is the ordinary range of yield, the average, at least in recent years, being approximately one-third bale. Without fertilization corn gives low yields. Such minor crops as peanuts, sweet potatoes, cowpeas, and garden truck do well. There are many very old apple trees on this type, and the soil apparently is suited to the production of certain varieties of this fruit for home consumption. Pears and peaches do well.

The present price of land of the Pheba silt loam and of the associated fine sandy loam and clay loam types is determined largely by the distance from towns and the location with respect to improved roads. Each type affords very desirable sites for homesteads, and where fairly well improved the land is valued at $25 to $50 an acre. Some of the land within a mile or two of the larger towns sells for higher prices, while areas remote from the villages and not on surfaced roads can be bought for as low as $15 an acre.

Owing to the length of time most of the Pheba silt loam has been in cultivation its organic-matter content is low, and there has been more or less leaching out or washing off of the finer surface constituents. Some spots are consequently quite sandy, and others, where there has been an accumulation of the wash, consist of clay loam or sandy clay loam, which is inclined to compact badly after rains, breaking up into clods. In the clayey areas the compact subsoil may be encountered within a foot or two of the surface. In all places the surface soil and subsoil are distinctly acid.

This soil can be improved by the application of a ton or more of burnt lime or twice as much ground limestone per acre and by increasing the content of organic matter by crop rotations in which the legumes have a prominent place. The use of the land for pasture improves the soil. The marl from the near-by exposures of the Selma Chalk, scattered on the surface of pastures at the rate of a few

tons per acre, has been found beneficial both to the Bermuda grass and lespedeza and to succeeding cultivated crops.

Pheba silt loam, imperfectly drained phase.—Occasional small areas in the Pheba silt loam, where the surface is nearly level or slightly depressed, are mapped as an imperfectly drained phase. The surface soil is a very light brownish or grayish silt loam, changing at a depth of a few inches to pale yellow. This passes at 6 to 8 inches into yellow silty clay, mottled with gray. At 18 to 28 inches the material may be almost white. In places the subsoil is a compact, light-colored clay or silty clay. In nearly all instances there is considerable rusty-brown and black concretionary material in the subsoil, and frequently small, hard concretions are abundant on the surface.

Most of this phase is uncleared, the forest consisting of post oak, white oak, hickory, and beech. The present agricultural value of this soil is low. Drainage and the application of lime and organic manures are required for its permanent improvement.

The following table shows the results of mechanical analyses of samples of the soil, subsoil, and lower subsoil of the Pheba silt loam:

Mechanical analyses of Pheba silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
423401, 423404.	Soil.....	0.1	1.0	1.8	7.5	10.8	70.3	8.5
423402, 423405.	Subsoil.....	.1	.6	1.0	3.9	6.5	60.5	27.2
423403, 423406.	Lower subsoil...	.3	1.5	1.8	8.1	12.8	56.0	19.3

PHEBA CLAY LOAM.

The Pheba clay loam in one sense is an erosional variation of the silt loam and fine sandy loam types, having been formed through the removal of much of the original surface soil from these types by gentle washing during the long period the land has been in cultivation. The soil consists of a reddish clay loam, underlain at an average depth of about 4 or 5 inches by dull-red or reddish-yellow, moderately friable clay, which passes below into more yellowish material. At about 15 to 20 inches there occurs a mottled yellowish and reddish compact clay, which resembles hardpan and impedes the circulation of moisture and air. It is similar to the layer that occurs in the deep subsoil of the other Pheba types. In places mottled red, yellowish, and drab plastic clay is encountered under the hardpan layer, within the 3-foot section. Included areas have a thin surface covering of a grayish, yellowish, or reddish fine to

very fine sandy loam and silt loam. Such areas plow up a clay loam. Reddish clods are conspicuous in nearly every freshly plowed field, even with the usual shallow plowing.

Areas of this soil too small to map occur in most of the rolling areas of the Pheba silt loam and fine sandy loam. The larger areas in which the clay loam is the predominant soil are indicated on the map. The type occurs mainly west of Saltillo and immediately north of Tupelo, and small areas are encountered near Verona and Shannon. It has been cleared for many years, and cultivation has been continuous. Cotton and corn are the principal crops grown.

Under good tillage this soil is friable, and crop yields are as good as on the Pheba silt loam and fine sandy loam types. The soil hardens on drying and clods when plowed. The soil is generally in need of lime and organic matter.

The following table shows the results of mechanical analyses of samples of the soil, subsoil, and lower subsoil of the Pheba clay loam:

Mechanical analyses of Pheba clay loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
423436	Soil	0.0	1.6	3.0	14.4	7.4	51.9	21.9
423437	Subsoil	.1	1.4	2.8	16.6	6.3	51.8	21.0
423438	Lower subsoil	.2	2.6	4.4	25.6	10.4	37.4	19.2

OKTIBBEHA SILT LOAM.

The surface soil of the Oktibbeha silt loam is a gray to light-brown silt loam 6 or 8 inches deep. The subsoil is a red or reddish-brown moderately compact silty clay loam to 20 or 25 inches, below which it becomes usually a heavy, plastic clay, more or less mottled with gray, light drab, and reddish brown. Where lime rock is within a few feet of the surface the lower subsoil may be a compact, adhesive clay. A tendency to granulate usually is quite pronounced in the subsoil, but is distinctly lacking in the silty surface soil. There is considerable very fine sand in the soil in places.

On the more pronounced slopes the surface soil is thinner and is often a reddish-brown clay loam, while the subsoil is a red or reddish-brown silty clay, changing within the 3-foot section to grayish or drab clay with brownish mottling. The depth to lime rock is less here than on the higher ground.

In all cases the soil and subsoil of the Oktibbeha silt loam are distinctly acid, according to tests with litmus paper.

This type occurs on broad undulating to very gently rolling ridges. Small areas of Pheba silt loam are included with it on the tops of

the wider divides. The surface drainage is good and the underdrainage fair. In wet seasons some of the land dries rather slowly, but serious injury to crops from excess moisture seldom occurs.

Nearly all the type is cultivated. Some of it in the northern part of the county was cleared before the Civil War, and for many years it produced good crops. The type is highly esteemed for general farming, although many fields have been impoverished through careless farming and the soil has become light colored and packs badly after rains. On the lower slopes and in depressions, where the surface soil is generally deeper and more sandy, it is easier to keep the soil in good tilth. The areas northwest of Tupelo are all more or less influenced by limestone, which underlies them at comparatively shallow depths, and are highly desirable for general farming.

The usual yield of cotton ranges between one-third and one-half bale per acre, if no fertilizer is used. With light applications of a complete fertilizer these yields are about doubled in favorable seasons. The yields of corn are light in most instances, but an increase in the organic-matter content invariably gives increased yields. In 1915 a small field of wheat on this type yielded 15 bushels per acre.

The value of land of this type situated on a good road is about $40 to $50 an acre.

The location, topography, and ease of cultivation of this soil make it desirable for diversified farming. Most of it, however, is deficient in organic matter. This should be supplied by adding barnyard manure where available or by growing and occasionally plowing under green-manure crops. Rotations, including leguminous crops, would aid in building up the worn fields. The soil is deficient in lime, particularly in the very light gray, silty areas on the tops of broad divides. In general, tile drainage would be beneficial.

Oktibbeha silt loam, poorly drained phase.—The surface soil of the poorly drained phase of the Oktibbeha silt loam consists of a grayish silt loam to very fine sandy loam, passing just below the surface into a pale-yellow silt loam. At about 6 or 8 inches from the surface this grades into a yellowish or reddish-brown, plastic silty clay, which becomes heavier with depth, passing below 15 inches into a sticky, tenacious clay, nearly impervious to air and water. This stratum is gray or very light drab, more or less mottled with various shades of brown, and often with some bright-red spots. As a rule the lower subsoil and substratum are very light colored and consist of material difficult to penetrate with the soil auger.

The underlying material is the Selma Chalk, which is exposed in gullies on the slopes at a depth of a few feet. In such locations the type passes into the typical Oktibbeha clay. In the gently undulating to level areas where this phase is best developed the depth to rock usually is several yards.

This phase forms the so-called flatwoods or post-oak land of the southwestern corner of the county. The forest here consists chiefly of white, post, and red oak, with considerable blackjack oak in places. The small areas south of Tubbalubba Creek are local flats covered with white and post oak. The larger areas generally are rolling, and the surface drainage is good. In winter or during protracted rains the ground is soft and miry.

The land in cultivation is owned chiefly by negroes. The usual yields of cotton are low, notwithstanding the crop is grown largely in the most favorable spots.

Land values range from about $10 to $12 an acre.

OKTIBBEHA CLAY.

The Oktibbeha clay consists of a reddish-brown to chocolate-brown clay, passing at 1 inch to 5 inches into reddish-brown or brownish-red heavy, plastic clay a few inches to 8 or 10 inches thick. The lower subsoil usually is a mottled reddish, drab, and yellowish, sticky clay, becoming lighter with depth. The limestone, which underlies the soil, is seldom found at depths of less than 3 or 4 feet, except near the contact with the Oktibbeha clay, shallow phase.

The Oktibbeha clay occurs chiefly in the vicinity of Tupelo and in the eastern and southeastern parts of the county. Many small patches are included with the shallow phase, occurring as a rule, in the higher areas.

The Oktibbeha clay in places resembles the heavier variations of the Susquehanna fine sandy loam, but seems to be a more productive soil than the Susquehanna, although not so easily cultivated. Its tillage requirements are similar to those of the shallow phase, and it does not differ greatly from the phase in crop adaptation.

Practically all this type has been in cultivation many years. Under good management cotton, oats, cowpeas, and sorghum for forage do well. The effects of careless tillage usually are very apparent, for this heavy, granular clay can not be cultivated without impairment under so wide a range of moisture conditions as the lighter soils.

Oktibbeha clay, shallow phase.—The surface soil of the shallow phase of the Oktibbeha clay is a dark reddish brown to brownish-red, granular clay, grading at a depth of a few inches into heavy red clay in which various shades of reddish brown and yellowish brown are mixed with grayish or drab. In places, with increase of depth, the color becomes lighter, usually changing to light drab with little mottling. At variable depths, but usually within 30 inches of the surface, whitish, yellowish, or greenish-yellow chalky material

is encountered. This is highly calcareous and quickly grades into the partially decayed limestone.

As mapped this soil includes many exposures of the soft limestone, Houston Chalk, varying in extent from mere hillside "galls" to eroded areas of several acres from which nearly all the clay has been removed. The eroded areas are most numerous in the more rolling sections, particularly on the blufflike slopes near the larger streams. On many of the slopes, particularly those along streams, there are strips and patches of this phase—that is, a brownish, calcareous clay with a yellowish, sticky clay subsoil, usually containing whitish soft limy material.

In the smoother areas there are many patches where the light color of the soil indicates its shallow depth. On the tops of broad ridges the surface soil usually is lighter colored than on the hillsides. In local depressions the soil is dark colored and often very loamy, as a result of accumulated wash from the surrounding higher land. There are occasional small areas in the southern part of the county where, on comparatively high land, the soil is an ashy-brown to black clay. These areas represent included patches of the Houston clay and Houston black clay.

With the possible exception of these ashy-brown to black areas, the surface soil usually is acid according to the litmus-paper test. This is also true of the subsoil to such depths as the red or brown color predominates. An exceptionally high content of lime does not seem to extend much above the sticky, light-colored clay overlying the soft limerock.

The largest areas of this shallow, Oktibbeha clay lie to the west and southwest of Tupelo. There are also a number of areas in the southeastern part of the county and in the northern part, near Guntown.

The topography is generally rolling, with steep slopes in the immediate vicinity of the larger streams. The surface drainage of practically all areas is good. The unaltered limerock occurs at a depth of several feet, but even if it lies at less depth it is so fissured and broken that it seldom impedes the underdrainage. The soil is very retentive of moisture and is slow to dry out after heavy rains.

Most of this land was cleared of its post oak and other trees many years ago, and it is said to have been very productive for a period of 10 or 15 years after clearing. It has declined in productiveness, probably as the result mainly of erosion and to some extent the depletion of the organic matter through clean cultivation. The soil would be made more mellow by the addition of organic matter. The granular structure of this clay, however, is favorable to tillage, provided it is done at the proper moisture stage. Where properly managed, this soil is now very satisfactorily cultivated.

Cotton is the principal crop grown. The yields range from almost nothing in poorly cultivated hillside fields to upward of 1 bale per acre on the darker colored soils of the depressions. In the areas of dark soil corn also does well, but elsewhere the lack of organic matter renders the type poorly adapted to this crop. Oats are grown to some extent. On the darker included areas alfalfa thrives, and many small patches have successfully been established.

Much of the eroded area has been thrown out of cultivation, but the land is generally used for pasture. Bermuda grass and lespedeza are the most abundant pasturage plants on such lands, with usually considerable white clover and some bur clover. Melilotus is abundant in nearly all roadside gullies and where the chalky substratum is exposed. The scrubby timber on uncleared hillsides consists chiefly of wild crabapple, locust, and redbud.

The price of this land is determined largely by location with respect to improved roads, distance from towns, and topography. It ranges from about $25 to $50 an acre.

The soil is deficient in organic matter. Winter cover crops such as oats, bur clover, and crimson clover should be more generally grown. On lands that are so badly washed as to be untillable melilotus thrives and its more extensive use offers the most practicable means of rendering such lands more valuable for pasture and eventually reclaiming some areas for tilled crops. With but few exceptions the farm equipment, particularly of the tenants, is too light to handle properly such a heavy soil.

RUSTON FINE SANDY LOAM.

The Ruston fine sandy loam consists of grayish fine sand or loamy fine sand, passing at a depth of a few inches into pale-yellow loamy fine sand, and this at about 6 to 10 inches into dull-red or brownish-red, friable sandy clay. With increase in depth the subsoil in many places becomes more sandy, and frequently at 30 or 40 inches it passes into yellow or more or less mottled yellowish, brownish, and grayish loamy fine sand. Some areas have a fine sandy loam surface soil. In places the upper subsoil is rather silty and is compact, resembling the upper subsoil of the Pheba series.

There is considerable textural variation in both soil and subsoil with difference in topographic position. The sandier soil occurs where the surface is rough, and the heavier soil on the broader divides. There are included patches of Pheba fine sandy loam, washed areas of Ruston clay or clay loam, and some Orangeburg fine sandy loam.

The substratum in many places is a gray or mottled gray, yellow, and brown silty fine sand, containing considerable mica. This

friable basal material occurs principally in the more hilly areas. On the broader ridges the substratum to a depth of several yards is generally a compact sandy clay, not differing essentially from the substratum of the Pheba soils.

The material throughout the 3-foot section is acid, according to the litmus-paper test. On the lower hillsides there are frequent exposures of calcareous material, and this sometimes influences the soil in such locations and in the adjoining branch bottoms. Wells on the ridges show lime-bearing material at depths of 10 to 40 feet.

The Ruston fine sandy loam is confined to the east-central and northeastern parts of the county. The topography of the areas adapted to tillage ranges from rolling to hilly, with included small areas that are too rugged for cultivation. The average elevation is greater than that of the adjoining types, but the local range in elevation is usually less than 50 feet.

Most of the smoother areas of the type are in cultivation. Cotton is, and has been for many years, the chief crop. Prior to the appearance of the boll weevil the average yield was about one-half bale per acre. Little of this type is planted to corn; most of this grain grown within the region of the Ruston soils is produced on the alluvial or semialluvial soils along the small drainage ways. Sorghum, cowpeas, sweet potatoes, and nearly all garden crops do well on practically all parts of the type, but are not important except for use on the farm. Some peaches are grown for home use. The type seems well suited to pears, but apple trees are said to be short-lived.

The selling price of smooth land of this type is quite variable. Some uncleared land on which there is considerable small timber has been offered recently for as little as $5 an acre, but most of such land is held at about $10 to $15. Cleared lands, on which the improvements usually are rather meager, rarely sell for more than $25 an acre. In all instances the acreage of included bottom land or of steep hillside land affects the selling price.

In this type the loss of organic matter is comparatively rapid, owing to the rather open nature of the soil and to erosion. Winter cover crops should be more generally grown, and the addition of organic matter by the more frequent growing of crops such as cowpeas and soy beans is very beneficial. Commercial fertilizers and barnyard manure, where available, have generally increased yields on this soil throughout its wide extent in the Southern States. Terraces should be maintained on practically all the cultivated land to check erosion. Much of the type could be profitably utilized for pasture, as Bermuda grass and lespedeza supply good grazing. The type is well adapted to early truck and peaches.

Ruston fine sandy loam, hilly phase.—The hilly phase of the Ruston fine sandy loam represents areas so hilly that they are of rela-

tively little value for cultivation. The soil for the most part is quite variable, but a light-colored fine sandy loam surface soil with a red, friable sandy clay subsoil predominates. The occasional outcrops of the Selma Chalk usually are confined to lower hillsides, so that the soil generally is not influenced by the addition of material derived from this formation. A few tillable areas are included, but these can not be satisfactorily shown on the map. They consist of the tops of ridges and the bottom lands and adjoining lower slopes of small streams, mainly between Mooreville and Plantersville.

On the southern sides of Mantachie, Patch, and Puncheon Creeks the phase includes more or less continuous belts of broken land, unsuitable for tillage. The dominant soil is Ruston, but there are many included small areas of Susquehanna fine sandy loam and Orangeburg fine sandy loam, and less numerous areas of Oktibbeha soil. Practically all this land is forested.

The area bordering Twentymile Creek on the south, from Chapelville eastward, consists chiefly of short, narrow ridges, separated by deep ravines. The soil ranges from loose sand several feet deep to stiff, red clay. This area is forested and has little agricultural value.

ORANGEBURG FINE SANDY LOAM.

The surface soil of the Orangeburg fine sandy loam is a gray fine sand, changing at a depth of a few inches to a yellowish or light brownish gray fine sandy loam. This passes at about 6 to 12 inches into a brick-red, friable fine sandy clay, which is rather compact in places. The lower subsoil usually is sandier and somewhat brighter red than the upper subsoil, but otherwise there is usually little change in the material below the surface soil to a depth of several yards.

Small areas of this type are mapped northeast of Plantersville, east of City Point, and northeast of Nettleton. There are many small areas included with the Ruston fine sandy loam. As a rule, the small Orangeburg areas occur on the higher ridges and are seldom found on the lower slopes or on gentle declines.

The areas of Orangeburg fine sandy loam large enough to map are mainly cleared, but a large part of the land is used only for pasture. Blackjack oak and hickory are common trees in the virgin forest growth. The type produces good crops of cotton, where properly handled. It responds well to good tillage and to the application of fertilizers or manure and is improved by the growing of legumes. The structure of the subsoil and substratum is favorable to the retention of moisture. In general, the crop adaptations and cultural requirements of this type are identical with those of the smoother areas of the Ruston fine sandy loam.

SUSQUEHANNA FINE SANDY LOAM.

The surface soil of the Susquehanna fine sandy loam is a grayish fine sand to fine sandy loam which changes with depth to a pale-yellow fine sandy loam. This is underlain at 6 to 10 inches by a red, plastic clay which changes in the lower subsoil to a mottled red, brown, and gray plastic clay, containing more fine sand than the upper subsoil. With increase in depth the proportion of fine sand usually increases, so that the lower subsoil is a fine sandy clay. The substratum is frequently a rather loose, silty fine sand, with an abundance of mica flakes. Mica also occurs in the surface soil and subsoil, giving the latter a smooth feel. When wet, the subsoil clay is very sticky.

Both the soil and subsoil are distinctly acid. A determination of the total lime content of a composite sample taken about one-half mile south of Eggville gave the following results:

Total lime content in Susquehanna fine sandy loam.

Depth of sample:	Per cent CaO.
0–6 inches	0.16
6–20 inches	.46
20–36 inches	.18

The topography of this soil ranges from strongly rolling to hilly, but nearly all the land is tillable. The surface drainage is good, but owing to the heavy nature of the subsoil the internal movement of moisture is retarded and the fields remain wet for long periods after heavy rains. This is most apparent on hillsides, where the red clay is nearer the surface. This type is found chiefly in the east-central part of the county.

Most of this type is in cultivation. On land not seriously eroded, and where the friable surface soil either contains some organic matter or is supplied with 100 to 200 pounds per acre of commercial fertilizer, the average yield of cotton is about one-half bale per acre. Corn does poorly and is seldom planted except on recently cleared land. The type seems well adapted to sweet potatoes, particularly where the surface soil is a foot or so deep, and yields of 200 bushels per acre are reported. Peanuts do well and are very easily grown. Peach trees do not grow so well on the heavy areas of this type as on those having a deep sandy surface soil. Apples and pears do not seem to thrive so well as on the types having a more silty or sandy subsoil. Bermuda grass spreads rather rapidly and forms a good sod, but very little of the type is used for pasture. Lespedeza succeeds on this soil.

The price of this land ranges from about $15 to $25 an acre.

Care should be exercised in cultivating the steeper slopes, in order to prevent erosion. Terracing and contour plowing should be practiced. The legumes should be grown in rotation with other crops.

In the following table are given the results of mechanical analyses of samples of the soil, subsoil, and lower subsoil of this type taken three-fourths mile southwest of Eggville:

Mechanical analyses of Susquehanna fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
423410.....	Soil, 0–6 inches..	0.1	0.4	0.6	45.0	28.4	14.4	11.0
423411.....	Subsoil, 6–20 inches.....	.0	.1	.2	25.2	20.0	11.5	43.0
423412.....	Lower subsoil 20–36 inches...	.0	.0	.2	35.2	22.6	9.4	32.5

KALMIA FINE SANDY LOAM.

The surface soil of the Kalmia fine sandy loam is a gray to light brownish gray fine sand to fine sandy loam, passing at a few inches into pale-yellow, friable fine sandy loam. The subsoil, beginning at about 8 to 15 inches, is a yellow sandy clay mottled below with gray or drab. Frequently the lower subsoil is compact. This rather compact stratum usually extends to a depth of several feet, and in places it rests upon light-colored sand.

As mapped, the type includes small patches of the Myatt fine sandy loam, occurring as local flats and slight depressions having poor drainage. There are also small areas of Cahaba fine sandy loam, which occupy slight elevations and in many instances form a narrow border along the outer margin of the terraces. There are likewise included a few small moundlike elevations of the first bottoms, where the soil is a brownish fine sandy loam to a depth of 10 to 20 inches.

This type occurs in second bottoms lying from 10 to 25 feet above the present flood plains with occasional higher areas. The surface is nearly level to very slightly undulating. The Kalmia fine sandy loam is widely distributed. It is developed on the northern terraces of all the large valleys in the western and southern parts of the county. It occurs also along the larger streams in other parts of the county, but the areas, excepting those along Twentymile Creek, are generally narrow.

The drainage of this land is fairly thorough. In most instances tile drainage would be beneficial, not only on the level areas, where the yellowish subsoil with grayish mottlings at a depth of 12 or 18 inches indicates sluggish-water movement, but also on the higher

terraces, where a compact subsoil prevents the free downward movement of excess rainfall.

Nearly all this type was cleared early in the settlement of the county. Much of it is now used only for pasture on account of the decreased yields resulting from long-continued use without improvement. The surface soil of these old fields usually is very friable and the average moisture conditions good. The areas having a brownish and somewhat coarser textured soil still produce good crops of cotton, sorghum, and sweet potatoes after almost continuous cultivation for many years. Oats give fairly good returns, but corn produces light yields and is seldom planted on this type.

The price of this land ranges from about $25 to $50 an acre, depending chiefly on the location.

This soil responds well to good tillage and fertilization. Applications of phosphatic fertilizers are reported especially effective with cotton and cowpeas. The acidity of both soil and subsoil is pronounced, and applications of lime unquestionably would give good results. The growth of lespedeza, white clover, hop clover, and Bermuda grass in all uncultivated fields indicates that the soil may readily be improved by a change to permanent pasture or by practicing a rotation in which cowpeas, soy beans, or legumes have a prominent place. Growing winter cover crops would greatly benefit all of this type and the included areas of other types.

CAHABA FINE SANDY LOAM.

The surface soil of the Cahaba fine sandy loam is a light-brown fine sandy loam of variable depth, but usually not exceeding 8 to 12 inches. This grades into dull-red or reddish-brown material ranging in texture from a friable fine sandy clay to a somewhat compact silty clay loam. Below 20 to 30 inches the subsoil is more sandy, but rather compact in places. The structure throughout the entire 3-foot section is favorable to underdrainage and aeration. Drainage is also facilitated by the presence of a sandy substratum and by the billowy surface which characterizes all the type.

This soil occurs on low swells and hummocks along the outer margins of the higher terraces, and where the terraces are crossed by shallow, ravinelike drainage ways.

Practically all the Cahaba fine sandy loam is in cultivation. Cotton and corn are the principal crops. The yields obtained under the methods ordinarily employed are rather low. With proper deep plowing, the maintenance of a good supply of organic matter, and moderate additions of manure or commercial fertilizer this soil has given good yields of cotton, corn, oats, sorghum, cowpeas, peanuts, and a number of other forage crops in other parts of the South.

MYATT FINE SANDY LOAM.

The soil of the Myatt fine sandy loam, to a depth of 5 or 6 inches, is a fine sandy loam, moderately dark gray when moist, but ashy gray when dry. The upper subsoil usually is a light-gray fine sandy loam, faintly mottled with pale yellow. At a depth of 18 to 24 inches a compact silty clay or fine sandy clay, marked by more or less rusty-brown mottling and containing some dark-colored concretionary material, is encountered. The lower subsoil and the substratum are so impervious that underdrainage is slow. The soil becomes compact on drying. Both the soil and subsoil are invariably acid.

In some localities the greater part of the 3-foot section is a fine sandy loam, and the compact layer occurs in the extreme lower subsoil. This is true of much of the type on the east side of Old Town Creek near Tupelo.

The Myatt fine sandy loam occurs on the terraces of several of the larger streams in the southern and southwestern parts of the county. The areas seldom contain more than a few hundred acres. In the larger are included low ridges or swells and hummocks on which the soil is a brown fine sandy loam and the subsoil a yellowish sandy clay. This soil is the Kalmia fine sandy loam, occurring in areas too small to be separated satisfactorily on the soil map. Elsewhere the surface is flat or has a very slight slope toward the streams. The average elevation is sufficient to prevent overflow, except along the outer margin of the areas and where small tributaries cross the type. The soil of the flooded areas frequently is heavier and darker colored than typical.

Most of this type is cultivated. Crop yields vary from year to year with the precipitation. Where the amount and distribution of the rainfall are favorable the yields of cotton and corn are generally fairly satisfactory. Small areas have been tile drained and the yields of cotton increased from one-third to one-half bale or more per acre. Yields of about 40 bushels of corn are reported, but this is much above the average. Lespedeza does well on this type.

For its improvement this soil is in need of better drainage, deep plowing, and the growing of legumes.

MYATT SILT LOAM.

The typical Myatt silt loam consists of a light-gray silt loam, which is rather compact when dry, underlain at about 6 to 8 inches by mottled yellow and gray or drab clay, which passes below into drab, plastic, compact clay. This lower subsoil usually has considerable brownish and yellowish mottling and contains some soft ferruginous

concretions, but in some of the more poorly drained places it is a rather dense silty clay, steel gray to light drab in color, with little mottling, and containing very little concretionary material. The soil and subsoil are distinctly acid. There is generally little indication of organic matter in the soil.

The largest area of this type occurs on the east side of the valley of Old Town Creek, near Nettleton. It occupies a low, gently sloping second bottom, the lower or outer part of which is subject to occasional overflows. Smaller areas occur along Coonewar Creek, north of Shannon, and in a few other places in that valley. The type also occurs on the higher second bottoms, usually as flat areas in the Kalmia fine sandy loam. Many of these areas are only a few acres in extent or are of such irregular outline as to render their separate mapping impracticable.

The natural drainage of all the type is poor. This condition is due chiefly to topographic position, but in part to the rather impervious nature of the lower subsoil. There is much local variation in thoroughness of drainage. As a rule, the drainage conditions are indicated by the color of the soil material. An ashy-gray color of the surface and a very light gray or drab color of the subsoil characterize the areas of poorer drainage, and brownish soils with considerable mottling in the subsoil mark the areas where the average moisture conditions are more favorable to cultivated crops. An abundance of concretionary material usually indicates frequent saturation of the subsoil.

Most of the type on the low second bottoms or terraces is cultivated, while nearly all that on the high terraces is uncleared. The areas on the higher terraces are the more difficult to drain, since an adequate outlet can be obtained only by ditching through the higher lying areas of Kalmia soil. The lower areas usually have a slight slope toward the nearest stream. Their agricultural value is higher in many places as a result of the wash of fresh material from the adjoining higher land, and by the occasional addition of materials from the flood waters on the lower areas.

Near Nettleton some of the heavier areas of the type have been tiled, and good yields of cotton are now obtained where formerly crop returns were greatly dependent upon seasonal conditions. Corn is practically confined to the darker-colored areas, which are fairly well adapted to the crop. Oats do not do well in seasons of heavy rainfall. The type is adapted to sorghum, lespedeza, and white clover, but is not suited to the other clovers or to alfalfa.

For the improvement of this type, tile drainage or ditching and the use of lime are needed.

Myatt silt loam, heavy phase.—The Myatt silt loam, heavy phase, consists of a grayish silt loam to very fine sandy loam, underlain at

about 3 to 5 inches by pale-yellow or mottled yellowish and grayish silty clay loam to clay, which passes quickly into stiff clay mottled with grayish and pale yellow. The lower subsoil is characteristically a plastic, dense, impervious clay of drab or gray color, with some yellowish or brownish mottling. In nearly all instances the subsoil and substratum are too compact to permit good underdrainage and aeration. Black and brownish concretions, apparently of a ferruginous nature, and similar material not in the form of concretions are present. If this phase were of greater extent, it would be mapped as the Myatt silty clay.

This phase is developed on second bottoms. The largest area occurs on the north side of Tubbalubba Creek in association with the Leaf silt loam. Very little of this flat, poorly drained land is cultivated. It is locally called "post-oak flats" and "flatwoods." The land is mainly forested, the principal trees being post oak, white oak, and hickory.

With ditching or tiling, cotton, sorghum, oats, and forage crops would probably succeed on this soil. In its present condition lespedeza is one of the most promising crops. Rice is successfully grown, with irrigation, on land of this kind in Arkansas.

LEAF SILT LOAM.

The surface soil of the Leaf silt loam is a light-brown to grayish-brown, friable, fine silty loam. In places the texture varies to a light fine sandy loam. At a depth of 5 to 6 inches there is encountered a pale-yellowish silty clay or clay, which usually is very plastic when moist, and which grades at about 12 to 15 inches into a gray, stiff, compact clay, marked with streaks of reddish brown and yellow or yellowish brown. As a rule, the lower subsoil is lighter colored, more adhesive, and less conspicuously mottled than the overlying material. It evidently continues uniform to a depth of several feet, or to the lime rock, which usually is encountered at depths of 8 to 12 feet. In places a layer of sand occurs between the limestone and the clay, but this does not appreciably affect the underdrainage.

This type occurs on terraces or second bottoms bordering the Tubbalubba Creek flood plains on the north. The surface in places slopes gradually from the base of the low hills on the north to the ill-defined outer margin of the second bottom. In other places the outer boundary is marked by a sharp slope of a few feet, and the surface of the terrace is very slightly undulating. In all instances the drainage is rather poor, owing to the dense, impervious subsoil, as well as to the lack of surface relief. Where the drainage is poorest the surface soil is lightest in color, and small concretions about the size of buckshot usually are abundant. In such places, especially

in the wider level areas, the type grades into the Myatt silty clay loam.

The greater part of this type is cleared, but some of the cleared land is used chiefly for pasture. Cotton does well, provided the rainfall in the growing season is light and well distributed. In wet seasons, particularly in the level areas, the crop is uncertain, and rust is often troublesome. Yields are higher in dry years, especially if frequent tillage is given. Oats and other crops have not been grown to any important extent. Corn does not do very well. Lespedeza thrives, and some fields thrown out of cultivation afford good pasturage. The type is highly acid and is deficient in organic matter. Tile drainage or ditching would benefit this type.

TRINITY SILTY CLAY LOAM.

In its typical development the Trinity silty clay loam consists of a black, crumbly silty clay loam grading at a depth of 8 or 10 inches into a black silty clay, which in the lower part of the 3-foot section may be slightly lighter colored and obscurely mottled with dull rusty brown. The soil has a distinctly granular structure when dry, and the surface of cultivated fields under usual moisture conditions is very mellow, forming a good seed bed. When wet, the soil is very sticky, and tillage is impracticable. In most places the surface soil is decidedly calcareous. The subsoil usually is less calcareous, but it seldom shows traces of acidity, except near the contact with areas of the Ochlockonee or Catalpa soils.

The Trinity silty clay loam occurs in the west bottom-land areas in the larger valleys of the western and southern parts of the county. The areas lie for the most part above high-water mark of the main streams, but are subject to brief overflows by their tributaries. In many instances the type consists of alluvial fans at the mouths of short drainage lines issuing from adjoining areas of Oktibbeha clay. The bottom-land areas along branch streams within the latter type usually have the black, granular surface soil typical of the Trinity series, but the subsoil may be more or less mottled and of variable texture. At the foot of some of the blufflike slopes, where there are conspicuous outcrops of the Selma Chalk, the alluvium contains in places considerable recently deposited material from this source.

The natural drainage of part of this type is sufficient for satisfactory tillage. Owing to its high agricultural value, much of the type has been tile drained, and such improvement is being generally extended.

All the Trinity silty clay loam is cultivated. A large part of it during the last few years has been devoted to corn, and yields of 70 to 80 bushels per acre have been obtained. Cotton does well, and before the advent of the boll weevil a yield of 1 bale per acre com-

monly was obtained. This is the best alfalfa soil of the county, its high content of lime and its granular structure being favorable to this crop, and a considerable acreage is now devoted to alfalfa, chiefly in the vicinity of Tupelo.

The present selling price of this land in the immediate vicinity of the towns ranges from $75 to $100 an acre. In smaller areas and in areas more remote from the towns the land is held at about $50 to $75 an acre.

In the following table are shown the results of mechanical analyses of samples of the soil and subsoil of the Trinity silty clay loam:

Mechanical analyses of Trinity silty clay loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
423431	Soil	0.0	1.2	1.9	14.4	7.4	55.8	18.8
423432	Subsoil	.0	1.8	2.9	18.0	6.9	49.1	21.3

OCHLOCKONEE FINE SANDY LOAM.

The Ochlockonee fine sandy loam consists of a mellow, light-brown loamy fine sand to fine sandy loam underlain at about 10 to 15 inches by heavier, lighter colored subsoil material. This usually is a silt loam or silty clay containing little sand, but in some instances it consists of a fine sandy loam extending to a considerable depth. In the bottom lands of the small branch streams the type usually consists of a brown sandy loam, containing quite variable proportions of silt and clay, underlain by a subsoil which ranges in texture from a fine sandy loam to a sandy clay. Gray, drab, and yellowish mottlings are common in the lower subsoil.

The typical Ochlockonee fine sandy loam is well drained between the occasional overflows. As a rule the underdrainage and aeration are good to a depth of 2 or 3 feet, or to such a depth as the brown coloration prevails. There is much variation in this respect, and in many places the occurrence of light-colored, mottled subsoil material at about 1 foot below the surface indicates frequent saturation in the lower subsoil. In some instances this is due to seepage from higher land, but more frequently to the low position of the type. Nearly all the wider bottoms have many open ditches. Only a few small areas of this type occur in Lee County.

Nearly all this type is in cultivation. It is probably not so productive as the heavier types of the series, but good yields of corn and cotton are generally obtained. Lespedeza, sorghum, and Bermuda grass do well.

OCHLOCKONEE SILT LOAM.

In its typical development the Ochlockonee silt loam consists of a brown, mellow silt loam, underlain by a brown, more compact silt loam or silty clay loam, mottled with gray in the lower part. As mapped, the type includes some Ochlockonee silty clay loam and fine sandy loam. The sandy areas generally occur near the channels of the creeks.

Areas of this soil occur chiefly in the western and northern parts of the county. The areas along Old Town Creek are largely uncleared. The type is not very extensive, but is locally important, owing to its high productiveness. It is more easily cultivated than the Ochlockonee clay and produces better yields than the fine sandy loam. While not noticeably calcareous, it evidently contains sufficient lime for most crops. A few of the small areas near the Oktibbeha soils have been influenced by wash from lime outcrops.

Cotton and corn are the principal crops. Heavy yields of corn are obtained. The boll weevil has somewhat reduced the yield of cotton; otherwise good crops could be counted upon in normal seasons. Lespedeza, sorghum, white clover, Bermuda grass, and Johnson grass do well.

OCHLOCKONEE CLAY.

The surface soil of the Ochlockonee clay is a brown to dark-brown silty clay, underlain at variable depths, but usually at 8 or 10 inches, by a somewhat lighter brown clay or silty clay, mottled with rusty brown. The mottling usually becomes more noticeable with depth, and drab or gray mottlings occur in the lower subsoil. The subsoil is rather dense, but it is not impervious to water, and the aeration apparently is good to a depth of 2 or 3 feet. The surface soil is granular when dry. In most places the water table during the summer is several yards below the surface. On slight elevations in the valley of Chowappa Creek the surface soil is more silty, with a light-brown to yellowish-brown, rather compact subsoil. The soil is sticky when wet, but crumbles on drying.

The chief development of this type is in the valley of Chowappa Creek. Small areas of the type occur in the valleys of Old Town Creek and other streams. Some patches too small to be shown on the soil map are included with other types. The Ochlockonee clay is not very extensive, but is important owing to its productiveness.

The soil usually is acid, according to litmus-paper tests except where the type adjoins the Trinity silty clay loam, in which case it is more or less calcareous. The subsoil almost invariably gives an acid reaction.

All the type is cultivated. The yields of corn range up to 50 or 60 bushels per acre. Cotton produces fair to good yields. Alfalfa has been grown in a few places. Areas of dark-colored, granular soil, not subject to prolonged overflow, have proved well adapted to this crop. This type is somewhat more difficult to keep in a pulverulent condition than the mellower silt loam type.

The price of land of this type is $40 to $50 an acre.

This soil is generally handled in an efficient manner. Two-horse plows are the lightest that should be employed in breaking the land. Lespedeza, sorghum, white clover, Bermuda grass, and Johnson grass afford good grazing and produce good yields of hay on this soil in various parts of the South.

CATALPA FINE SANDY LOAM.

The surface soil of the Catalpa fine sandy loam usually is a light-brown fine sandy loam, grading at a depth of a few inches into a somewhat heavier and more coherent fine sandy loam, which may be pale yellow or yellowish brown in color. With increase in depth the proportion of silt and clay generally increases, the material in the lower subsoil becoming a sticky sandy clay or silty clay. Gray or drab, with yellowish-brown and rusty-brown mottlings, is the characteristic color of the lower subsoil. Imperfect drainage existing in many places at the foot of hillsides and in depressed spots at some distance from the creek channels is responsible for this mottled condition. The typical Catalpa should contain considerable lime. As mapped in this county it includes areas of Ochlockonee fine sandy loam.

This is the predominating type along the small streams draining the Ruston fine sandy loam. The soil in the narrow bottom lands of many of the branch streams lying entirely within areas of Ruston soil is rather coarse textured, but the drainage frequently is very poor. Along the larger streams, where the bottoms are from one-eighth to one-fourth mile wide, the soil usually is darker colored. Along the lower courses of Mantachie, Puncheon, and Tulip Creeks the type as mapped includes considerable silt and fine sandy loam, corresponding to the better drained Ochlockonee soils. In all instances the soil and subsoil are decidedly acid.

Nearly all this type is in cultivation. There is so much local variation in texture, drainage, and the extent of recent washings from the adjoining hills that it is difficult to estimate the average yields of crops. On the darker colored and better drained land heavy yields of cotton are obtained. Some areas consisting of a coarse, whitish, sandy surface soil overlying a drab subsoil, as in many of the very

narrow bottoms, give much smaller yields. In the light-gray silty areas rust is often troublesome, and corn gives poor yields, except in the most favorable seasons. Where the type resembles the Ochlockonee sandy loam and includes areas of silty or clayey soils, good crops of cotton and corn are grown.

With proper drainage by ditching or tiling the greater part of the type may be expected to give good yields of corn and cotton in favorable seasons. Among other crops that succeed are cowpeas, sorghum, and oats. Sorghum, lespedeza, Bermuda grass, Johnson grass, and white clover have generally done well on this type in other parts of the South.

The following table shows the results of mechanical analyses of samples of the soil, subsoil, and lower subsoil of the Catalpa fine sandy loam:

Mechanical analyses of Catalpa fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
423439	Soil	0.0	0.1	0.2	33.2	34.6	23.8	7.8
423440	Subsoil	.0	.4	.5	26.4	26.4	30.0	16.2
423441	Lower subsoil	.0	.2	.5	26.8	25.8	28.6	17.8

CATALPA SILT LOAM.

The Catalpa silt loam consists of a brown, mellow silt loam, underlain at about 8 to 12 inches by mottled yellowish and grayish, rather stiff silty clay loam to silty clay, of a somewhat plastic nature. Rusty-brown mottling is common in the subsoil. In a few places wash from the limestone soils of the upland has given rise to soil of darker color and heavier texture. The type as mapped includes some Ochlockonee silt loam.

This type occurs along many of the smaller streams of the eastern and southeastern parts of the county. It also is developed to some extent in the larger valleys. Some small areas have been included with the Catalpa silty clay loam.

The Catalpa silt loam is not extensive, but most of it is cultivated, and with the exception of occasional light-grayish spots, caused by poor underdrainage, good yields of cotton and corn are obtained. White clover, lespedeza, sorghum, and Johnson grass do well. In some parts of the South this type is successfully used for Bermuda-grass hay and pasture land.

The following table shows the results of mechanical analyses of samples of the soil and subsoil of the Catalpa silt loam:

Mechanical analyses of Catalpa silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
423447	Soil	0.2	0.6	0.9	4.2	18.0	63.5	12.5
23448	Subsoil	.0	.8	1.4	8.4	18.6	43.1	27.5

CATALPA SILTY CLAY LOAM.

The surface soil of the Catalpa silty clay loam is a brown to dark-brown silty clay loam, with some rusty-brown mottlings below the immediate surface layer. It is underlain at about 8 to 10 inches by light-gray or nearly white, somewhat plastic silty clay, mottled with yellow and brown. In nearly all instances the subsoil becomes stiffer and more compact with depth. In places the lower subsoil is a light-drab, tenacious clay with little mottling. Sand or sandy material rarely is found in the 3-foot section or in the substratum to a depth of several yards. As mapped the type includes some Ochlockonee silty clay loam.

In many places the soil effervesces vigorously with hydrochloric acid, indicating a high lime content, but elsewhere it is neutral or even acid according to litmus-paper tests. The presence of lime is due to wash from the calcareous soils of the upland. The litmus-paper test usually indicates acidity in the subsoil. An analysis to determine the total content of lime in a composite sample collected in Mud Creek Valley, about 7 miles east of Belden, gave the following results:

Total lime content in Catalpa silty clay loam.

Depth of sample:	Per cent CaO.
0–8 inches	2.12
8–24 inches	.72
24–36 inches	.78

The Catalpa silty clay loam occurs in all the larger creek bottoms. As mapped in the valleys of Old Town and Mud Creeks this type includes small areas of the Bibb silt loam, which is distinguished by the light color and compact structure of the soil. There are also variations resembling the Ochlockonee soils, but these are of small extent.

The Catalpa silty clay loam, which was of little agricultural value until drainage canals were dug, is now one of the most important and productive soils in the county. Most of it has been brought under cultivation, and the remainder, with the exception of an area of several hundred acres between City Point and the southern boundary of the county, is being cleared and planted to corn or cotton. Deadenings, in which the trees have been killed by girdling, are a

feature of much of the type. The principal trees are willow oak, water oak, overcup oak, post oak, ironwood, black gum, and tupelo.

In practically all places it is necessary to construct lateral ditches leading into the main canals in order to obtain adequate drainage. Tiling is the most satisfactory means of draining this land, and many complete systems have been installed. The mains in most instances are 8-inch tiles, and 4-inch and 6-inch laterals are placed 50 to 100 feet apart. Tile drains apparently work properly where there is sufficient fall. Most of the canals are from 8 to 12 feet deep, so the grade as a rule is adequate.

The water table in untilled fields during the spring of 1916 could be reached with a 3-foot auger. In the summer it is much lower, except in flat areas a considerable distance from any drainage line. All this type is subject to overflow, but the water remains on the land but a short time. All the type was inundated many times during the winter of 1915–16.

The Catalpa silty clay loam is devoted exclusively to the production of corn and cotton, though the acreage of the latter has been reduced somewhat because of the presence of the boll weevil, which has damaged the late crop severely in recent years. The yield of corn ranges from 50 to 70 bushels per acre; and cotton, when the weevil is not destructive, produces one bale or more per acre. Lespedeza, Bermuda-grass, and Johnson-grass hay give large yields on this type, and clover also succeeds.

Little of this land is plowed in the fall, although such treatment is advisable. Many farmers flat break the ground and then bed up for cotton or corn, and on tiled land flat breaking and level cultivation are satisfactory. Two-horse draft, at the least, should be used in plowing land of this type. Owing to the generally high content of organic matter and lime in this soil, it tends to assume a crumb structure on drying. If handled properly, most of the type can be kept in good tilth with a moderate expenditure of labor.

The present price of this land, uncleared and lying at a distance from a canal, ranges from $20 to $30 an acre. Cleared, well-drained land may be bought for $40 to $50 an acre.

The following table shows the results of mechanical analyses of samples of the soil, subsoil, and lower subsoil of the Catalpa silty clay loam:

Mechanical analyses of Catalpa silty clay loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
423407	Soil	0.1	0.6	1.6	13.2	8.6	49.8	25.8
423408	Subsoil	.2	.6	.8	11.8	7.6	45.8	33.0
423409	Lower subsoil	.0	.2	.5	13.5	8.8	41.9	35.2

CHALK (HOUSTON MATERIAL).

Chalk (Houston material) includes the areas of white material conspicuously exposed on many of the hillsides. It represents the outcroppings of the Selma Chalk formation, where the original thin layer of soil has been removed. On the steeper hillsides these exposures usually are scarred by many V-shaped gullies, and there is a soil layer, a few inches deep, consisting of whitish, chalky silty clay with considerable fragmental rock and, in places, many fossil shells. Beneath this surface layer the limestone usually is fissured to a depth of several feet. On the gentler slopes the decomposed material is of greater depth, and has the properties of a shallow soil.

Only the larger areas of Chalk (Houston material) can be indicated on the map, and these usually include more or less Oktibbeha clay. Numerous patches of the type occur also in the rougher areas of the shallow phase of the Oktibbeha clay.

The type has some value for the pasture it affords. Melilotus and various other legumes and grasses thrive wherever the soil is deep enough. The type in places furnishes lime for agricultural use.

SUMMARY.

Lee County lies in the northeastern part of Mississippi. It has an area of 448 square miles, or 286,720 acres.

The surface for the most part is undulating to strongly rolling, and a part of the east-central section is hilly. Along the many small streams there are comparatively wide bottoms.

The principal crops are cotton and corn. About 24,000 bales of cotton and 600,000 bushels of corn are produced each year. Cattle and hogs are raised quite extensively, but are not an important source of income on a majority of the farms. Many minor crops are grown, chiefly for home use.

Excluding Chalk (Houston material), 20 types of soil are mapped. These are grouped in 12 series.

The Oktibbeha clay is a heavy soil which is productive but somewhat difficult to cultivate. A silt loam of this series also is mapped.

The Pheba silt loam and fine sandy loam are the predominating types in the uplands. Nearly all the former and much of the latter are cleared and under cultivation. The clay loam is really an eroded phase of the silt loam. The Pheba soils are used for the production of cotton, corn, and forage crops. Yields are only fair under the prevailing system of farming, but can be improved by deeper plowing, growing legumes in rotation with the other crops, liming, and manuring or fertilizing.

On the high second bottoms of streams the Kalmia fine sandy loam is the predominating soil. This type is used to some extent for cotton and corn, which give fairly good yields. The poorly drained areas of the second bottoms are occupied by the Myatt fine sandy loam and silt loam. They are imperfectly drained, and have a rather low agricultural value in their natural condition, but respond exceptionally well to drainage.

The Catalpa silty clay loam is the predominating type in the first bottoms of the larger creeks. Where artificially drained it produces good crops of cotton and corn. The Catalpa silt loam and fine sandy loam generally occur along the smaller branch streams, and are mostly in cultivation. Corn on this type yields 60 bushels or more per acre and cotton does well.

The Ochlockonee soils are the darker colored and naturally better drained soils of the creek bottoms. They are very productive, yielding 70 bushels or more of corn per acre. Cotton also does well. The Ochlockonee series is represented by three types—the fine sandy loam, silt loam, and clay.

The Trinity silty clay loam is a first-bottom soil derived from wash from the limestone soils of the upland. It is a black, granular soil of high productiveness, much esteemed for alfalfa.

The other soil types mapped are of small extent and are not important in the general agriculture of the county.

○

[PUBLIC RESOLUTION—No. 9.]

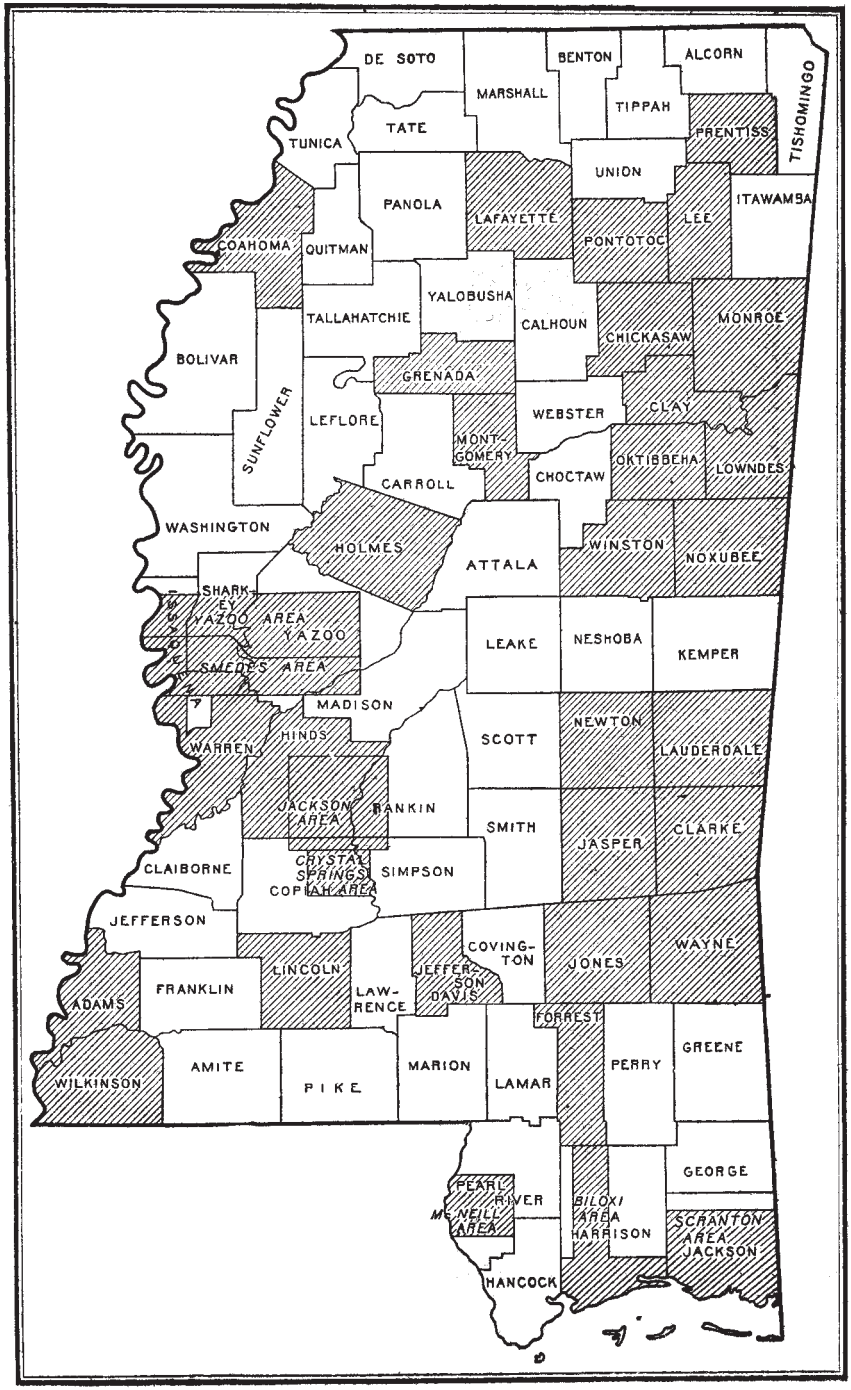
JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

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.]



Areas surveyed in Mississippi.

Accessibility Statement

This document is not accessible by screen-reader software. The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1–800–457–3642 or by e-mail at ServiceDesk-FTC@ftc.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at http://offices.sc.egov.usda.gov/locator/app.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all of its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex (including gender identity and expression), marital status, familial status, parental status, religion, sexual orientation, political beliefs, genetic information, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720–2600 (voice and TDD).

To file a complaint of discrimination, write to:

USDA
Assistant Secretary for Civil Rights
Office of the Assistant Secretary for Civil Rights
1400 Independence Avenue, S.W., Stop 9410
Washington, DC 20250–9410

Or call toll-free at (866) 632–9992 (English) or (800) 877–8339 (TDD) or (866) 377–8642 (English Federal-relay) or (800) 845–6136 (Spanish Federal-relay). USDA is an equal opportunity provider and employer.