SOIL SURVEY OF LOWNDES COUNTY, MISSISSIPPI.

By HOWARD C. SMITH, of the U. S. Department of Agriculture, and A. L. GOODMAN, of the Mississippi Geological Survey.

DESCRIPTION OF THE AREA.

Lowndes County, Miss., located slightly north of the central part of the State, is one of the eastern tier of counties bordering Ala-

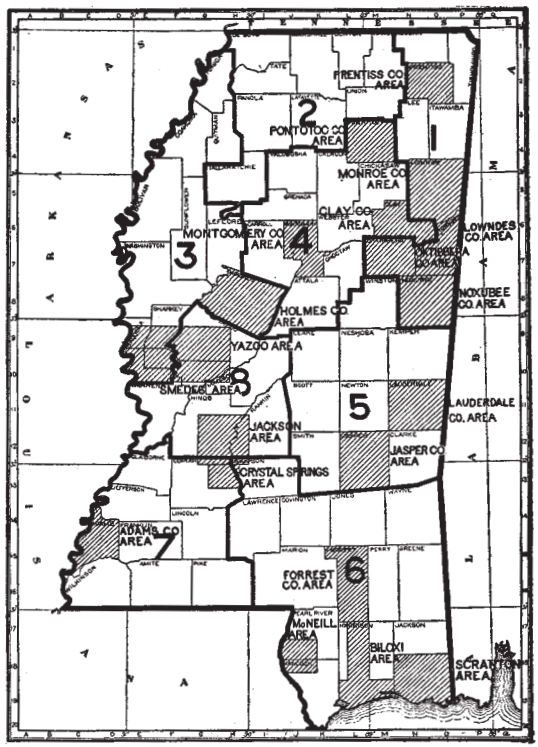

FIG. 25.—Sketch map showing areas surveyed in Mississippi.

bama. It is bounded on the north by Clay and Monroe Counties, on the east by Lamar and Pickens Counties, Ala., while Noxubee and Oktibbeha Counties form the boundaries on the south and west, respectively. The county has a maximum length of 31¼ miles and a width of 21 miles. The eastern, southern, and western boundaries are formed by right lines; the northwestern follows the irregular

course of the Buttahatchie and Tombigbee Rivers. The county comprises 510 square miles or 326,400 acres.

There are five main topographic divisions, varying widely in soils, drainage, and density of population.

The prairie upland comprises about one-third of the county, or that portion located west of the Tombigbee River. This division is characterized by a rolling to undulating country crossed by flat-topped divides sloping gradually to the flat broad bottoms of meandering streams and sloughs. Many of the smaller streams, especially in the higher parts of the region underlain by the Selma chalk, have rather deep, narrow channels. The southwestern section adjacent to Noxubee and Oktibbeha Counties is eroded and hilly. The elevation of points along the railroads are: 310 feet at Crawford, 233 feet at Artesia, and 207 feet at Mayhew. In the extreme southeast, where the Tombigbee leaves the county, the elevation is approximately 200 feet above sea level.

The prairie section is drained mainly by Motly Slough and McCowers and Gilmer Creeks, which flow into the Tombigbee River. These streams have no definite channel, and in high water the floods in places spread over a width of about 3 miles, the country resembling a timbered swamp.

A sandy upland section begins near Columbus and extends northward to Cedar Ridge School and eastward to Luxapallila Creek. Another such upland includes the northern one-fifth of the county, extending southward along the Alabama line as far as the high terrace of the Tombigbee near Union Baptist Church. The topography of these uplands varies from the broken, eroded, low hills north of Columbus to the steep, hilly regions bordering Monroe County on the north and Alabama on the east. The eastern section between Luxapallila and Nash Creeks ranges from a gently rolling surface to low rounded hills and broad crested ridges with valley sides sloping gently to broad-bottomed streams.

The other topographic divisions are of alluvial origin and include the first bottoms, the second bottoms, or terraces of older sediments, and the high terraces, with which are included scattering remnants of a fourth terrace.

The terraces border the upland and include those flat areas influenced by stream erosion and deposition during earlier time, when the streams flowed at a higher level with respect to the uplands. The division between upland and terrace is often sharp and well defined, as, for example, near Davis store, a few miles north of Columbus, or more indistinct as in some other sections. The eroded hilly upland north of Columbus, with its intricate system of hills and valleys drained by intermittent streams, is in sharp contrast to the nearly level surface of the terrace. The boundaries between the upper ter-

races and upland are so indistinct in places that the lines had to be drawn rather arbitrarily, though in most places the break between these divisions is fairly definite. The descent from the high to the lower terrace, or second bottoms, may be a gradual slope or a series of gentle steplike drops.

The drainage of the higher terrace varies from excellent to very poor. In ancient times it is believed that the waters of the Tombigbee and Luxapallila united during high water across the flat country 6 to 10 miles north of Columbus. The flat divide at Calvary Church is even now but a few feet above the high-water mark of 1892.

The lower main terrace, or second bottoms, includes those areas bordering the larger streams which are overflowed only in seasons of exceptionally high water. The surface, unlike much of the higher-lying terrace, is not eroded, but slopes very gently streamward. The width of this terrace along the Tombigbee varies from a narrow strip to nearly 4 miles. On the Luxapallila this terrace is narrow and developed mainly on the eastern side. The second bottoms of the Buttahatchie are either narrow, entirely lacking, or displaced by the high terrace.

The first bottoms are developed in two types. In the southwestern portion of the county the flatness of the prairie region renders the streams sluggish, meandering, and wide-bottomed. McCowers Creek, draining about 75 square miles of the prairie region, is an example of this type of drainage. To the east of the Tombigbee River the soils are prevailingly sandy, so that much of the rainfall is absorbed, making the run-off more gradual than in the region of predominant clay soils to the west of that stream. Here there are not so many intermittent or wet-weather streams as on the west side of the river, and the bottoms are somewhat narrower. The flood bottoms of the Buttahatchie, Luxapallila, and a part of Yellow Creek are strikingly narrow as compared with the size of the streams.

The county developed rapidly. In 1837, seven years after it was founded, the population had increased to 12,857. Of these 7,362 were negroes and 5,495 white. Columbus had a population of 3,500 and was an important river port. The mild climate, fertile soils, and river transportation to seaboard markets were three conditions favoring early settlement. The present population consists almost entirely of the descendants of the original white settlers and negroes. There has been no immigration of the European races. Since 1860 the growth of population has been very gradual, being dependent on the development of the agricultural resources. In 1900 the population was 29,095, of which 7,121 were white and 21,974 colored. No marked increase has taken place since then, the population of 1910 being 30,703.

Since 1907 considerable numbers of northern residents, attracted by the opportunities for the production of alfalfa and allied crops on the Houston and Trinity soils, have made extensive purchases in the black-land belt. No portion of the county is fully settled, and many valuable tracts of land await cultivation.

Columbus, the county seat, with a population of 8,987, is located almost in the center of the county. It is a thriving, modern city, the seat of several important industries. Here are located the largest brick plant and sawmill in this part of the State and one of the largest greenhouses in several States. Cut flowers are shipped to cities within a radius of several hundred miles. The State Industrial Institute, a woman's school, annually enrolls more than 1,000 students from all sections of the State.

The Southern Railway of Mississippi gives quick service to the markets of Birmingham, 123 miles to the northeast, and Greenville, 168 miles westward on the Mississippi River. This road also offers shipping facilities for the northern and central portions of the county from Columbus, Flynn, and Steens. The Aberdeen and Tombigbee Valley Railroad from Okolona, Miss., to Pensacola, Fla., is now under construction and when completed will greatly improve conditions in northern Lowndes County.

The Mobile & Ohio Railroad has 31 miles of track in the county and offers an outlet to the New Orleans markets, 296 miles distant, to Memphis, 180 miles to the north, and to Birmingham. On this system McCrary, New Hope, Columbus, McIntyre, Bentoak, Billups, Artesia, Penn, Crawford, and Mayhew are so located as to give convenient shipping points to the southern, western, and central parts of the county.

The main public roads are systematically worked and for the most part kept in good condition. Supplies of gravel convenient to most parts of the country have resulted in an unusual degree of improvement, and a movement is under way to issue bonds for new construction and betterment.

The Tombigbee River traverses the county for an air-line distance of 28 miles, which is increased to nearly 40 miles by the numerous bends. This river was formerly of much importance to commerce. With the completion of the railroads river transportation decreased, although light-draft freight boats make occasional trips to Columbus. Projected legislation plans to restore navigation by river improvement.

The county has nearly thirty rural free delivery routes, so arranged that nearly all farms are served daily. A number of telephone lines are used by both city and country residents. An excellent system of graded schools is maintained for both races throughout the county.

Water for commercial and domestic use is exceptionally pure and easily obtained. Throughout the limestone regions shallow wells

are not common, because the water is here unpalatable from the high content of lime. In this section recourse is had to drilled wells, an abundance of good water being found at depths of 150 to 600 feet. Many of these are flowing wells, some discharging a 4-inch stream. There are also numerous mineral springs in the county. The artesian water is suitable for irrigation, and the nearby sandy lands may some day be irrigated and utilized in the production of truck and specialized crops.

Lowndes County has immense deposits of sand, gravel, and limestone, useful for road making, ballast, and cement manufacture. Clay is readily available for brick making. The Selma chalk underlies over 100 square miles of the county and in places is suitable for Portland cement. It may also be ground and applied to the land, as is done in the cooperative farmers' mills in nearby counties. Many of the above industries, while not directly connected with agriculture, will become important factors in local development.

CLIMATE.

The average winter temperature of Lowndes County, as shown by the records of the Weather Bureau station at Columbus, is 45° F. The range of temperature for the season is from below zero to 75° F., but the extremes are rare and of short duration. The ordinary winter weather consists of brief periods of clear days and frosty nights, with the possible formation of thin ice, followed by warmer weather with day temperatures ranging from 45° to 65°, with a drop to 35° to 40° at night. This may be followed by a general rain and clear, cold weather completing the cycle of change. The soil during winter may at times freeze to a depth of 2 to 3 inches, but does not remain in this condition for any length of time.

The winter rains come from the south and are usually steady and prolonged. The average precipitation for the three months is 14 inches. But little snow falls. The bottoms along the smaller streams are often overflowed, but along the larger streams they are flooded only occasionally. The temperature and rainfall favor fall and winter plowing. During the latter part of February the weather becomes milder and usually permits the sowing of oats or the planting of Irish potatoes. March usually has the greatest rainfall, the mean being over 6 inches. This is sufficient to flood the bottom lands and saturate the soil with moisture. This excess, however, normally is removed in time for the completion of spring planting before the middle of April.

The average temperature of 54° F. for March increases to 61° for April and 72° for May. For June, July, and August the mean is nearly 80° F.; on 40 or 50 of the summer days the temperature exceeds 95°, but temperatures higher than 100° F. are almost unknown.

From the records kept at Columbus it will be seen that the date of last killing frost in spring ranges from March 16 to April 17, giving an average of March 30. Early fall frosts may be expected after the middle of October. The average for the first frost in fall is October 29. These figures give a growing season of approximately 208 days, although, as shown by the table, there may be great variations from year to year. The average season for the tenderest plants is therefore about 7 months. Hardier pasture grasses keep in good condition for a month longer.

Cattle may be pastured 9 months in the year, and many farmers allow stock to graze on Bermuda or switch cane the year round. On the whole the climate favors stock raising and poultry raising.

September, October, and November are the driest months, with an aggregate rainfall of 8 inches. This is particularly favorable for the maturing and harvesting of the cotton crop. Cotton is seldom beaten out or stained by fall rains in this section of the State.

The percentage of sunshiny days in winter is relatively high, which, with the mild temperature, enables the numerous greenhouses in Columbus to grow plants and flowers very profitably. Winter vegetables can also be grown outdoors by exercising a little care during the colder periods.

The following tables give climatic data for Columbus:

Normal monthly and annual temperature and precipitation at Columbus.

Month.	Temperature.	Precipitation.	Month.	Temperature.	Precipitation.
	° *F.*	*Inches.*		° *F.*	*Inches.*
January	44.3	4.52	August	81.5	4.30
February	44.7	5.23	September	75.9	2.64
March	54.8	6.62	October	63.5	2.15
April	61.8	4.25	November	53.3	3.46
May	72.2	3.54	December	45.4	4.69
June	80.2	4.25	Year	63.3	51.00
July	82.3	5.35			

Dates of first and last killing frosts at Columbus.

Year.	Last in spring.	First in fall.	Year.	Last in spring.	First in fall.
1900	Apr. 1	Nov. 9	1905	Apr. 17	Nov. 30
1901	.....	Nov. 6	1906	Mar. 22	Oct. 11
1902	.....	Oct. 28	1907	Apr. 14	Oct. 29
1903	.....	Oct. 25	1908	Mar. 21	Oct. 25
1904	Mar. 29	Oct. 23	1909	Mar. 16	Oct. 13

Average date of latest frost in spring for 7 years, April 26. Average date of earliest frost in fall during 10 years, October 27. Length of growing season, 7-year average, 208 days.

AGRICULTURE.

That portion of northeastern Mississippi east of the Tombigbee River, and included in the terms of the second Choctaw cession, was the first to be settled. The "black prairie" belt west of the Tombigbee did not come into possession of the white man till 1830, or by the terms of the third Choctaw cession. The early settlers found the broad alluvial bottoms and adjacent uplands covered with a dense virgin forest. The black prairie, with some scattering trees, produced a rank growth of grasses and sedges. In the early days a more diversified agriculture was practiced than at present.

The main reason for the early and rapid settlement was the cutting of the military road from Nashville, Tenn., to New Orleans, about 1817 to 1820, by Gen. Jackson. This served not only to make the county accessible, but to advertise the advantages of soil and climate. Again, the ease of transportation down the Tombigbee to Mobile, and thence to the markets of the world, was an important factor in early agricultural development. Light-draft boats plied between Columbus and other ports, exchanging cotton, corn, and wheat, beef and pork, and other lesser farm products, for merchandise and supplies needed by the rapidly increasing population.

Differences in soils of the prairie belt on the western side of the Tombigbee and the sandy lands to the east were early responsible for the development of two widely different types of agriculture in the county. The great fertility, level topography, and ease of clearing the large areas of prairie soils led to the development in this section of large slave-holding plantations. These plantations ranged in size from 1,000 to 10,000 acres, and were usually improved with large manor houses, each surrounded with numerous cabins for the laborers. These plantations were as a rule well cared for, and evidenced the prosperity so common at that time.

In the part of Lowndes County east of the Tombigbee the surface was more broken, and the sandy lands were less fertile and less desirable for farming on the large scale used in the prairie section. Here the farms were small, and while some labor was employed, the greater proportion of the farms were operated by the owners.

The prairie belt at first produced more corn, hogs, and meat than cotton, wheat, and oats. Owing to the great fertility of the virgin Houston soils cotton made an excessive growth of stalk at the expense of fruit, while oats and wheat often lodged. Consequently these crops were confined mostly to the Oktibbeha clay and sandy soils. Later, with a gradual diminution of the organic matter, the Houston clay was utilized more for the general farm crops. During this early period lands that had temporarily declined were permitted

to lie fallow or grow up to weeds, new ground being cleared each winter.

The first bottom soils, because of the annual additions of fertile deposits from overflows, have been cultivated for nearly three-quarters of a century with little or no decline in the yields. The Houston and Oktibbeha clays have not shown any great diminution in productivity where erosion has not been severe. Areas of Houston clay farmed continuously for nearly 80 years still produce profitable crops of cotton, corn, Johnson grass, and other crops. Yields have diminished considerably on some areas, chiefly on account of the failure to prevent erosion and to keep the soil properly supplied with organic matter. Fields have too generally been used continuously for clean cultivated crops, under which system very little vegetable matter is returned to the soil, but in the main the prairie soils have maintained their productiveness in a remarkable degree.

A gradual improvement is taking place in the agricultural practices of the county, cowpeas and other legumes are being grown in rotation with other crops, better plowing is being done, and along other lines there are striking evidences of improvement, so that even those areas that have deteriorated under carelessness or neglect may be expected to regain their original productiveness.

The live-stock industry does not hold the importance it had in the earlier days of settlement, but, especially on the prairie soils, which are peculiarly fitted for the production of alfalfa and other forage crops, there is no reason why the raising of live stock should not be made profitable. Until recently nearly all the work stock used in the county has been purchased from States farther north. A good team of mules costs $400 or more, and they can be raised at a profit on the heavier clay loam or clay soils at least as an adjunct to other lines of farming. In recent years many of the planters have begun raising mules and there are a number of valuable jacks in the county. There is need of heavier work animals on the heavier soils and breeders should keep this fact in mind.

The importation of blooded cattle has heretofore been hazardous on account of the presence of the Texas-fever cattle tick, and although the soils are well adapted for the production of pasturage they have not been much utilized for this purpose. The eradication of the tick is now receiving attention, and its success will enable the introduction of improved breeds of dairy and beef cattle. There has been considerable improvement in the breed of hogs, the Poland-China and Duroc-Jersey bloods having largely displaced the razorback variety.

Cotton and corn are planted on ridges or beds as formerly, but in same cases the beds are placed 5 or 6 feet apart to give room for cowpeas or peanuts between. In the prairie region the land is usu-

ally bedded in January, the soil in most cases not being turned deeper then 2 or 3 inches. In the sandy lands the soil is plowed to greater depth. Subsoiling has been found advantageous in the comparatively few instances where it has been tried in the prairie section.

Although cotton and corn lands receive much the same preparation before planting, irrespective of the nature of the soil, quite a number of farmers have lately improved upon the old methods. The prevalent practice is to bed the land and plant on a high ridge. This is done on the heavy, well-drained uplands, the droughty Cahaba sand, or the wet Kalmia or Ocklocknee series, without any regard to the different requirements of the several types of soil. Cotton often sheds its fruit in a dry season, especially on shallow prepared land. Farmers often complain that cotton is "slow in coming through" and that it does not "grow off" well. On the heavy soils this is often due to retarded germination caused by the cold nature of the soil. On such soils the seed bed should be thoroughly pulverized and the seed planted not deeper than 1 or 2 inches.

A number of farmers use the check-row planter for corn, planting on flat rows, and subsequently cultivating so that the soil is thrown about the plants, leaving them finally on a ridge with a deep, well-pulverized root zone. Moisture conditions are likely to be satisfactory where this plan is conscientiously followed. On poorly drained soils good results are secured by throwing up a bed wide enough for two rows of corn. This plan renders possible the use of a two-row planter and double-row cultivator.

The census of 1900 showed 4,317 acres of oats which yielded 30,130 bushels, or approximately 7 bushels to the acre. This production is probably below the present output, as there is little doubt that the yields now average nearly double this amount. On very wet soils oats should be sown in the spring, for if fall sown they are apt to be killed during the winter months. On well-drained soils fall-sown oats give the best average yields, doing particularly well after corn or cowpeas. The crop follows cotton with fair results, but the cotton is apt to be removed too late for the best yields. Under boll-weevil conditions, which are likely to obtain at an early date, cotton is usually picked much earlier, and oats may then be sown in time to secure a growth large enough to withstand the winter weather. The Texas Rustproof is grown and little attention is paid to adapting the variety of crop to the soil type. The Appler and Bancroft varieties should be tried.

Not enough corn is grown in Lowndes County to supply the local demand, the farmer paying from 60 cents to $1 a bushel for corn that could be home grown for 20 to 30 cents a bushel. The tenants, as a rule, devote all their time to cotton and work their corn when they have nothing else to do. More attention should be paid to cultivation

and seed selection. The Georgia Red Cob has succeeded very well, especially on the poorer soils. The Mosby variety is a general favorite and the majority of farmers at one time or another have purchased pure-bred seed of this variety. Very few give it the careful attention necessary to maintain the quality. The average yield of corn per acre has increased during the last 20 years.

Until within the past 15 or 20 years farmers paid little attention to cotton varieties. This question has recently been given more consideration, although the particular soil adaptation of the different varieties has not been investigated as it should be. Some of the improved strains now grown are Cook's Improved, King, Cleveland Big Boll, and Triumph. Early-maturing varieties should generally be selected for the late clay and silty soils. The late varieties are forced to earlier maturity on the warmer sandy soils.

Among the less important crops grown may be mentioned Irish and sweet potatoes, sorghum (for fodder and sirup), sugar cane (for sirup), peanuts, lespedeza, Bermuda grass, Johnson grass, alfalfa, and garden vegetables.

There is an abundance of soil well suited to Irish potatoes. Two crops may be easily grown in a single season. The well-drained loams and sandy loams are probably best for the early crop, and the loams and silt loams, owing to better moisture conditions, for the fall crop.

Sorghum can be profitably grown for both green[1] and dry forage. Mixed sorghum and cowpeas grown together make good hay. Sorghum is usually considered an exhausting crop. Any bad effects can undoubtedly be avoided by growing the crop in rotation with the legumes, oats, corn, etc.

Peanuts are grown to a limited extent between the rows of cotton and corn, not as a commercial crop, but as a forage crop for hogs. This crop adds nitrogen and organic matter to the soil, and the hogs in rooting for the nuts give the soil a good stirring. The land should not be grazed when wet enough to be miry.

Sugar cane, for the manufacture of table sirup, is produced on nearly every type of soil, except the Houston, Ocklocknee, and Trinity clays and the Catalpa silty clay loam. The cane is planted in furrows 5 to 6 feet apart and liberally supplied with fertilizer high in nitrogen. Little stable manure or muriate of potash is used, as

[1] Sorghum may be fed green to all kinds of stock, even to poultry, with profitable results. A full feed should not be given at first, particularly if the animals are hungry. It is a good practice to give first a light feed of grain or other food and then a small amount of the sorghum. The quantity of the latter may be increased day by day until a full ration is reached. Fresh sorghum is a very succulent forage, and, like clover, is liable to cause bloating in cattle when fed in too large quantities at first. With ordinary precautions no trouble from this source need be feared. (See Farmers' Bulletins 246 and 288.)

these tend to give the sirup a dark color and unpleasant flavor. Side applications of nitrate of soda (about 200 pounds per acre) when the crop is about half grown have been followed with profitable results.

The color and texture of the soil type govern to a great degree the color and flavor of the sirup. Expert boilers can detect the sirup produced on the heavy, reddish Oktibbeha clay, or the dark-colored clays, by the darker color of the product. The best sirup is secured from the sandy soils having a yellow or brownish subsoil. Well-flavored, light-colored sirup often retails at 65 to 75 cents per gallon. There are good opportunities for a profitable extension of this industry.

Peaches, figs, pears, summer apples, and Scuppernong grapes are successfully produced for home consumption. There is plenty of soil well adapted to these fruits as well as to most of the vegetables, and therefore little excuse for the importation of such products. In fact, vegetables particularly could be profitably shipped by farmers owning well-drained sandy soils situated near shipping points. The Yates, Harvest, Carolina June, Yellow Transparent, Red June, and Shockley apples are all adapted to the climate and the well-drained soils. They grow well and mature quickly.

Pears do well, but are injured by the blight, for which there is at present no effective remedy, though it can be checked by vigorous pruning of affected wood. It is necessary to cut below the blighted parts with disinfected tools. Only blight-resistant varieties like the Kieffer and Garber should be planted, and then only on the thinnest soils and without fertilizers. Efforts should be made to secure a slow, stocky growth, for the reason that a rapid growth of sapwood makes the trees more susceptible to blight.

Figs thrive on all the well-drained soils. The common varieties can not be shipped, but can be grown for local use and for canning or preserving on a commercial scale.

There are small peach orchards on many farms. Chinese Cling, an old established variety, does especially well, although it is not as popular as the Sneeds, Greensboro, Carman, or Elberta. The Ruston and Orangeburg soils are well adapted to peaches, particularly in areas occupying the ridges or sloping to the south and west. In Lauderdale County, 90 miles south of Columbus, the Orangeburg sandy loam is being successfully used for growing the Elberta variety on a commericial scale. Peach trees begin to bear at about 3 years and usually live from 10 to 15 years.

The Scuppernong grape is found on almost every farm, especially on the sandy lands. At present other grapes are imported from Ohio and New York, although the Moores Early, Lutie, and Niagara could be grown on the well-drained uplands. Little attention is given the

matter of pruning and spraying fruit trees; much better results would be had with a little more care in this direction. There are many valuable publications issued by the United States Department of Agriculture and the experiment stations that give detailed instructions on handling fruit trees and grapevines.

The sandy terrace and upland soils give good results with pecans. The trees will grow on the heavy wet bottoms, but a quicker and more profitable growth may be secured on well-drained sandy lands.

Dewberries and blackberries thrive on nearly every type, growing wild in profusion nearly everywhere in uncultivated fields. These berries could be cultivated profitably for shipment.

Good gardens with a great variety of vegetables are easily had. Some of the hardier vegetables, such as turnips and collards, can be grown through the winter. The supply of watermelons and cantaloupes is always sufficient to supply the local markets. They do well on all the well-drained loam and sandy loam soils.

The wide extent of soils adapted to grass and forage crops enables the county to produce a surplus of hay. Lespedeza, white clover, melilotus, alfalfa, Johnson and Bermuda grass, cowpeas, soy beans, and clover and a number of wild grasses do well on the several types of soil to which they are adapted.

Johnson and Bermuda grass are often regarded as pests in cultivated fields. Nevertheless both these grasses supply good grazing and make valuable hay crops. The former yields 1 ton per acre per cutting, of which two are secured each year. The first crop sells for $8 to $10 per ton; the second, being freer from weeds, brings from $10 to $15 per ton, baled, f. o. b. Johnson grass does best on the Houston, Trinity, Ocklocknee, and Oktibbeha soils. Among the grasses there is no better soil binder for the slopes in this section subject to erosion than Bermuda, and it should be grown more generally for this purpose. These grasses thrive so well under the local conditions of soil and climate that eradication was long thought impossible. They can, however, be kept in check or killed out by close grazing, shallow plowing, and shading with thick-growing crops, such as cowpeas and melilotus.[1]

During the last 5 years gratifying success has been reported in the commercial production of alfalfa on the Houston clay. Many farmers from northern States, attracted by the mild climate and cheap lands, as well as native farmers, have purchased and seeded considerable areas to alfalfa. Since there is a large area adapted to its culture, the industry is constantly assuming larger proportions. There already exists a tendency to grow this crop to the exclusion of other products. It must be borne in mind that in many older established regions of alfalfa production greater profits follow the

[1] See Farmers' Bulletins Nos. 279 and 102.

raising of hogs, mules, beef, or dairy cattle in connection with alfalfa growing than where the sale of the hay is solely depended upon. From 6 to 10 hogs per acre may be pastured on alfalfa without seriously diminishing the yield. Many farmers graze the fields during the winter, although it is questionable whether this is a practice to be encouraged.[1]

Among the less important legumes lespedeza (*Lespedeza striata*) is the most plentiful. It was introduced before the Civil War and has spread to nearly every soil type in the county. Its presence is desirable in hay meadows, as it produces a perfect stand by growing in vacant places and, mixed with other grass, forms a better balanced ration. Melilotus is another legume thriving upon the calcareous Houston, Trinity, and Oktibbeha soils. It will give two cuttings a year and if mowed when young, before the stems become woody, makes a fair quality of hay. It is also excellent as a bee-pasture crop, blooming in midsummer, when there is a dearth of flowering plants.

Many farmers understand the importance of soil adaptation to different crops. The Houston and well-drained phases of the Trinity soils are recognized as excellent for alfalfa, corn, soy beans, and grass. The adaptation of the Ruston and Norfolk silt loams to oats is universally recognized. These soils and the heavier Oktibbeha soils were once successfully used for wheat, but the crop for a long time was practically abandoned in this region. Recently it is receiving some attention and may again have an important place among the crops of the area.

The tendency toward greater diversification of crops and more intensive methods of cultivation is bringing about a better system of soil management. In this connection one or two suggestions may be made. The heavy clay soils should be plowed in the fall in order to subject the material to the beneficial effects of winter rains and frosts. In general, deeper plowing and in many cases subsoiling is needed on the upland soils, particularly those having a compact clay subsoil within 12 or 14 inches of the surface. Shallow cultivation of the crops should be practiced, and cultivation should be more frequent in order to maintain a pulverulent mulch, which materially assists in conserving moisture for the use of the growing crops. The present practice of shallow breaking and deep aftertillage followed by many farmers is decidedly objectionable. Many of the feeding roots are destroyed by the latter. Much more of the moisture stored in the seedbed is lost by exposing the deeper material than where 1 or 2 inches only are stirred in cultivating. Much more moisture is stored in the deep-plowed soil.

[1] For more complete discussion of alfalfa growing on the soils of this region see Report No. 96, U. S. Dept. Agr., Soils of the Prairie Region of Alabama and Mississippi and their use for Alfalfa.

In some sections, especially the sandy uplands, the farmers follow a fairly good rotation, in which cowpeas are sown between corn rows, followed by cotton and then corn. This is sometimes varied by introducing a crop of oats or cowpeas sown broadcast for hay. A rotation embodying the desirable aims of soil improvement as tried in various of the cotton States consists of corn, followed by fall-sown oats, then by cowpeas, to be cut in the fall for hay. If the land is subject to erosion or is badly in need of humus, as much of the land of Lowndes County is, a winter cover crop of oats should follow. The spring of the third-year cotton may complete the rotation.

The growing of these four crops in three years, each crop having a different root system and different effect on the soil, and the including of cowpeas, a valuable humus-supplying crop, greatly increases the productiveness of many of the upland soils of the county. Other crops can be profitably included in the rotation, particularly the legumes, such as lespedeza, soy beans, melilotus, and bur clover.

The beneficial effects of humus or decaying vegetable matter on the soil are becoming more and more recognized, but commercial fertilizers are extensively used for cotton on the upland soils. Usual mixtures for the sandy lands analyze 10–2–2 or 8–2–2, and cost from $20 to $24 a ton. Variable results are had with these mixtures, depending largely upon the nature of the soil and its humus and moisture content. Gains from fertilizer applications seem to be relatively higher in dry seasons than in years of excessive rainfall. Some farmers say that their soils need only cotton seed or cottonseed meal, while others mix the meal with acid phosphate alone or acid phosphate and potash salts. A good mixture for cotton, corn, and cane on the sandy loam soils consists of 200 pounds cottonseed meal, 200 pounds acid phosphate, and 100 pounds kainit. This should be applied at the rate of 500 pounds per acre. Lighter applications suffice for oats and peanuts. Apparently the deeper the covering of sandy soil over the clay subsoil the greater the quantity of potash required. The heavier soils seem to give better results with fertilizers containing a relatively high content of phosphoric acid. The quantity of nitrogen necessary in fertilizer mixtures can be materially reduced by growing legumes.

Nitrogenous fertilizers are necessary on soils that have been much used and had their organic-matter content considerably reduced. On rich cotton lands producing a rank, green, sappy growth, phosphatic fertilizers are needed to encourage fruiting and to force the ripening of the bolls.

In view of the admirable adaptation of large areas of land to a variety of winter and summer forage crops stock raising should be gradually extended in connection with general farming. Hogs, cattle, and mules can be profitably raised over much of the county,

especially where important places in the crop systems are given to the production of cowpeas, alfalfa, melilotus, Johnson grass, Bermuda grass, sorghum, peanuts, bur clover, lespedeza, soy beans, and vetch.

SOILS.

Lowndes County lies wholly within the Gulf Coastal Plain Province. The material from which its soils are derived are therefore all water deposited.

The soils fall naturally into four well-defined main divisions; (1) upland soils derived from calcareous, old sedimentary material; (2) upland soils from noncalcareous, old sedimentary material; (3) stream terrace, or second-bottom soils lying principally above overflow and composed of old alluvium; and (4) first-bottom, overflow soils consisting of recent stream alluvium.

In the first division there are two series, viz, the Houston and Oktibbeha. The Houston soils represent the residual products resulting from the decay of the "rotten limsetone" (Selma Chalk), a soft bluish-gray limestone underlying most of that portion of the county west of the Tombigbee River. These soils exist under prairie conditions and are famed for their fertility and durability.

The Oktibbeha soils are the brownish timbered soils ("post-oak land") associated with the Houston. They are less calcareous than the Houston soils, but often have a moderately high lime content, especially as compared with the other upland soils of the region, except the Houston, and are underlain by rotten limestone at depths of 3 to 16 feet. The clay, silt loam and fine sandy loam members of this series were encountered in the survey of Lowndes County. These soils are quite productive under good management, but are not naturally as strong as the Houston soils.

In the second division the Orangeburg, Norfolk, Ruston, Guin, and Susquehanna series were mapped. These soils are largely confined to that part of the county east of the Tombigbee River. The clay, silt loam, fine sandy loam, and gravelly sandy loam types are represented in this division of the uplands. The topography of these soils varies from flat to gently rolling. Washing has been active in some of the more rolling situations, but over much of the flat silt loam types there has been little recent erosion.

The Orangeburg series is characterized by the gray color of its soils, the red color, friable structure, and sandy clay texture of the subsoils, and by the good natural drainage and power of conserving moisture. These soils differ essentially from the Norfolk soils in the subsoil color, the latter having bright yellow subsoils. Agriculturally the Orangeburg soils are a little stronger than the corresponding types of the Norfolk series.

The Ruston types have gray surface soils and yellowish-red subsoils. They occupy a position intermediate between that of the Orangeburg and Norfolk series, particularly as regards the color of the subsoils.

The Guin gravelly sandy loam is a badly eroded type having a prevailingly grayish soil and reddish subsoil. It includes patches of Ruston and Orangeburg soils too small to map on the scale used in the present survey.

In the first bottoms of streams four series of soils were recognized. The basis of differentiation here includes the character of the original material and the degree of weathering since the deposition of this material. The Trinity clay owes its determining characteristics—a black color and calcareous nature—to the calcareous prairie soils of the region (mainly Houston clay) from which this type has been washed. On the other hand, the Catalpa silty clay loam is characterized by its gray color and calcareous nature, due to the freshly deposited material washed from nearby exposures of the grayish rotten limestone underlying the prairie belt.

The brownish Ocklocknee soils are derived from the various soils of the drainage basins of the streams along which they are developed. The material consists very largely of wash from noncalcareous upland sedimentary soils, chiefly Norfolk, Orangeburg, Ruston, and Susquehanna. These Ocklocknee soils have undergone more or less weathering since their deposition, notwithstanding the fact that they are overflowed nearly every year and are added to by each inundation. This is evidenced by the fact that the associated Bibb soils, consisting of the same original deposits as the Ocklocknee, and occupying flat, depressed situations in which much poorer drainage obtains between overflows than in case of the Ocklocknee soils, have a gray to almost white color, the direct result of poor drainage and consequent lack of oxidation in the material.

There is a less well-defined line of demarcation between the soil and subsoil in the first-bottom lands for the reason that the frequent additions of stream-deposited material tend to prevent translocation of the finer particles toward the subsoil, as is generally the case in the uplands, where each heavy rain carries downward some of the finer particles through the pore space, with no chance for this material to be returned to the surface or to be replenished in the surface soil by subsequent addition of material.

The second-bottom soils have been formed of essentially the same material as the Ocklocknee and Bibb soils, but were deposited at an earlier stage in the development of the drainage systems; that is, before the streams had cut their channels to the present level. These soils, standing largely above overflow, have undergone more complete weathering where drainage conditions have not prevented than the better drained first-bottom soils.

The Cahaba series, with its brown surface soils and reddish-brown subsoils, holds an intermediate position in degree of weathering between the recent alluvial Ocklocknee and the old upland sedimentary Orangeburg soils. In other words, the weathering of the Cahaba material has advanced to a point very much ahead of the Ocklocknee; oxidation has penetrated its subsoil, although not so far as in the Orangeburg soils, where the drainage is still better and oxidation has been active for a much longer time in its role of changing the conditions of the component materials. It is true that some of the very best drained portions of the Cahaba—those areas near bluff lines—where the drainage is most complete can scarcely be distinguished from the Orangeburg either in character of material or color of the subsoil. This advanced stage of weathering in the old-stream-terrace soil simply strengthens the contention that degree of weathering and consequent oxidation have played a highly important part in bringing about the physical differences between the terrace and upland soils of this region.

In the uplands there has been greater opportunity for the translocation of the finer particles from the surface soil downward. As a matter of fact, the Cahaba soils contain more fine material and usually have a more loamy feel than the Orangeburg soils of the same class.

The Myatt soils, occupying very poorly drained situations on the terraces, closely resemble the Bibb soils of the first bottoms.

The members of the Kalmia series occupy an intermediate position between the Myatt and the Cahaba soils with respect to drainage. The subsoil color is predominantly yellow, although grayish mottling is frequently seen.

The type mapped as Meadow (Ocklocknee material) includes very poorly drained first-bottom soils in which there is such a textural variation as to make differentiation impracticable.

The following outline shows the relation of the soils to one another:

Upland soils from highly calcareous sedimentary material (Selma Chalk).	Black soil, gray subsoil.	Houston clay.
	White partially weathered "rotten limestone."	Houston chalk.
Upland soils from only slightly calcareous sedimentary material.	Brown soils, mottled yellowish-brown, gray and red subsoils.	Oktibbeha clay.
		Oktibbeha silt loam.
		Oktibbeha fine sandy loam.
Upland soils from noncalcareous sedimentary material.	Gray soil; red friable subsoil.	Orangeburg fine sandy loam.
	Gray soil; yellow friable subsoil.	Norfolk silt loam.
		Norfolk fine sandy loam.
	Gray soils; yellowish-red friable subsoils.	Ruston silt loam.
		Ruston fine sandy loam.
	Gray soil, reddish subsoil, broken topography.	Guin gravelly sandy loam.
	Reddish soil, mottled red and yellow plastic subsoil.	Susquehanna clay.

First-bottom soils from recent stream alluvium, incompletely weathered and frequently overflowed.	Found under relatively good drainage conditions.	Derived from calcareous soils.	Black soil—Trinity clay.
			Gray soil—Catalpa silty clay loam.
		Derived from noncalcareous soils; brown soils.	Ocklocknee clay.
			Ocklocknee silt loam.
			Ocklocknee fine sandy loam.
	Found under poor drainage conditions.	Gray soils	Bibb silt loam.
Second-bottom soils from old stream alluvium above overflow.	Found under good drainage conditions.	Brown soils; reddish-brown subsoils.	Cahaba clay.
			Cahaba silt loam.
			Cahaba fine sandy loam.
			Cahaba sand.
	Found under intermediate drainage conditions.	Gray soils; yellow subsoils.	Kalmia silt loam.
			Kalmia fine sandy loam.
	Found under poor drainage conditions.	Gray soils	Myatt silt loam.
			Myatt fine sandy loam.
Undifferentiated first-bottom soil of variable textural and structural characteristics and profile arrangement very poorly drained.	Meadow (Ocklocknee material).		

The characteristics of the individual types are brought out more fully in the succeeding chapters, where also the agricultural value, crop adaptation, and cultural and manurial requirements of the several types are discussed.

The following table gives the names and extent of the various soils of the county:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Oktibbeha clay	52,608	16.8	Meadow	6,912	2.1
Erosion phase	2,112		Orangeburg fine sandy loam	6,272	1.9
Cahaba fine sandy loam	33,280	14.5	Norfolk fine sandy loam	4,864	1.5
High terrace phase	14,016		Myatt silt loam	4,672	1.4
Houston clay	37,056	11.4	Oktibbeha fine sandy loam	4,416	1.4
Trinity clay	27,904	8.5	Catalpa silty clay loam	3,968	1.2
Ruston fine sandy loam	24,896	7.6	Bibb silt loam	3,264	1.0
Kalmia fine sandy loam	3,072	5.2	Houston chalk	2,944	.9
High terrace phase	14,144		Ocklocknee clay	2,880	.9
Norfolk silt loam	16,192	5.0	Ocklocknee silt loam	2,880	.9
Ocklocknee fine sandy loam	12,672	3.9	Myatt fine sandy loam	2,752	.8
Ruston silt loam	12,032	3.7	Cahaba clay	2,688	.8
Kalmia silt loam	3,146	2.5	Susquehanna clay	1,664	.5
High terrace phase	4,992		Guin gravelly sandy loam	1,472	.5
Cahaba sand	8,000	2.5	Oktibbeha silt loam	768	.2
Cahaba silt loam	5,312	2.4			
High terrace phase	2,560		Total	326,400	

HOUSTON CLAY.

The Houston clay, to an average depth of about 8 inches, consists of a dark-gray to nearly black clay, crumbly when moist and exceedingly sticky and plastic when wet; underlain by a plastic adhesive clay or silty clay. The latter is uniformly lighter colored than the soil, becoming drab or gray at about 30 inches. At depths ranging from 4 to 8 feet is found the partly decomposed grayish rock from which the soil material is derived.

The granular structure of the dry soil is due to a high content of lime, which causes flocculation of the soil particles. Small lime concretions and occasionally fragments of the original rock are present in the surface soil and subsoil. Small iron concretions locally called "buckshot" are also found, especially in wet areas.

On knolls where erosion has been active the soil is sometimes so thin that the partially weathered parent rock comes near enough to the surface to give the surface a grayish color. There are some noticeable patches of this sort near Penn. Near the line of contact with the associated Oktibbeha soils the Houston and Oktibbeha material is sometimes so mixed as to make it difficult to locate the lines of separation. To the northeast of Crawford the rotten limestone is reached in places at 2½ to 3 feet. On land of this sort crops are more likely to suffer in dry spells than where the rock lies at greater depths. Near Artesia there is a tract of perhaps 250 acres where a mixture of Oktibbeha material has given rise to a decidedly loamy phase of the Houston clay.

The Houston clay is mainly confined to the western part of the county, only a few areas being found east of the Tombigbee. Important areas are located south of McCowers Creek, around Artesia and east of Mayhew. This soil lies for the most part within 10 miles of shipping points, an important factor in marketing such bulky crops as alfalfa. Where the soils are exclusively Houston and Oktibbeha the latter usually cap the low, flat-topped knolls and are surrounded by the Houston, which prevailingly lie at lower levels. The Houston clay, however, may often be found at a higher level than the Oktibbeha clay.

Though local differences of elevation, varying from 30 to 50 feet, are not uncommon west of Columbus and in the regions adjacent to Noxubee and Oktibbeha Counties, the Houston clay areas are rarely hilly. The topography is for the most part rolling to undulating and favorable to surface drainage, which, except in small areas about the heads of streams, is uniformly good. The subsoil is darker in such poorly drained places and often has a faint bluish tinge.

The nearly level areas have not been noticeably eroded, although the type has been washed badly in comparatively small areas along

some of the steeper slopes. Most of the areas where erosion of the limestone has been execessive are mapped as the Houston chalk.

The Houston clay, locally known as "black prairie," is derived from the underlying soft, impure, bluish limestone which is geologically known as the Selma Chalk and locally as rotten limestone.

Occasional thickets of wild plum, ash, hackberry, and cedars are found on the knolls, and cottonwood in the poorer-drained spots, but the type is true prairie and supports no forests. Numerous roadside hedges of bois d'arc have been established. The type was originally covered by native grasses. At present lespedeza and Johnson grass grow abundantly and a species of grass known as paspalum (*Paspalum dilatatum*) has spread over large areas. Melilotus is also common along roadsides and is often sown for forage. White clover, which is esteemed as a valuable early pasture plant, thrives with little attention.

Cotton has always been the main crop. Much of this soil is held in large plantations, which are farmed by tenants in tracts of 25 to 40 acres. The tenants are mainly negroes, who plant all the cotton they can care for, putting the remainder of their land in corn. From one-half to two-thirds of a bale of cotton and from 15 to 20 bushels of corn are considered fair yields under the ordinary methods.

North of Crawford Johnson grass, lespedeza, Bermuda, paspalum, and some broom sedge are cut for hay. Two cuttings are secured. The average yield is 1 ton per acre at each cutting, the second crop being much more valuable. This hay has a feeding value approaching that of timothy, and sells readily for $10 to $15 a ton. Large areas have been given over to Bermuda grass, which is the best pasture obtainable the year round. Paspalum grows well on the uplands of both the Houston and Oktibbeha clays, is a valuable hay and forage plant, and seems to be crowding out the older established grasses. Carpet grass (*Paspalum compressum*) grows well in damp locations and is valuable for pasturage. Melilotus succeeds splendidly on this soil. It thrives even on badly eroded areas and there is no better crop for building up such washed land. Under good conditions 3 tons per acre are secured. The hay is relished by cattle and finds a ready sale.

The Houston clay is a very durable soil. Many fields, continuously cultivated to intertilled crops for nearly 70 years without addition of fertilizers, are still producing profitably. At present much of the type is in a rather poor physical condition, owing to loss of humus under severe usage. This condition very likely can not be entirely remedied by the use of commercial fertilizers. The greatest need seems to be vegetable matter and the legumes should be given a more important place in the rotations practiced. These will supply needed

organic matter and prove otherwise beneficial. Oats sown in the fall and followed in June by Mammoth yellow soy beans will put the soil in good condition for cotton, corn, and other crops. Sowing New Era or Whippoorwill cowpeas between corn or cotton at laying-by time is also a good practice. Much attention is being given to alfalfa, which does well where properly handled. An occasional failure to secure a stand can be charged generally to failure to eradicate weeds before seeding, to crusting of the soil after seeding, or to need of inoculation. The land should be freed of weeds by cultivation to clean cultivated crops or crops to be plowed under as a source of organic matter. Crusting will not be so likely to follow a liberal incorporation of vegetable matter. A pulverulent seed bed should be secured by repeated harrowing and the soil inoculated by addition of 400 or 500 pounds of soil from an old alfalfa field. The seed after being carefully tested for germination should be sown at the rate of 25 to 30 pounds per acre. If fall seeding is practiced, a full crop may be secured the following year, but it is considered more hazardous because of danger from winter freezes and washing. From the middle of March to early in April is the best time to sow. With spring-sown alfalfa one cutting may be secured in September if the soil is in good condition. From three to five cuttings are usually secured, yielding a total of 2½ to 3½ tons per acre for the season. With a soil so well adapted to grasses Bermuda is apt to encroach upon the alfalfa fields. When the yields of hay are reduced, the field should be plowed and planted to corn. Under these conditions the following crops will show a great increase, the soil will be darker, more friable and easier to till, owing to the increase of humus. The land may again be seeded to alfalfa after a few years' cropping to intertilled crops. The average cost of a first seeding is from $7 to $10 an acre.[1]

The Houston clay is also well suited to such winter pasture crops as rye, oats, vetches, bur clover, and rape, velvet beans, soy beans, and corn for both grain and ensilage.

In 1900 this type sold for $8 to $10 an acre. The average selling price is now $35 to $40 an acre and advancing steadily. From $2.50 to $5 an acre is asked as cash rental. Some landlords lease their land for 50 pounds of lint cotton, which at recent prices is equivalent to about $7.50 an acre, while others rent on a share basis. Land in alfalfa rents for $10 to $15 an acre.

This type is a very valuable soil. The yields ordinarily secured can easily be increased, especially in the case of cotton and corn.

[1] For further discussion of alfalfa production on this soil see Report No. 96, U. S. Dept. of Agriculture, Soils of the Prairie Region of Alabama and Mississippi and their use for Alfalfa.

HOUSTON CHALK.

The Houston chalk includes areas, formerly Houston clay, where the surface soil has been washed away and the underlying rotten limestone exposed. In some places there is a thin covering of grayish chalky material over the more compact limestone. The type is badly gullied and in its present condition is of little agricultural value. It supports an occasional cedar, hackberry, cottonwood, or plum tree, and in some places Johnson grass, lespedeza, and melilotus have encroached upon it. Much of this land can be reclaimed by growing and plowing under melilotus and lespedeza. With such treatment much of the soil can be brought to a state where it will produce a number of crops profitably, and nearly all of it could be reclaimed for the production of hay or for pasturage. The areas locally known as "lime hills" certainly should not be allowed to increase in size because of lack of effort to check erosion. Fortunately, there is not an extensive area of the Houston chalk. It is developed as isolated patches throughout the prairie section of the county.

It is believed that the soft calcareous material exposed in the Houston chalk areas could be used advantageously for liming some of the poorly-drained lands, which are likely to be in an acid condition, and even on the Oktibbeha soils its use would doubtless prove profitable.

OKTIBBEHA CLAY.

The Oktibbeha clay, to an average depth of 6 to 8 inches, is a dingy-brown to faintly reddish brown, rather stiff clay, underlain by a light yellowish brown, stiff, heavy clay, extending to a depth of 30 inches and mottled with streaks of dull yellow, gray, and red. This soil is sticky when wet and difficult to till, except under proper moisture conditions, when it assumes a slightly granular structure. Red and gray mottling in the subsoil is more conspicuous and iron concretions more abundant in the poorly drained areas than on the knolls. In the latter position the drainage is better and the red color is more pronounced in both soil and subsoil. The knoll areas, because of surface erosion, are somewhat less productive than the remainder of the type. Near the border of the Houston clay the two soils are more or less mixed.

The Oktibbeha clay is the most extensive soil type west of the Tombigbee River. The larger proportion of it is located within 10 miles of shipping stations, a fact of importance when its adaptability to bulky crops is considered.

The type appears to represent the residual product of a formation overlying the Selma Chalk, but this point has not been definitely decided by geologists. The depth to the rock is estimated to range from 2 to 18 feet.

The topography varies from flat to gently sloping. Characteristically the type occupies flat-topped or moderately sloping drainage divides. The surface drainage is normally adequate, except in the flatter areas and depressions. As the soil is heavy and contains relatively little vegetable matter, the absorption of water is slow, and in heavy rainfalls a great proportion of the water runs off, with constant erosion and loss of surface soil. The soil is capable of absorbing much water and giving it up slowly to plants. This important feature enables the type to withstand a protracted drought, provided the surface is frequently cultivated to a depth of about 2 inches. The subsurface drainage is not good and the subsoil is often acid.

The virgin soil supports a heavy growth of black-jack oak, post oak, red oak, hickory, some pine, gum, cedar, dogwood, and hackberry. Much of it has been cut over and now supports a growth of scrubby oak, persimmon, and pine. Broom sedge, lespedeza, Johnson grass, white clover, paspalum, Bermuda grass, and several species of coarse innutritious sedges are found in uncultivated areas of deficient drainage.

Much of the type was cleared prior to 1850 and at one time produced good crops of wheat, oats, corn, and cotton. The early yields are reported to have been large, but they were very probably no better than those now obtained from newly cleared land. The loss of surface soil through erosion and the depletion of the organic-matter supply, the latter resulting from failure to rotate crops and from the continued growing of clean-cultivated crops, have considerably lowered the producing capacity of most fields. At present one-fourth to one-third bale of cotton, 20 bushels of oats, and 15 to 20 bushels of corn per acre are considered average crops. A few farmers have doubled the above yields by adopting better methods. Two cuttings of Johnson grass of 1 ton each are easily secured. The late crop is of superior quality, as it contains a smaller proportion of weeds. Lespedeza was formerly grown for hay and seed and does very well on this soil. Only the volunteer crop is utilized at present. White clover is conspicuous in early spring pastures. Red clover was seen growing very successfully on a few farms. On a limited area yellow trefoil forms a good cover crop and gives winter pasturage. Good grazing is also secured during the winter months from Dwarf Essex rape and crimson clover. A mixture of rape with crimson or red clovers would make a profitable crop for winter. Vetches are also very satisfactory crops and should be given a larger acreage. Bermuda grass affords considerable pasturage during the warmer part of the year. This grass could be utilized in connection with an extension of stock raising. More oats and wheat should be grown. With good culture 40 to 50 bushels of oats and 25 bushels of wheat per acre have been produced.

Deeper plowing and subsoiling have been found of marked benefit in cotton culture. Cotton on fields prepared in this way resists the droughts not uncommon in this section during August much better than where the land has been listed into ridges and the middles left unbroken until cultivation begins. Humus-restoring rotations, accompanied by liming, will also increase the absorptive power of the soil and improve its working qualities. A good rotation is corn with cowpeas or soy beans between the rows, followed by winter oats, a crop of cowpea hay—seed sown in June—and then by a cover crop. This should be plowed under in March and cotton planted. One advantage of this rotation is that it gives four mature crops in three years and two green crops for soil renovation or winter pasture.

Alfalfa has been successfully grown on this soil, especially where the underlying rotten limestone lies near the surface. With liming and inoculation the acreage suited to the crop can be greatly extended.

Near Penn there is an orchard of Kieffer pears that has produced good crops. It is slowly succumbing to the blight. Peaches and summer apples do well, considering that no care is given them. The Chinese cling is an old-established variety and succeeds better on this type than those maturing later. The production of fruit on a commercial scale should probably not be attempted. Sweet corn, tomatoes, collards, and cabbage succeed very well. Root and tuber crops do not develop as well as on the sandier soils. Vegetables raised on this type are later than on the sandy soils.

The Oktibbeha clay is a soil that can be readily improved and easily maintained in a high state of productivity. This soil is mainly owned by a few individuals who rent to negroes. On this account it is not in as good condition as would be the case if the operators had more direct interest in the maintenance of the productiveness of their farms. Land values are rapidly advancing, owing to the rise in price of the near-by Houston clay. With modern methods of soil management the land should continue to enhance in value. At present it sells for $18 to $30 an acre.

Erosion phase.[1]—A number of relatively small areas of an eroded phase of the Oktibbeha clay were mapped in the prairie belt. This phase represents areas in which the Oktibbeha material has been washed away, exposing in small patches the calcareous substratum (Selma Chalk), so that small bodies of Houston clay and Houston chalk have been developed in such intricate association with the Oktibbeha clay that the types could not be satisfactorily mapped separately on the scale of 1 inch to 1 mile. In these areas the Oktibbeha clay probably predominates. There are a few patches of sandy Oktibbeha soil, but they are of little importance owing to their small extent.

[1] Includes some Houston clay and Houston chalk.

These areas occur on slopes where washing is still active and will likely continue unless immediate provision is taken to stop it by seeding to soil-building crops, such as Johnson grass, lespedeza, and melilotus. By utilizing those areas most exposed to erosion for these crops the washing could be largely stopped and the land at the same time profitably used for hay and pasturage. The larger and more nearly level patches of Oktibbeha clay and Houston clay could be, as many of them are, used for cultivated crops, but the more sloping areas should be put in permanent pasture, at least until a soil capable of maintaining itself, under proper cultivation, against ruinous erosion is secured.

OKTIBBEHA SILT LOAM.

The Oktibbeha silt loam consists of a light-brown, sometimes grayish, rather compact silt loam, underlain at a depth of 8 or 10 inches by a yellowish-brown silty clay loam, which quickly grades into yellowish-red or reddish-yellow, stiff silty clay, mottled, especially in the lower portion, in some places with yellowish brown and red, and in others with gray, yellow, and red.

The type is of limited extent, occurring typically in nearly flat areas, most of which are timbered chiefly with post oak and hickory. It is somewhat easier to plow than the Oktibbeha clay. It needs organic matter, however, to lessen its tendency to run together and bake. Fair to good yields of cotton and corn are secured, especially with moderate fertilization.

It is well suited, under good management, to the crops mentioned, as well as to oats, wheat, cowpeas, soy beans, Johnson and Bermuda grass, lespedeza, bur clover, vetch, Irish potatoes, and cabbage.

OKTIBBEHA FINE SANDY LOAM.

The soil of the Oktibbeha fine sandy loam ranges from a light-brown loam to a grayish-brown fine sandy loam, with an average depth of about 8 inches. This passes gradually into a yellowish-brown to yellowish-red silty clay, rather stiff, but not very plastic. Not infrequently the lower subsoil is mottled with gray and red colors. In many cases the sandy soil has been entirely washed away, leaving clay gall spots in the fields.

The soil is typically developed near Mayhew. Scattered areas are found elsewhere, those in the southwestern part of the county showing more red and being more plastic in the subsoil. Erosion has brought about local variations over small patches, mainly through the removal of the former sandy surface soil. Like the other Oktibbeha soils, the type is underlain by the Selma Chalk formation. The topography is rolling and the drainage uniformly good.

Cotton does well on this type, and under boll-weevil conditions it should prove a good soil for this crop, as its excellent drainage conditions favor early maturity. Peanuts, watermelons, and vegetables do well. A large pear orchard near Mayhew, largely of the Kieffer variety, did not seem to be suffering badly from blight. Pears planted on the poorer eroded slopes, where a slow growth is made, appear more resistant to this disease than on more fertile areas.

Commercial fertilizers are not ordinarily used on this soil, but the best farmers plow under green crops occasionally and apply what barnyard manure they can secure. By keeping the soil liberally supplied with vegetable matter good yields are easily obtained. The type is valued at $15 to $20 an acre.

ORANGEBURG FINE SANDY LOAM.

The Orangeburg fine sandy loam consists of 6 to 10 inches of a grayish or reddish-gray fine sandy loam, underlain by a bright-red friable sandy clay. The soil is mellow in structure and can be safely tilled under a wide range of moisture conditions.

The largest areas of this type are found near the Monroe County and Alabama State line, with scattering patches elsewhere. At Caledonia the type is rather silty, and these areas, with other silty knolls a few acres in size, were included in the fine sandy loam. Near Vaughns Church there is a small patch with a red surface soil. This, if of sufficient extent, would be classed with the Greenville soils. Iron-cemented sandstone is found on the crests of some hills, and small gravel patches are not uncommon.

The Orangeburg fine sandy loam occupies the crests of ridges and tops of hills. At present washing is active, and the roads frequently cross the type through rather deep cuts with nearly vertical walls.

This type has good drainage and crops grow rapidly on it. It is well suited to cotton, corn, oats, forage crops, a number of vegetables, and peaches. With favorable freight rates there is little doubt that the commercial production of peaches, particularly the Elberta, could be profitably carried on.

The luxuriant growth of wild grape suggests the adaptation of the type to this fruit. The Concord, Lutie, and Scuppernong varieties would likely succeed.

By keeping the soil well supplied with vegetable matter, as can be easily done by growing cowpeas, vetch, or bur clover in rotation with other crops, and by using moderate quantities of commercial fertilizer, there would be no trouble in producing from three-fourths to 1 bale of cottton per acre on the smoother areas of this soil. Corn under good soil treatment should easily give upward of 40 to 60

bushels and oats 40 to 50 bushels per acre. An acreage application of 200 pounds of cottonseed meal, 200 pounds of acid phosphate, and 100 pounds of kainit, mixed, has given very good results with cotton and corn. A smaller application of the same mixture is often used profitably for oats. Cowpeas give good crops of hay and improve the soil wonderfully. Some areas are washing badly. This should be checked by terracing or seeding to Bermuda grass. This type ranges in price from $10 to $20 an acre.

NORFOLK SILT LOAM.

The soil of the Norfolk silt loam, to a depth of 6 to 8 inches, is a grayish to light-brown friable silt loam. It is easily cultivated when in the proper moisture conditions—that is, when not sufficiently wet to be miry. The subsoil is a yellow heavy silt loam to silty clay loam. In the lower portion it is sometimes sparingly mottled with gray and shades of brown and red, especially in the poorer drained flat areas and near the line of contact with the Ruston and other soils having reddish subsoils. There are many gravelly patches where water-worn quartz gravel is encountered in both the soil and subsoil.

The Norfolk silt loam is confined to the eastern portion of the county, being most extensively and typically developed in the vicinity of Caledonia. The topography varies from flat to gently undulating, the slope being often insufficient for good surface drainage. There are a number of sloughs, narrow, winding incipient drainage ways, and shallow depressions through the type. Some of the flatter areas closely resemble the Kalmia silt loam of the higher stream terraces, both in surface features and character of the soil material. While these soils grade imperceptibly into each other in places, there is occasionally a well-defined drop from the Norfolk to the Kalmia.

With the exception of the Houston clay probably a greater proportion of this type is cultivated than of any other extensive soil in the county. The uncleared areas support a growth consisting principally of shortleaf pine, oak, gum, and persimmon. Pine grows very rapidly on this soil, quickly covering abandoned fields. Lespedeza, broom sedge, and Johnson grass afford good pasturage for a few years in uncultivated fields or until they are crowded out by the encroachment of pine.

This soil is generally well handled and profitable crops are the rule. Many farmers practice good rotations. Cowpeas are frequently sown between corn at laying-by time. The succeeding year cotton is planted, then fall oats, and a crop of cowpeas the following year. The important point in crop rotations is to include an occasional legume, as cowpeas, bur clover, or vetch.

Both sorghum and ribbon cane are successfully grown, the sorghum being cut occasionally for forage.

The ordinary acreage yields are from three-fourths to 1 bale of cotton, 20 to 40 bushels of corn, 20 to 40 bushels of oats, and 1 to 2 tons of cowpea hay. As high as 75 bushels of corn and twice the ordinary yield of oats can be secured in years of good seasonal conditions. Cane sirup averages about 200 gallons per acre, although 500 gallons are sometimes secured. This soil is well suited to Irish potatoes, and yields of 200 bushels have been reported. The crop, however, is not grown commercially. Sweet potatoes are grown for home use and yield well.

Fertilizer mixtures prepared on the farm are used by a number of farmers. The common acreage application for cotton and corn consists of from 200 to 400 pounds of a mixture of 16 per cent acid phosphate with cottonseed meal in about equal parts. Many farmers say that potash fertilizers are unprofitable. For sugar cane 300 to 500 pounds per acre of a mixture of acid phosphate and cottonseed meal is used by the best farmers. Such applications are frequently supplemented by 150 pounds of nitrate of soda per acre, made when the crop is about waist high.

The poorly drained, flatter areas should be ditched to insure better surface and underdrainage. An application of one ton of burned lime per acre would also improve the condition of such areas after they have been properly ditched.

The usual price of the Norfolk silt loam is $30 to $50 an acre.

NORFOLK FINE SANDY LOAM.

The Norfolk fine sandy loam consists of a gray to grayish-brown loamy fine sand to fine sandy loam, underlain at about 8 to 14 inches by yellow friable fine sandy clay.

Typical areas are developed about 3 miles south of Caledonia and in the vicinity of Mount Zion Church, 7 miles southeast of Columbus. The Kalmia fine sandy loam of the old stream terraces in its better-drained development is quite similar in character of soil to this type. It is, however, more nearly level and not so well drained. The Norfolk fine sandy loam is confined to the uplands, where it usually has an undulating surface, though it includes some flat areas and slight depressions, in which drainage is only partially established. In such situations there is sometimes a slight mottling of gray in the subsoil. The better-drained areas are timbered with shortleaf pine and a sprinkling of elm, oak, gum, and dogwood. Pine grows very rapidly on this soil, quickly taking hold in abandoned fields. The poorer-drained areas, especially the incipient drainage ways, support a growth of gum, pin oak, water oak, and willow.

The Norfolk fine sandy loam is considered a valuable soil, especially for cotton and corn. Many fields have been severely used, in consequence of which the yields are low. The type can be improved by plowing under an occasional crop of cowpeas, rye, or oats to supply needed organic matter. As the drainage is good, crops reach maturity rapidly, and this soil, like the other well-drained upland sandy soils of the area, will be especially valuable for cotton where the boll weevil is present.

Melons, cantaloupes, strawberries, beets, turnips, radishes, and sweet and Irish potatoes reach maturity early and give good yields when properly fertilized. Peanuts do well on this soil and should be more extensively grown, especially as a field forage crop for hogs.

The ordinary acreage yields are approximately 25 bushels of corn, one-third bale of cotton, and 30 bushels of oats. These yields could be doubled easily by growing occasional crops of legumes and by moderate applications of fertilizers. Mixtures of cottonseed meal and acid phosphate in the ratio of 2 to 1 give good results with most of the crops suited to this soil. From 75 to 100 pounds of kainit per acre is usually advisable. Sugar cane, as well as other crops, requires heavier applications than in the case of the Norfolk silt loam.

RUSTON SILT LOAM.

The Ruston silt loam consists of a light-brown to yellowish-brown silt loam, underlain at an average depth of about 10 inches by a dull-red or yellowish-red moderately friable silty clay. Occasional patches of quartz gravel occur on the surface and throughout the soil section. The soil should not be cultivated when wet enough to be miry, as puddling and baking are likely to ensue.

Aside from an area some 5 square miles in extent to the south of Luxapallila Creek, the most important areas lie within 4 miles of Caledonia. The topography of the type is somewhat hilly in the northeastern part of the county, and in other locations it is moderately rolling. The drainage is good, although not excessive.

Pine, oak, and dogwood constitute the principal timber growth of the uncleared areas. Uncultivated areas support a growth of wild grasses that afford considerable pasturage.

The type is very well suited to corn, oats, sorghum, and cotton. The average yields are a little below those of the Norfolk silt loam. About the same treatment is suggested for this soil as was advised for the Norfolk silt loam. The land would be improved by including the legumes in rotation with other crops, and also by fall plowing, followed by a winter cover crop of rye, bur clover, vetch, or oats. Fertilizers are required for best results.

RUSTON FINE SANDY LOAM.

The Ruston fine sandy loam consists of 8 to 12 inches of a gray to grayish-brown loamy fine sand to light fine sandy loam, underlain by a moderately friable fine sandy clay, varying in color from dull red to yellowish red and slightly mottled with gray in the lower portions of the subsoil, where drainage is poor. The type is easily tilled under a wide range of moisture conditions, and owing to its texture is not inclined to bake or clod.

The most important area extends from Columbus in a northeasterly direction for a distance of about 6 miles. Other isolated areas are developed to the east of the Tombigbee River. The topography varies from rolling to low hilly. Some areas have been gullied considerably by erosion. The characteristic timber growth consists of pine, oak, dogwood, elm, gum, and persimmon. The drainage is very thorough and in some cases excessive. To prevent erosion, some of the most sloping areas should be terraced or used for Bermuda pasturage. The incorporation of vegetable matter enables the soil to conserve moisture in sufficient quantities to supply the needs of crops through ordinary dry seasons. In some sections the soil has been much improved, mainly by growing humus-supplying crops in rotation with general farm crops.

The yields per acre range from one-fourth bale to 1 bale of cotton, 10 to 40 bushels of corn, and 15 to 40 bushels of oats. Probably one-third bale of cotton, 20 bushels of corn, and 20 bushels of oats would represent the average for the county. Higher yields are secured by fertilization and good soil management. Sorghum and sugar cane are grown for home supplies of sirup. They succeed best on the slightly moist depressions or along slopes where there has been more or less accumulation of colluvial material. The sugar cane is liberally fertilized with commercial fertilizers, supplemented by a later side application of sodium nitrate. The yields of sirup range from 200 to 450 gallons per acre, depending upon the seasons and the quantity of fertilizer used.

Peaches and certain varieties of summer apples were seen in several places. A portion of the type probably could be profitably used in growing Elberta peaches for shipment.

Owing to the good drainage conditions, early vegetables do well. Crops reach maturity early on this well-drained soil. With the advent of the boll weevil this land will probably be more highly prized for cotton, since with proper management at least a fair crop can be made before the weevils become plentiful enough to do much damage.

This soil generally is in need of organic matter, and it is absolutely necessary for best results that an occasional crop of cowpeas

or some other legume be turned under. Moderate to liberal applications of fertilizers are required for heavy yields. The quantity of nitrogen necessary can be considerably reduced by growing leguminous crops in rotation with the general farm crops. The fertilizer treatment suggested for the Norfolk fine sandy loam would apply to this soil.

SUSQUEHANNA CLAY.

In its typical development the Susquehanna clay consists of a reddish-brown stiff clay, which grades quickly into a heavy plastic red clay, mottled with yellow and gray. In some places there is a thin surface soil of silty clay loam, but such material is rapidly washed off when the land is brought under cultivation. The soil is difficult to break on account of the intractable nature of the subsoil, which usually lies within reach of the plow.

This is not an extensively developed soil, being found only in small areas occupying slopes and hills. It is little used for agriculture, being considered a hard soil to manage and not very productive. It is best suited to shallow rooted crops, such as the small grains and grasses.

GUIN GRAVELLY SANDY LOAM.

The typical Guin gravelly sandy loam consists of about 10 inches of a gray to grayish-brown gravelly sandy loam, underlain by a brownish or reddish sandy loam to reddish clay loam, sometimes mottled with gray. The depth of soil varies considerably throughout the type. Those areas having a clay loam subsoil are quite closely related to the Susquehanna series. Ferruginous sandstone is present in small fragments, larger plates, and bowlders on the surface and throughout the soil section.

Most of this type occurs near the Monroe County line. The topography is hilly to broken, there being many narrow, winding ridges. This rough topography and stony character makes it unsuitable for cultivation. The type includes small areas of Orangeburg and Ruston fine sandy loam too small to be mapped. These soils, however, are farmed in some places. Most of the type is timbered with oak and pine. It is best suited to Bermuda pasture and forestry. Peaches and pears could be successfully grown in a few places.

TRINITY CLAY.

The Trinity clay consists of a nearly black to black heavy clay, usually becoming lighter in color in the lower portion, where it may be faintly mottled with different shades of brown. The high lime and organic matter content tend to give the soil a fair degree of friability when dry. When wet it is decidedly sticky and can not be cultivated except under favorable moisture conditions. On drying the soil falls apart in small aggregates. This fact, together with

the presence of iron concretions, gives rise to the local name of "buckshot land."

A few areas were included with this type which occupied somewhat higher levels than the typical soil, being developed in situations that correspond closely to second bottoms. These, however, were relatively small in extent and were not differentiated from the main type, which occupies first bottoms on the flood plains of streams. Along McCowers, Gilmer, and James Creeks and Motly Slough the subsoil is quite like the characteristic Ocklocknee material, suggesting that Ocklocknee soils have been covered by wash from the Houston soils, perhaps since the beginning of cultivation.

There are a number of narrow upland drainage ways which carry water during heavy rains, becoming dry soon afterwards. Along some of these there have been developed strips of Trinity clay too narrow to be separated from the Houston clay.

The Trinity clay consists largely of material washed from the Houston clay. Along the larger streams, however, it contains varying quantities of material derived from the Oktibbeha and other soils of the several drainage basins. Nearly always enough lime has been derived from the Houston clay, Houston chalk, or exposures of the Selma Chalk to give the soil a calcareous nature. This is evidenced by the tendency of the material to crack into small aggregates on drying.

This is a highly productive soil, capable of producing year after year without the addition of any kind of fertilizer heavy yields of corn, cotton, Johnson grass, and, where protected from overflow, alfalfa. One bale of cotton per acre and 65 to 75 bushels of corn should be secured with very little trouble. Cotton makes a large growth and is somewhat inclined to go to weed at the expense of fruiting, suggesting the need of acid phosphate to hasten maturity. The crop is likely to be severely damaged by the boll weevil when it reaches this section. Cotton sometimes suffers from "rust." An application of 200 pounds of kainit per acre is said to be quite efficacious in preventing this disease. Bermuda, lespedeza, and Johnson grass can be grown with very little trouble and give heavy yields. Success with alfalfa will be determined largely by the drainage conditions. In all cases the land should be given thorough underdrainage by ditching or tiling and should be protected from heavy overflows by diking or by straightening and deepening the stream channel. Timbered areas support a characteristic growth of cottonwood, willow, and gum. The type is valued at $15 to $30 an acre.

CATALPA SILTY CLAY LOAM.

The Catalpa silty clay loam in its typical development consists of a gray to dark-gray moderately friable silty clay loam, underlain

at about 10 or 15 inches by sticky silty clay of a brownish or mottled color. In places the subsoil is quite dark, consisting largely of Trinity material.

This soil is somewhat variable in character and is developed in narrow strips of stream bottoms usually contiguous to outcrops of the Selma Chalk or near areas of the derivative soil type, Houston chalk. It represents comparatively fresh outwash of this light colored calcareous material upon usually a darker colored bottom-land soil. The type passes gradually into the Trinity clay. It is adapted to about the same crops as the latter type, good yields of corn, alfalfa, and Johnson grass being secured. Cotton is not generally grown, owing to a tendency to rust.

The type lies generally a little higher than the Trinity clay and consequently has better average drainage. Its greatest need is organic matter, particularly in places where the color of the soil is lightest. In its present condition it is more or less droughty. Melilotus, lespedeza, or soy beans could be plowed under to good advantage.

The following table gives the results of mechanical analyses of samples of the soil and 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.*
422047	Soil	0.9	1.0	0.9	7.9	6.9	60.3	21.8
422048	Subsoil	.6	1.1	.6	4.8	6.0	59.6	27.0

The following samples contained more than one-half of 1 per cent calcium carbonate ($CaCO_3$): No. 422047, 30.18 per cent; No. 422048 18.13 per cent.

OCKLOCKNEE CLAY.

The Ocklocknee clay consists of a brown to dark-brown, usually rather plastic clay or silty clay, ranging from 6 to 10 inches in depth, underlain by a light-brown or yellowish-brown plastic clay, frequently mottled with brown and occasionally gray colors. Small iron concretions are plentiful in both the soil and subsoil.

The Ocklocknee clay is developed in the stream bottoms and is subject to overflow. The material is washed mainly from the soils of the region other than the calcareous prairie soils. There is considerable variation in the color of the materials and also in the drainage conditions. In some places it passes into the Trinity clay so gradually that the placing of boundaries is difficult. Some areas have good drainage, except when overflowed, while in the depressions and on slopes it ranges from poorly drained to swampy. In the sloughs where water stands or the land remains in a very wet condition throughout the year the soil ranges from drab to black, with

more or less yellow or reddish-yellow mottling. The subsoil here is quite plastic and bluish colors are usually found.

Much of the type is timbered with water oak, pin oak, post oak, cypress, hickory, willow, birch, bay, magnolia, and an undergrowth of shrubbery, cane, and blackberries. Some areas were so inaccessible that the soil boundaries had to be drawn rather arbitrarily.

This is a very productive soil, being particularly suited to Johnson grass, Bermuda grass, corn, and cotton. Crops are occasionally damaged by overflows, but in other years very good yields are secured. As in the case of the Trinity clay, cotton is inclined to grow strongly to weed, and probably would be benefited by applications of phosphoric acid. Yields of 50 bushels of corn or more per acre are frequently made without fertilization.

This land is valued at $10 to $20 an acre, depending upon location and drainage conditions.

OCKLOCKNEE SILT LOAM.

The Ocklocknee silt loam consists of a grayish-brown to dark-brown friable silt loam, moderately rich in organic matter, underlain by a light-brown to yellow silt loam or silty clay loam, mottled with rusty brown. The subsoil frequently includes strata of lighter textured material. The soil is easily worked and kept in good tilth. Strips of this soil occur along some of the larger streams of the county. They occupy first bottoms and are often subject to overflow. The material has been derived from the noncalcareous upland soils of this section. The greater proportion of the type is timbered with gum, oak, willow, holly, bay, and hickory. Considerable good pasturage is afforded by wild cane.

Protected from overflow and given proper drainage by straightening and deepening the stream channels and by cutting cross ditches, the soil is admirably adapted to corn, Johnson grass, cowpeas, and cotton, of which good yields may be secured with little or no fertilization.

OCKLOCKNEE FINE SANDY LOAM.

The Ocklocknee fine sandy loam is typically a light-brown fine sandy loam to loamy fine sand, having a comparatively open structure, underlain by a grayish brown to yellowish silty loam to silty clay, including frequent strata of material quite different in texture. Grayish mottling is often noticeable in the poorer-drained areas, while iron concretions are of common occurrence through the soil and subsoil. These concretions indicate generally very poor drainage.

The type is somewhat variable in texture. It is developed in the first bottoms of the larger streams, especially along Magby and Cooper Creeks. It is derived from the sandier upland soils of the region, although some small included areas are quite silty in character and would have been mapped as a distinct type could they have

been satisfactorily separated. The drainage is usually poor, the areas being subject to overflow. Most of them are timbered with oak, gum, bay, magnolia, and willow; beech, water maple, redbud, and cypress are conspicuous in the sloughs. Wild cane affords good pasturage over considerable areas.

With good drainage, which can be had by deepening and straightening the stream channels and leading ditches into them, the type can be profitably utilized in the production of cotton, corn, oats, cowpeas, Johnson grass, peanuts, sugar cane, sorghum, and a number of vegetables. Moderate applications of fertilizers are advisable on the more sandy areas. Yields of 200 to 400 gallons of sugar-cane sirup are secured with moderate applications of cottonseed meal, acid phosphate, and nitrate of soda.

MEADOW (OCKLOCKNEE MATERIAL).

The type mapped as Meadow (Ocklocknee material) comprises first-bottom, poorly drained, overflowed areas, consisting of alluvial material similar to that giving the Ocklocknee series of soils, but is so variable that differentiation into types could not be accomplished with any degree of satisfaction. In texture it ranges from quite sandy to silty. Characteristic areas are developed on Bonny Slough, Greens, Bluff, and Stinson Creeks, and other small branches east of the Tombigbee River. It is mainly timbered with the same tree species as are found on soils of the Ocklocknee series.

This soil could be profitably utilized by improving the drainage conditions through deepening and straightening the stream channels and running ditches across the fields. Corn, oats, cotton, Johnson grass, lespedeza, sorghum, sugar cane, and cowpeas could be successfully grown.

BIBB SILT LOAM.

The Bibb silt loam is an ashy-gray to drab, floury silt loam, 5 inches deep, underlain by a gray silt loam or silty clay loam, frequently mottled with yellowish and rusty brown colors, and often containing thin strata of material of various textures. Iron concretions are usually present in the subsoil.

A few areas of the type have a perceptibly sandy texture, though even here the soil has a sufficiently high content of silt to be a decided silt loam, and it is doubtful whether the presence of this sand differentiates the phase sufficiently from the typical soil to effect any important difference in the agricultural value of the land. The main body of this phase is developed on Magby Creek.

This type is developed in the first bottoms of streams and is subject to overflow. It has essentially the same source as the Ocklocknee soils, its characteristic appearance having been brought about by the poor drainage, mainly the result of a flat or depressed surface. It is a cold soil and suited in its present condition only to pasturage.

Various water-loving grasses and lespedeza do well on the type. Its drainage could be improved by ditching, making it available for the production of corn, oats, forage crops, and possibly sugar cane. Applications of lime and acid phosphate would likely prove beneficial in the production of such crops.

There are only small areas of this soil in the county.

Mechanical analyses of samples of the soil and subsoil of this type taken from the sandier areas gave the following results:

Mechanical analyses of Bibb 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.*
422043	Soil	0.5	4.0	9.4	19.5	5.4	53.8	6.7
422044	Subsoil	.4	4.0	11.4	20,2	6.1	44.7	13.0

CAHABA CLAY.

The Cahaba clay is a brown to brownish-red silty clay loam to silty clay, underlain at about 6 inches by a reddish-brown to dull-red silty clay of a moderately friable structure. The lower portion of the subsoil is occasionally mottled with gray and yellow, especially in the poorly drained areas.

The type is of limited extent, occurring in scattered areas on the second bottoms or terraces of the Tombigbee, Buttahatchie, and Luxapallila and lying mainly above overflow. The material composing this soil was washed from the uplands of the region and deposited over the flood plains when the streams were flowing at higher levels. With the better drainage condition resulting from the cessation of overflows and the lowering of the stream channel, the soil has been more completely oxidized than the first-bottom soils.

The Cahaba clay is a very productive soil, though it occasionally needs moderate applications of fertilizers. It is well suited to cotton, corn, cowpeas, oats, and various grasses. It is believed that fall plowing and the growing of an occasional winter cover crop to be plowed under would enhance the productive power of these soils.

The results of mechanical analyses of samples of the soil and subsoil of this type are given in the following table:

Mechanical analyses of Cahaba clay.

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.*
422023	Soil	0.0	0.1	0.8	3.4	3.3	66.0	26.4
422024	Subsoil	.0	.2	.6	4.8	2.3	53.3	38.7

CAHABA SILT LOAM.

The Cahaba silt loam consists of about 8 inches of brownish gray or brown mellow silt loam, underlain by a moderately friable reddish-brown silt loam to silty clay loam, which becomes heavier and is somewhat mottled with gray and yellow in the lower part of the profile.

This type is of rather limited extent. Typical areas occur about 5 miles northeast of Columbus on the Luxapallila terrace and near Bartons Ferry on the Tombigbee River terrace. A part of the type is subject to overflow during very high water. The surface is nearly flat, but usually slopes gently toward the streams. The drainage, on the whole, is good.

The soil is easily tilled and kept in good tilth, especially where vegetable matter is occasionally plowed under.

Cotton and corn are the main crops grown on this type, and good yields are secured with moderate fertilization. Cowpeas, peanuts, oats, and a number of vegetables can be successfully grown. The timbered areas support a growth of oak, willow, pine, and gum. A number of wild grasses afford good grazing.

Cahaba silt loam, high terrace phase.—The essential difference between the Cahaba silt loam as developed on the high terraces and that on the low terraces lies in the better drainage and more nearly red color of the subsoil of the former. Some erosion has taken place on areas of the phase, but as yet they have not been seriously damaged. Erosion may be checked easily by seeding to Johnson grass, Bermuda grass, or lespedeza. The agricultural value of the phase is generally higher than that of the typical soil, owing to better drainage.

CAHABA FINE SANDY LOAM.

The Cahaba fine sandy loam consists of a grayish-brown fine sandy loam, 6 to 10 inches deep, underlain by a reddish-brown, friable fine sandy loam, which quickly grades into fine sandy clay. A few areas show some variation in the texture. Occasionally the subsoil is decidedly red, in which case the type is very similar in character to the Orangeburg fine sandy loam. Quartz gravel occurs in small patches, especially near the junction of the first and second terraces. There was included with this type a phase having a sandy loam subsoil, which is much less retentive of moisture than the typical soil. A portion of the type on the first terraces is subject to overflow during very high water.

The Cahaba fine sandy loam is extensively developed in Lowndes County. It is valuable agricultural soil, although much of it is not farmed in a way to secure maximum yields. Considerable areas are in need of improvement, such as can be easily brought about, es-

pecially by practicing crop rotation and growing more leguminous crops, especially cowpeas, in the summer and vetch and bur clover in the winter.

The type is particularly adapted to oats, cotton, corn, peanuts, and to Irish potatoes, sweet potatoes, and a number of other vegetables. Strawberries, blackberries, and dewberries could be profitably grown for shipment. Cantaloupes and watermelons are successfully grown for home use. The soil is well drained, and crops mature early. This will prove to be one of the best cotton soils if the boll weevil ever should become troublesome locally.

A high state of productiveness can be brought about and maintained in land of this type by fall plowing and the incorporation of organic matter. Growing legumes as winter cover crops, as hay and seed crops, and as catch crops between the rows of cotton and corn is the most economical means of supplying humus under existing conditions. These crops, where deep rooted, also have a beneficial mechanical effect on the subsoil. At present the yield of corn varies from 15 to 25 bushels, and of cotton from one-third to one-half bale per acre. From 20 to 30 bushels of oats is the ordinary range for this crop. These yields could be doubled with better methods of cultivation.

Some of the more nearly level fields need ditching to provide proper drainage. Moderate applications of commercial fertilizers, especially mixtures of acid phosphate, cottonseed meal, and kainit, in the proportion of 1 part each of acid phosphate and kainit to 2 parts of the meal, have been found valuable for cotton, corn, and oats on this soil in many sections of Alabama and Mississippi. The quantity of fertilizer required will not be so great where the soil is liberally supplied with vegetable matter.

Cahaba fine sandy loam, high terrace phase.—On the higher terraces the Cahaba fine sandy loam is in the main better drained and more complete oxidation has taken place than in most areas of the type lying on the lower terraces. The soil is usually reddish brown and the subsoil dull red, quite like that of the Ruston fine sandy loam. In occasional patches the red is quite pronounced, the subsoil here resembling that of the Orangeburg fine sandy loam. There are small areas where the drainage is imperfectly established, owing to the flat or slightly depressed surface.

This high terrace phase is probably a little more productive than the average soil of the lower terrace. It is adapted to the same crops.

CAHABA SAND.

The Cahaba sand is a rather loose light-brown sand, which at a depth of about 2 feet becomes reddish in color, at 4 feet grading into sandy loam, which in turn rests upon clay.

The type occurs as scattered patches on the terraces of the Tombigbee River. It is mainly above overflow, though portions of it have recently been flooded by very high water. It is not considered a very valuable agricultural soil. Crops suffer in dry weather, though not as much as they do on most of the deep upland sandy soils of the coastal plain. Liberal addition of vegetable manure, especially by turning under cowpeas, would make the soil considerably more retentive of moisture. This land warms up early in spring and could be successfully used for early vegetables. Used for these crops it would need liberal fertilization with complete mixtures. Parts of it now used for cotton and corn give low yields.

A mechanical analysis of a sample of Cahaba sand gave the following results:

Mechanical analysis of Cahaba sand.

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.*
22021	Soil	0.0	7.5	37.0	40.1	6.1	6.3	2.5

KALMIA SILT LOAM.

The Kalmia silt loam consists of a grayish brown to drab silt loam 8 to 10 inches deep, underlain by a yellow silty clay with frequent mottlings of gray, especially in the lower portions of the poorer drained areas. This type is developed on the lower stream terraces, where the surface is so flat that the drainage is usually inadequate. Most of the type is forested with bay, beech, black gum, water oak, swamp maple, and redbud. Oaks, scattering pine, and some elm are seen in the better drained situations. There are many varieties of grasses which afford good pasturage. The type could be profitably used in the production of hay.

This soil could be very materially improved by ditching, and much of it put into condition for the production of oats, corn, cotton, sugar cane, sorghum, and cowpeas. Green manuring crops should be included in all rotations, as the soil is in need of vegetable matter. An application of 1 ton of burned lime per acre, following drainage, unquestionably would increase the productiveness of the type. Acid phosphate will probably be needed under boll-weevil conditions to hasten the maturity of cotton. Moderate applications of complete fertilizers would likely benefit most of the crops adapted to the type.

Kalmia silt loam, high terrace phase.—The greater proportion of the Kalmia silt loam occupies the high terraces. The larger areas are those in the vicinity of Hutchinson Store and to the east of Cherokee School. This phase has better drainage than the type as

developed on the lower terraces. There is less of the gray mottling in the subsoil. Portions of this phase, however, are so very flat that the surface drainage is inadequate, and in such areas the deep subsoil is usually mottled yellow and gray. In the best drained situations the subsoil is yellow without any mottling, under which condition there is little difference in the appearance of this soil and the Norfolk silt loam of the uplands. This phase has about the same agricultural value as that mapped on the lower terraces, though its better average drainage makes it somewhat more valuable as a whole.

Land of the Kalmia silt loam type of soil is valued at $7 to $14 an acre.

KALMIA FINE SANDY LOAM.

The Kalmia fine sandy loam to a depth of about 6 to 10 inches is a gray to yellowish-brown loamy fine sand to fine sandy loam, frequently containing water-rounded gravel. The subsoil is a yellowish fine sandy clay, usually mottled with shades of gray, brown, and yellow, the mottling being more intense in the poorer drained areas. Iron concretions are quite numerous in occasional small patches, such areas having a low agricultural value. Some areas of this soil are overflowed during very high water.

The type is sparingly developed on the lower terraces of McCrary and Luxapallila Creeks and the Tombigbee River. The typical development is seen in the area near Davis store, 3 miles northwest of Columbus.

Kalmia fine sandy loam, high terrace phase.—On the higher stream terraces the Kalmia fine sandy loam is much more extensively developed than on the lower terraces. There are large areas 6 miles north of Columbus and on the Pickensville road near Armstrongs and Claiborne Chapels where there is comparatively little difference between this phase and that occupying the lower terraces, though much of it is better drained than the lower terrace areas. The subsoil of the phase is a yellow fine sandy clay, slightly mottled in the lower part with gray. The topography is gently undulating, while that of the lower terrace is mainly flat. There is usually a gradual rise from the lower terrace to the higher terrace, although in many places there is an abrupt drop of 10 to 20 feet. None of this phase is subject to overflow. Occasional areas are flat or slightly depressed and these are poorly drained. There are some incipient drainage ways, usually covered with a growth of water-loving trees.

The Kalmia fine sandy loam in its natural condition produces a number of wild grasses, including lespedeza, which afford good pasturage. Under ordinary treatment the acreage yields are about as follows: Cotton one-fourth to one-half bale, corn 15 to 25 bushels, and cowpeas 1 ton to 1½ tons. Sorghum is a popular crop on this

soil both for sirup and forage. Peanuts do every well, and their cultivation should be extended, particularly as a field forage crop for hogs. Sugar cane could be successfully grown with fertilization. Both sweet and Irish potatoes give large yields. These crops could be produced on a commercial scale. Strawberries and a considerable number of vegetables do well.

The type is very generally in need of vegetable matter, such as can be supplied advantageously by turning under cowpeas, vetch, and rye. Fertilizers, usually of the ordinary grades, are used in light applications. About the same fertilizer treatment is advised as for the Norfolk fine sandy loam. The poorer drained areas should be improved by ditching.

Some areas of this type are quite thickly settled and well farmed. The value of this soil ranges from $10 to $25 an acre.

MYATT SILT LOAM.

The soil of the Myatt silt loam to an average depth of 6 to 7 inches consists of a gray to dark-gray loam, sometimes faintly mottled with brownish colors. The subsoil is a gray, plastic silty clay loam to silty clay, sometimes mottled with yellowish colors. The type frequently grades into the better drained brownish terrace soils, and in such cases its surface portion is sometimes brown. The subsoil of much of this type is so impervious to water that good drainage conditions would be difficult to establish, requiring close ditching.

This type is developed on the terraces of the Tombigbee and Buttahatchie Rivers and Luxapallila Creek. The surface is flat and the drainage inadequate. There are occasional slight depressions, from which the water escapes mainly by evaporation. Streams flow sluggishly across this soil, and along their courses there are usually strips of semiswamp land. The largest typical area is that in the vicinity of Military Chapel.

The type is mainly in forests, principally oak, pine, hickory, and gum. At present the cultivated areas are restricted to the higher portions, in which better drainage conditions exist. Considerable grazing is afforded, paspalum, lespedeza, and broom sedge growing luxuriantly over most of the areas.

The soil is cold natured and crops are slow in maturing. Cotton and corn can not be grown profitably under present conditions. With thorough ditching the soil can be brought into a state fairly satisfactory for the production of corn, oats, and a number of forage crops. For cotton an application of acid phosphate would probably be necessary to force proper maturity. After draining applications of burned lime at the rate of 1 ton per acre would benefit the soil considerably. The type is at present valued at $8 to $10 an acre.

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

Mechanical analyses of Myatt 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.*
422027	Soil	0.0	0.8	0.8	13.3	8.4	57.6	18.7
422028	Subsoil	.1	.5	1.1	14.3	6.4	55.5	21.7

MYATT FINE SANDY LOAM.

The Myatt fine sandy loam consists of about 8 inches of ashy-gray to grayish-brown fine sandy loam, frequently running high in content of silt, underlain by a mottled gray and yellow silt loam, generally sticky and pasty, owing to lack of drainage. Rusty-brown mottlings are also found in the subsoil of many areas. The dense structure of the subsoil does not favor rapid movement of moisture. Iron concretions are common throughout the soil section.

The type is developed in rather small patches on both the lower and higher stream terraces. The surface configuration is nearly flat, and the drainage of both the soil and subsoil is exceedingly poor. There are some areas in which an impervious grayish sandy clay is developed below a depth of about 20 inches, where drainage is unusually poor, as the water has to escape wholly by evaporation. Nevertheless, these areas seem to dry more quickly than other portions of the type in dry weather.

This type, like the other terrace soils, is of alluvial origin, having been deposited by streams flowing through this area when they were at higher levels than at present.

Most of the type is timbered with water oak, pin oak, post oak, beech, bay, dogwood, and redbud. A number of wild grasses and lespedeza afford fair pasturage.

Some of the better drained higher lying areas are cultivated. The yields depend largely upon drainage conditions. In very wet years it is difficult to work the soil, and poor crops are usually the result. Cotton is inclined to shed badly in dry seasons. This could probably be remedied by applications of kainit. When properly drained and managed fair to moderate yields of corn, oats, cotton, cowpeas, sugar cane, and sorghum should be secured.

DRAINAGE.

The greater proportion of the soils of the county are more or less in need of drainage. The excess of water in the soils is due to several

causes, one or more of which may be operative in any given case. The region is one of heavy rainfall, there are wide areas of flat topography, the subsoil of many types is impervious, and the channels of many of the streams are choked with fallen logs and other débris. The permanent improvement of more than one-half of the area can only be accomplished by a carefully devised general system of drainage, and so is beyond the control of the individual farmer.

Throughout the area the sentiment is strongly in favor of local legislation to aid in the reclamation of the extensive areas of fertile first-bottom and terrace soils.

Some of the damage at present done by overflows may be lessened by the removal of obstructions from the larger streams. The reclamation of some of the smaller bottoms by straightening the streams or digging ditches may be effected by cooperation between a few farmers. In the case of McCowers and Gilmer Creeks and Motly Slough thousands of acres of fertile bottom lands await improvement, and this work is of sufficient magnitude to require State aid. Small areas have been drained by private enterprise already, in cases where all that was needed was clearing away the underbrush, straightening the stream channels, and removing from them the logs and other débris that hinder their flow.

On the high stream terrace in a broad belt from Cedar Ridge School to Military Chapel the drainage in many places is deficient, even more so than in the first bottoms. The surface has many flat depressions and tortuous sloughs filled with stagnant water, which can not escape, save by evaporation. Several thousand acres could be drained by utilizing wide, open ditches with gently sloping banks into which other laterals, either open or tiled, might empty. This particular section of the area does not call for extensive outlays because each field and farm can be drained separately into some deeper stream, and cooperative drainage is not needed.

It is a common error among farmers to assume that if the surface drainage is adequate the subsoil is also well drained. There are many places where the land has a good brown soil and a poorly drained, mottled gray and yellow subsoil. Although land of this kind may have sufficient drainage in the soil, the subsoil is often too wet to give the best results with deep-rooted crops.

The solid-red of the Orangeburg and the yellowish-red of the Ruston subsoils are probably the result of good drainage. On the other hand, the mottled shades of gray, yellow, and brown seen so frequently in the subsoils of the Kalmia, Myatt, Bibb, and Oktibbeha series indicate soil conditions which could be greatly improved by drainage. Liming, although usually beneficial to the poorly drained soil, is only temporary in its effects, unless the land is drained. Crops on the poorly drained soils often grow well until the roots

reach into the soggy subsoil, when growth becomes retarded or stops altogether.

The construction of drains in many instances requires the assistance of competent engineers. The details of the drainage problems are too numerous for discussion in this report, but are fully treated in bulletins to be had from the United States Department of Agriculture.

SUMMARY.

Lowndes County is situated along the Alabama line in east-central Mississippi, slightly north of the central part. It comprises 510 square miles, or 326,400 acres.

The rural population of the county is increasing, but a much larger population could be supported upon lands now in a condition suitable for farming, while with adequate drainage the number could be many times increased.

Two railroads traverse the county, affording good transportation facilities over a large part of the area.

The summers are long, although the heat seldom exceeds 95° F., and the winters are short and mild, with occasional frost and rarely a flurry of snow.

Agriculture is slowly developing along better lines, with more attention to the selection of seed, to cultural methods, and to crop rotation.

The improvement of public roads is being carried on in various sections of the county. There is an abundance of good road surfacing material, such as gravel, sand, and clay.

The surface of the county varies from flat to hilly. Very little land is unsuited to agriculture on account of rough topography, and most of it is well adapted to the use of the most improved implements.

The sandy uplands east of the Tombigbee are mainly well drained, as are the prairie belt soils. The overflowed stream bottoms are in need of better drainage in many places. Much good land is found in the bottoms, in spite of overflows, which are not usually frequent in the growing season. The stream terraces or second bottoms include large areas of both well and poorly drained soils. The former are quite productive and the latter can readily be made so.

Including Meadow, 27 distinct soils were mapped. These are adapted to cotton, corn, oats, wheat, alfalfa, Johnson grass, Bermuda grass, lespedeza, cowpeas, soy beans, melilotus, bur clover, peanuts, sugar cane, sorghum, wild grasses (for grazing and hay), strawberries, bramble fruits, summer apples, melons, and to sweet and Irish potatoes, and a large number of other vegetables.

The Ocklocknee series occurs in the overflowed bottoms of streams and is characterized by the brownish color of the surface soils. When protected from overflow and properly drained they give heavy yields of corn, sugar cane, sorghum, Johnson grass, and Bermuda grass.

The Bibb silt loam also occurs in the overflowed bottoms. It is gray in color and much poorer drained than the Ocklocknee and less productive. It is best suited to lespedeza, the native grasses, and corn.

The black Trinity clay is a first-bottom type consisting of material washed from the calcareous prairie soils. It is a very productive soil, being well adapted to corn, Johnson grass, and Bermuda grass, and, where protected from overflow and given good underdrainage, to alfalfa.

The Catalpa silty clay loam is closely associated with the Trinity, but differs essentially from the latter in its gray soil. It is not quite so productive, but is well suited to alfalfa, corn, Johnson grass, and cotton.

On the second bottoms or stream terraces, which lie largely above overflow, three soil series occur—the Cahaba, with brownish soils and reddish subsoils; the Kalmia, with light-brown soils and yellow or mottled yellow and gray subsoils, and the poorly drained Myatt, with gray soils and gray, plastic subsoils. The Cahaba soils are well drained and well suited to the general farm crops; the Kalmia soils are not quite so well drained as the Cahaba and consequently not so productive, while members of the Myatt series are the poorest of the second-bottom soils, being in their present condition best suited to grass. With drainage and liming corn and oats should do very well on them.

On the uplands the Norfolk series, which is characterized by light-gray soils and yellow subsoils, is adapted to the general farm crops and a great variety of vegetables.

The Ruston soils, with gray to grayish-brown surface soils and yellowish-red to dull-red subsoils, are very well suited to the general farm crops and peaches.

The Orangeburg fine sandy loam is well suited to the general farm crops, especially cotton, corn, and oats, and also to peaches.

The Guin gravelly sandy loam has a rough topography, which makes most of it unfit for cultivation.

The Oktibbeha series, or "post-oak" lands of the prairie belt, comprise some very strong soils, especially suited to cotton, corn, Johnson grass, soy beans, and oats.

The Houston clay, or "black prairie" soil, is a highly productive, durable soil, well adapted to alfalfa, corn, oats, soy beans, and John-

son grass. It does not require fertilizers, as do most of the upland soils of the county.

The Houston chalk, or "lime-hill" land, is of low agricultural value, but can be improved by growing melilotus, lespedeza, and Johnson grass.

Commercial fertilizers are extensively used, especially on the sandy uplands. Mixtures of cottonseed meal, acid phosphate, and kainit give good results with cotton, corn, oats, sugar cane, and vegetables. Phosphatic fertilizers, such as acid phosphate, are valuable in hastening maturity on the heavy, poorly-drained Trinity clay, Myatt silt loam, Bibb silt loam, Kalmia silt loam, and Ocklocknee silt loam.

All the upland sandy soils and a number of the heavier types are badly in need of vegetable matter, such as can be cheaply supplied by growing the legumes in rotation with the general farm crops. The added organic matter makes the land more retentive of moisture, gives the heavier soils better aeration, and generally lessens the quantity of nitrogenous fertilizer required. Applications of lime would benefit a great many of the heavier soils, probably all of them except the Houston and Trinity clays.

With extensive areas of land admirably suited to the production of a large number of winter and summer forage crops, stock raising is one of the promising industries. Hogs, cattle, and mules should be raised extensively in conjunction with general farming, including the cultivation of large areas to cowpeas, alfalfa, melilotus, Johnson grass, Bermuda grass, lespedeza, bur clover, soy beans, peanuts, and sorghum.

NRCS 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 its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a 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, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.