

U. S. DEPARTMENT OF AGRICULTURE  
BUREAU OF SOILS

IN COOPERATION WITH THE GEORGIA STATE COLLEGE OF AGRICULTURE

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SOIL SURVEY OF BIBB COUNTY  
GEORGIA

BY

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[Advance Sheets—Field Operations of the Bureau of Soils, 1922]



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PUBLIC RESOLUTION—No. 9

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

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

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

Approved March 14, 1904.

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

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### FIGURE

FIG. 32.—Sketch map showing location of the Bibb County area, Georgia. Page  
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### MAP

Soil map, Bibb County sheet, Georgia



# SOIL SURVEY OF BIBB COUNTY, GEORGIA

By S. W. PHILLIPS, in Charge, and A. H. MEYER, of the Georgia State College of Agriculture, and MARK BALDWIN and J. W. MOON, of the U. S. Department of Agriculture

## DESCRIPTION OF THE AREA

Bibb County occupies approximately the geographical center of Georgia. It is irregularly diamond shaped, with the long axis extending east and west 24 miles, and is about 20 miles across north and south. The Ocmulgee River forms part of the northeastern and southeastern boundary, and Echeconnee Creek marks the southern and southwestern boundary. The other boundaries follow survey lines. The area comprises 250 square miles, or 160,000 acres.

The fall line, or line of demarcation between the Piedmont Plateau and the Coastal Plain, crosses the county in a general southwesterly direction from near the point where Dry Bone Creek enters it from Jones County in the northeast, to the vicinity of the crossing of Echeconnee Creek by the road to Knoxville. The Piedmont Plateau, a plain underlain by ancient crystalline rocks, lies north of this line; the Coastal Plain, a region underlain by unconsolidated sands and clays of late geological age, lies south of it.

The county is characterized by rolling uplands, locally hilly, with narrow valleys in the Piedmont and relatively wide valleys in the Coastal Plain. The section about Lorane comprises the smoothest and least eroded portion of the Piedmont Plateau included in the county. South and east of this section, between the larger creeks and along the Ocmulgee River, the country is sharply dissected, the valley slopes being steep. The watershed ridges are very narrow, and only locally have any considerable areas of smooth land.

The sand-hill portion of the county, consisting of the inner border of the Coastal Plain lying immediately south of the Piedmont-Coastal Plain boundary, comprises a series of rolling divides between the large creeks, the latter having rather deep and sharply incised valleys. The slopes are generally less sharp and the interstream divides smoother and broader than those of the northern part of the county. Along the southeastern border of the county occur a series of rough, steep hills and knobs, including Brown Mountain, rising more than 100 feet above the valleys, that offer a wide contrast to the smoother ridges of the sand hills. South of the sand-hill belt the topography is smoother, becoming rolling or gently rolling, and in the vicinity of



FIG. 32.—Sketch map showing location of the Bibb County area, Georgia

Walden and Avondale are large areas of undulating or gently rolling country marked by a number of depressions or sinks.

The alluvial belt along the Ocmulgee River is broad. South of Macon the wide Tobesofkee Creek "swamp" merges with the river "swamp" to form a low, flat bottom about 4 miles wide. Terraces are developed along the river, particularly where the larger tributaries flow into the main stream bottoms, such areas of terrace or second bottom being developed near the mouths of Tobesofkee, Echeconnee, Walnut, and Swift Creeks.

The elevation in Macon is 334 feet above sea level at the Union Depot, and at Walden it is 390 feet; the higher ridges in the southeastern and western parts of Bibb County attain elevations of 100 feet or more above Macon.

All the drainage waters of the county are carried into the Ocmulgee River through a series of tributary streams. The uplands, with the exception of some depressed areas in the southern part, are thoroughly drained by a treelike system of branches which ramify all parts. The bottom lands along the lower part of Tobesofkee Creek and large parts of the Ocmulgee River bottoms are subject to frequent overflow and do not drain off completely after overflow periods. The streams are still actively cutting back their heads and are swift flowing in their descent from the Piedmont Plateau to the Coastal Plain, but in the broad bottoms they are more sluggish.

The first settlement in what is now Bibb County was an Indian trading post, Fort Hawkins (now East Macon), established in 1806. Sixteen years later (1822) Bibb County was organized, being set off from Houston County. A part of Twiggs County was added in 1833 and a part of Jones County in 1834. In 1823 some of the early settlers crossed the Ocmulgee River and located on the present site of Macon. The early settlers who were attracted to this locality by offers of land by lottery came from other parts of Georgia, from the Carolinas, and Virginia.

In 1920 the county had a population of 71,304, which was an increase of over 27 per cent since 1910, and of which 25.7 per cent was classed as rural. The population is most dense in the vicinity of Macon, near the villages of Lorane and Lizella in the western and northwestern parts, and near Rutland, Walden, and Skipperton in the southern part. The average density of the rural population is 66.1 persons per square mile. The rougher, eroded sections through the northern and west-central parts and the sand-hills section are more sparsely settled.

Macon, the county seat and only city in the county, has a population of 52,995, according to the 1920 census. It is an important manufacturing, railroad, and agricultural trading point for the central part of Georgia. Its important industries include large railroad shops, lumber and planing mills, brickyards, cotton mills, oil mills, and machinery, agricultural implement and fertilizer plants. Wesleyan College, Mercer University, and St. Stanislaus College are located here. There are no other incorporated towns in the county.

Excellent transportation facilities are available over most of the county and no part of it is more than 5 miles from a railroad. The main line of the Central of Georgia Railway, from Atlanta to Savannah, crosses the northern part of the county; a branch of the

same road runs from Macon through the northeastern part of the county, and another branch runs from Macon through the southern part and serves Rutland and Walden. The Southern Railway, from Cincinnati and Atlanta to Brunswick, enters along the Ocmulgee River in the northern part, extends south from Macon, and crosses the river in the southeast corner into Twiggs County. The Georgia Southern & Florida Railway, from Macon to Jacksonville crosses the southern part of the county through Sofkee and Avondale. The Macon, Dublin & Savannah Railroad and the Georgia Railroad serve the eastern part, and the Macon & Birmingham Railway serves the southwestern part of the county.

Bibb County has an excellent county road system. Most of the main roads radiating from Macon are surfaced with concrete at least part of the distance to the county line, and all of the main public roads are topped with a sandy clay cover and maintained in good condition throughout the year. The Dixie Highway crosses the county, and tourist travel through the winter months is very heavy.

Telephone and rural mail service are available throughout most of the county. The county school system consists mainly of consolidated schools at convenient points, to which the pupils are transported by school busses, giving them the advantages of up-to-date graded schools and high schools.

Macon is the most important market for the principal farm products and truck crops of the county, and northern cities offer good markets for peaches and melons.

#### CLIMATE

The climate of Bibb County is characterized by short, mild winters and long, hot summers. The average growing season is 229 days, the average date of the last killing frost in spring being March 23 and that of the first in the fall November 7. Frosts have been recorded as late in the spring as April 18 and as early in the fall as October 11.

The mean annual temperature is 64.1° F. The winter mean is 47.5° F., while the mean for the summer is 80° F. The highest temperature recorded by the Weather Bureau station at Macon was 104°F., occurring in July, while a minimum of -4° F. was reached in February.

The rainfall is well distributed throughout the year, being heaviest in March and lightest in October. It is most plentiful during the summer, when crops are growing, and lightest during the fall, when crops are being harvested. The mean annual rainfall compiled from a 52-year record, is 44.88 inches; that for the driest year on record (1904) being 31.69 inches and for the wettest year (1912) 61.86 inches.

Snow is rare and remains on the ground only a short time. Cold spells during the winter are of short duration and are followed by warm weather and rain. The temperature seldom falls below freezing, but the changeable nature of the average winter season is its most disagreeable feature. Cabbage, turnips, collards, and onions can be grown throughout the winter.

The grazing season averages about nine months. Unseasonable frosts occasionally do considerable damage to the peach blossoms which have opened early because of a warm winter, but no total failure from this cause has been recorded within the last 16 years.

The following table gives the normal monthly, seasonal, and annual temperature and precipitation, as recorded at the Weather Bureau station at Macon, and is representative of climatic conditions throughout the county:

*Normal monthly, seasonal, and annual temperature and precipitation at Macon*

[Elevation, 370 feet]

Month	Temperature			Precipitation		
	Mean	Absolute maximum	Absolute minimum	Mean	Total amount for the driest year (1904)	Total amount for the wettest year (1912)
	° F.	° F.	° F.	Inches	Inches	Inches
December.....	46.7	77	11	3.99	3.32	3.91
January.....	47.3	78	10	3.66	2.85	4.42
February.....	48.5	82	—4	4.44	4.07	4.46
Winter.....	47.5	82	—4	12.09	10.24	12.79
March.....	56.6	91	17	5.02	1.69	9.40
April.....	63.9	92	31	3.73	.99	8.14
May.....	72.3	99	41	2.89	1.83	3.60
Spring.....	64.3	99	17	11.64	4.51	21.14
June.....	78.8	103	44	3.90	1.88	8.62
July.....	81.1	104	59	4.85	3.28	6.09
August.....	80.0	100	58	4.34	7.99	2.75
Summer.....	80.0	104	44	13.09	13.15	17.46
September.....	75.3	102	44	3.02	1.34	5.22
October.....	64.8	95	28	2.27	.19	1.50
November.....	54.2	84	19	2.77	2.26	3.75
Fall.....	64.8	102	19	8.06	3.79	10.47
Year.....	64.1	104	—4	44.88	31.69	61.86

#### AGRICULTURE

Before the advent of the white settlers in this section of Georgia the Indians had cleared some fields and were producing such crops as corn, tobacco, peas, beans, and squash. Owing to the long distance from market, the early settlers were compelled to be practically self-sustaining and therefore engaged in the production of food crops, cattle, and hogs for their own needs. The uplands were cleared and used for cultivated crops, the bottoms or "swamps," which were largely in hardwood forest, being utilized for pasture and range. Following the perfection of the cotton gin, cotton growing received a strong impetus and after the Civil War attained a leading place in the agriculture of the county. Since about 1890 the production of fruit, particularly peaches, has grown steadily in importance. With the advent of the boll weevil and the resultant disastrous effect upon the cotton crop, some attention has been given to the growing of sweet potatoes, peanuts, and small grains, but cotton and corn remain the principal crops.

Under the present boll-weevil conditions, cotton growing is in a demoralized condition. Methods to control the weevil have not been generally adopted, although where given a fair trial the application of calcium arsenate dust has given profitable returns. On one farm where 3 acres of cotton were dusted seven times during the season of 1922, and frequent shallow cultivations were given, 1,517 pounds of lint cotton were picked, as compared with 507 pounds of lint cotton picked upon an adjoining 3-acre field of similar soil which had been fertilized and cultivated in the same way but had not been dusted.

At the present time cotton is the principal cash crop, and a farmer's yearly returns and financial status are measured mainly by the number of bales of cotton produced. According to the census, cotton was planted in 1919 on 24,927 acres and yielded 6,474 bales, or 0.27 bale per acre, as compared with 9,418 bales produced on 24,535 acres, an average of 0.38 bale per acre, in 1909. Cotton occupied 38.4 per cent of the improved land in 1919. However, boll-weevil damage has been very serious during the last three years and the production in 1922 is reported to be below that of 1919. The large cotton mills at Macon use most of the cotton produced in Bibb County and the adjoining counties.

Corn ranks next to cotton in importance. In 1919 it was grown on 18,479 acres, or 28.4 per cent of the improved farm land; this was an increase of 3,134 acres over that reported for 1909, but 3,432 acres less than was grown in 1900. The average yield was 11.3 bushels per acre, which is about the average yield for the last 30 years. Much higher yields are produced by the better farmers, and the county is capable of much larger average production, but the corn is usually grown on the poorest land and receives smaller fertilizer applications and less attention than cotton. The corn produced does not suffice for the local requirements for feed, and some is shipped in annually. Dairymen cut considerable quantities of corn and sorghum for silage.

The growing of peaches has become of considerable importance in the southern and southwestern parts of the county, near Avondale, Walden, and Lizella, and to a less extent near Lorane in the northwestern part. The Greenville, Orangeburg, and Norfolk soils in the lower part of the county, and the Davidson and Cecil soils in the northwestern part appear to be favored for planting peaches. The 1920 census reported 207,978 peach trees of bearing age in Bibb County. The most common varieties are Carman, Uneeda, Belle (Belle of Georgia), Hiley (Hiley Belle), Elberta, Mayflower, Early Wheeler (Red Bird), and Early Rose. The equable climate of this region seems particularly well suited to fruit, and there has not been a total failure of peaches in the last 16 years. The trees are set out in squares from 16 feet to about 18 feet apart, averaging about 130 trees per acre. Fertilizer applications, as a rule, are heavy, varying from 3 to 5 pounds per tree of a mixture rather high in potash for the southern part of the county and somewhat lower in this element in the northern part of the county where the soils are less in need of it. Extra heavy applications of high-grade fertilizers are essential to orchards located on the light Norfolk sand or Norfolk sandy loam, deep phase. The

fertilizer is preferably scattered over the interrow space rather than close around the trees; this encourages roots to spread, thus making the trees more hardy and less susceptible to drought. Fertilizers are applied the latter part of January or in February, and where such crops as cowpeas, peanuts, rye, and velvet beans are planted an additional application is made in May. It is said that this practice tends to keep the trees green, mature the buds, and produce more fruit. The peanuts are grazed off by hogs, which apparently do not damage the trees. The peas and beans are harvested, the vines being turned under for improvement of the soil.

The orchards are pruned in the fall, and paradichlorobenzene is applied in a ring around each tree to kill the borers. The trees are sprayed during the winter with a lime-sulphur compound as a protection against the scale, and a series of lime-sulphur-lead-arsenate sprays or dustings are applied, the first when the petals fall, the second in about 10 days, and a third about two weeks later. A fourth spraying of lime-sulphur solution is given about a month before the fruit ripens as protection against the rot. Brown rot is not very injurious in orchards located in deep sandy soils, but on the sandy loams, particularly in flats or slight depressions where the drainage is imperfect, injury sometimes results from this disease.

The picking season runs from about the last of May to the middle of July. The fruit is usually packed at the orchard packing house or at packing houses located on the nearest railroad. Yields range from three-fourths crate to four or five crates per tree and average between one and two crates. The fruit is generally handled in car-load lots through the fruit exchanges or f. o. b. the nearest railroad point, each refrigerator car having a capacity of 475 to 500 crates.

Practically all the fruit growers have side lines, such as hogs, poultry, or truck crops. Pecans have been set out in many peach orchards at intervals of about 60 to 80 feet, and as the peaches pass their maximum production they will be removed and the pecans allowed to take up all of the land. In addition, pecans have been set out recently in considerable numbers, the land being intercropped for several years until the trees come into bearing. The Stuart, Schley, and Moneymaker are among the most popular varieties. Strawberries, figs, and pears are grown to a small extent.

Trucking has become of considerable importance. The 1920 census reports the value of vegetables produced in 1919 as \$249,868. The growing of truck crops is especially important on the sandy lands in the vicinity of Macon. Collards, turnips, onions, cabbage, and lettuce can be grown practically throughout the winter. Several overhead irrigation systems have been installed and found profitable. Watermelons and cantaloupes are grown to a considerable extent, both for the local market and for shipping.

Applications of 1,000 pounds of high-grade fertilizer analyzing 8-3-3<sup>1</sup> or 8-3-4 are commonly made for truck crops. The surplus of tomatoes, peas, lima beans, green beans, and pimento peppers can be disposed of at the canning factory recently started at Franklinton, in the eastern part of the county.

Sugar cane for sirup for home needs is raised by most farmers and enough sirup is produced locally to supply the demand in Macon.

<sup>1</sup> Percentage composition of phosphoric acid, ammonia, and potash.

The sale of sugar cane at stores for chewing is also a source of income to a number of farmers. Fertilizer consisting of cottonseed meal, acid phosphate, and potash is applied at the rate of 400 pounds per acre. The use of barnyard manure is avoided as it produces a salty flavored sirup. Application of potash in the form of the sulphate is said to produce a higher percentage of sugar. The lighter sandy soils produce a light-colored sirup which is much preferred and brings a better price on the market. The seed cane, kept from the previous season, is planted in rows about 5 feet apart. The stubble from the previous year will produce about one-fourth to one-half of a normal crop.

Several crops each season are produced on the same piece of land by most truckers, who keep their fields in a high state of cultivation by fertilizing liberally and using all the barnyard manure available.

Sweet potatoes are grown on every farm and are being grown commercially to some extent. They were planted on 642 acres in 1919. Several curing houses have been built for storing and curing, and sweet potatoes properly handled by this system are in better condition and bring a higher price, particularly in the spring, than those stored in the usual potato pits. The principal varieties are the Nancy Hall and Porto Rico. Yields vary from 75 to over 200 bushels per acre, the highest reported in 1922 being 262 bushels per acre produced on Greenville sandy loam.

Dairying has grown greatly in importance in the last 20 years. The value of the dairy products in 1919, as reported by the 1920 census, was \$320,004, which is almost twice the value reported for 1909 and six times that reported for 1899. The dairy cows are purebred or grades of the Holstein and Jersey breeds. The products are sold either in bulk or by house deliveries in small quantities. The dairymen raise oats, rye, and vetch for winter pasture and put up a considerable quantity of silage for winter feeding. Cottonseed products and commercial feeds are also used by most dairymen.

Oats were raised on 383 acres in 1919 with an average production of about 20 bushels per acre. Much of the oat crop is fed in the straw. Oats are sometimes sown between the cotton rows in the fall. Fulghum and Rustproof are the common varieties. Rye is grown in patches for winter grazing for milk cows. Some farmers cut the rye, obtaining two or three cuttings of palatable hay, which is sold to dairymen. Wheat was grown on 488 acres in 1919 and yielded 12 bushels per acre.

Cowpeas are grown both for hay and for hog and cattle forage in the fall. When grown for hay they are seeded broadcast and the stubble is plowed under. The most common varieties are Iron and Brabham. Velvet beans are commonly planted in the corn about the time of the second cultivation. They produce a heavy growth of vine and leaves and yield large quantities of fall forage for cattle. Usually only enough beans are picked to supply seed, although some farmers harvest their entire crop and have the beans ground into feed, or feed them after soaking to soften the hulls. Cowpeas and velvet beans are excellent soil improvers, as they store up nitrogen and furnish an abundance of material to plow under, which tends to improve the tilth of the soil, enlarge its water-holding capacity, and increase the humus content.

In addition to cowpea hay, Bermuda grass, Johnson grass, and crab grass, besides some coarse wild grasses on the bottom lands are cut. The pastures consist of Bermuda grass, dallis grass, lespedeza, and considerable tickle grass, crowfoot, and other grasses that have some value for pasture while green and before becoming too woody.

Alfalfa has been grown successfully by several farmers in the county. It is well suited to the Davidson soils of the northern part of the county, which contain some lime, and has also been grown successfully on the Norfolk, Kalmia, and Bradley soils. One successful grower, after preparing the land carefully, applied 2 tons of finely crushed limestone and several loads of barnyard manure per acre, seeded at the rate of about 25 to 30 pounds per acre with inoculated seed, and put on about 100 pounds of nitrate of soda in early spring. The best time to seed appears to be about November 1.

All farmers raise enough hogs for their own needs, with occasionally a surplus for sale, which is usually sold in the form of fresh pork. The principal breeds are Duroc-Jersey, Poland-China, and Hampshire. Most of the white farmers graze a few head of cattle, but the negro tenant rarely has more than one milk cow. Poultry and eggs find a ready market in Macon, and the local supply does not meet the demand in the late fall and winter months. A few chickens are raised on most farms. Poultry products to the value of about \$35,000 are sold on the local markets. The census reports the value of poultry and eggs produced in 1919 as \$79,334.

As it is important to plant the cotton early in order to obtain maturity of the crop, the sandy soils are recognized as best suited for cotton, but under the present system of farming both cotton and corn are grown on all the upland soils in the county, the bottom lands usually being reserved for corn and hay.

The Davidson and Cecil soils are recognized as the strongest and most productive soils in the Piedmont section, and the Norfolk sandy loam, Greenville, and Orangeburg soils in the Coastal Plain are usually considered the best of the sandy-land soils. The red soils, such as the Orangeburg, Greenville, and Davidson, are said to give peaches a higher color, which tends to bring better prices. The farmers consider the Piedmont soils somewhat better for grain and recognize the fact that these soils generally do not require as much potash for crop production as do the sandy lands.

The farm machinery in general use consists of light 1-horse implements, but in some parts of the Piedmont section where the soils are heavier, and on the better farms, 2-horse implements are used. A number of tractors are now used for cultivating between the peach trees and for plowing on the level or gently rolling land.

For cotton the land is plowed in the fall or winter and harrowed in the spring with a cutaway or spike-tooth harrow and smoothing harrow. The rows are laid off with a middle buster and the fertilizer distributed in the furrow before planting. The usual application for cotton is about 250 pounds of 8-3-3 fertilizer, although the better farmers fertilize much heavier, applying 400 to 500 pounds per acre. The higher grades of fertilizer have proved more profitable than the cheaper grades, as they hasten the maturity of the crop. Some farmers apply 100 to 150 pounds of fertilizer at the last cultivation. The principal varieties of cotton are Cleveland and Toole.

The crop is usually planted about the last of April in rows  $3\frac{1}{2}$  to 4 feet apart, and thinned out with hand hoes, the plants being spaced 10 to 16 inches apart. It is cultivated with light 1-horse implements four to seven times during the season, frequent cultivation being essential under present conditions to conserve moisture and hasten the maturity of the crop. The average cotton farmer plants 10 to 15 acres of cotton to the plow (25 to 30 acres of cultivated land), the remainder being put into corn, potatoes, and peas. Where calcium arsenate and other poisons have been carefully tried out the yields have been increased from 50 to 200 per cent.

Corn land is plowed during the fall or winter, but in general is not so carefully prepared as land for cotton. The corn is planted in rows  $4\frac{1}{2}$  to 6 feet apart, the hills in the rows being 12 to 18 inches apart, but in the more level parts of the county some of the corn is planted in squares and cultivated both ways. Corn planting extends from the middle of March to the latter part of June, depending upon the season, and cultivation continues to the last of July. The leaves are pulled in late August and September and used for fodder, but when cowpeas or velvet beans are planted at the last cultivation the crop is allowed to go to maturity, the ears are gathered in October or November, and hogs and cattle are turned into the field. Some farmers plant at intervals to insure against loss from summer drought. Corn is usually fertilized with 200 to 300 pounds per acre of an 8-3-3 or 9-3-3 grade. Some farmers are substituting corn to some extent for cotton.

Oats and rye are either broadcast and plowed under or the seed bed is prepared and the seed planted with a drill. The latter is the better practice, as it leaves the field in a less clodded and smoother condition, lessens the evaporation of soil moisture, and insures a more uniform stand.

Most farmers plant cotton for several successive years, then plant corn for a year or two before changing back to cotton. Some farmers, however, practice a rotation as follows: A cotton crop is followed in the fall by rye, which is grazed off during the dry spells in winter; corn is planted the following spring and oats are seeded in the fall and grazed or cut for hay; the third year a crop of cowpeas is cut in the fall, and the land is again planted to cotton the next year. This is a good rotation, particularly when cowpeas or velvet beans are planted in the corn and pastured, as the land is protected from washing during the winter and the humus content of the soil is increased. The severe erosion that occurs on sloping land is in part caused by the depletion of the organic matter in the soil owing to the old system of constant cropping to cotton and corn, with no cover crop during the winter.

Over the greater part of the county the farmhouses are small and conveniences such as running water and lights are rare. The barns and outbuildings are small, except on some of the larger dairy farms, which have large barns and silos. Mules comprise most of the work stock. The value of all livestock, consisting mainly of work stock, milk cows, and hogs, was reported by the 1920 census as \$805,005.

The use of commercial fertilizer has become general among Bibb County farmers in the last 20 years. It is used on all types of soil

except those of the first bottoms, which consist of overflowed lands. In 1919 the expenditure for fertilizer, as reported in the census, was \$168,297, as compared with \$93,218 in 1909 and \$37,487 in 1889. The fertilizer is usually ready mixed, and the greater part is applied to the cotton crop.

Practically all of the hired farm laborers are negroes. The small farmers usually perform all of their work with the assistance of their families. During the last few years there has been a considerable exodus of negroes to the North and West, and a number of farms, particularly in the more hilly sections, are now untenanted. During the peach-picking season there is usually sufficient labor, consisting mainly of negro women and children from Macon and the various communities, to gather the crop. The usual price for picking peaches is 2 cents a basket or about \$1 a day. Grading and packing are generally done by white help at wages ranging from \$2 to \$2.50 a day. For general farm labor wages vary from about 60 cents to \$1 a day, with the use of a tenant house. According to the census, 38.8 per cent of all farms reported an expenditure for labor amounting to \$186,578, or an average of \$329.64, of farms reporting.

The majority of the farms in Bibb County contain from 20 to 100 acres, but some land holdings are much larger. As reported by the 1920 census, the average size of the farms was 73.2 acres, including 44.6 acres of improved land; each tenancy being enumerated as a farm.

The 1920 census reports that 62.7 per cent of the farms of Bibb County are operated by tenants, and 35.8 per cent by the owners. A majority of the tenant farms are operated by negroes under the supervision of the white owners who live in town and supervise the farm work. The land is rented on shares, for cash, or for a stipulated quantity of cotton. The latter is the most common, and payment consists of 1 to 2 bales of cotton for a farm of 25 to 30 acres. In the share-rent system the owner retains the privilege of deciding what to plant and furnishes the land, machinery, and stock, and one-half the fertilizer and seed, and the crop is equally divided between the owner and tenant.

At the present time (1922) the selling price of land in Bibb County is considerably less than during the period following the late war. The 1920 census reported the average assessed value of land in the county as \$49.37 an acre. The present range in selling price is from \$10 to \$15 an acre for the thin and less desirably located farm land, up to about \$100 for the more highly improved farms, and \$200 to \$300 for land set out in peaches, while some land brings a much higher price. Good farms sell at the present time for \$30 to \$45 an acre.

#### SOILS

The soils of Bibb County are prevailingly light in color, the surface soils ranging from light gray or almost white to red, this light color expressing a prevailingly low content of organic matter. The conditions have not favored the accumulation of vegetable matter, as there were no grass areas, the county being forested until reclaimed for agriculture. In the wooded areas there is a noticeable amount of rather coarse vegetable matter in the first inch or two of

soil, but the plant remains have not become incorporated in the soil, as in areas with a grass cover.

There has been and still is much leaching, owing to heavy rainfall and relatively high temperature, and to the fact that clean cultivation is generally practiced. Not only has carbonate of lime not accumulated in the soils, but the original carbonates in the parent geological formations from which many of the soils have been derived have been entirely removed from the soil profile. Very few of the soils are decidedly acid in character, though practically all of them respond to liberal applications of lime. This is particularly true of the Grady clay loam, Cecil clay loam, and Congaree silty clay loam.

There are two main classes of soils in Bibb County—the light, sandy soils of the southern and central parts of the county, the Coastal Plain region, and the heavier soils of the northern and north-western parts, the Piedmont region. Grouped on the basis of general features of the soil profiles, the soils of the county fall into two main groups. In one of these, which includes by far the greater number of the soils of the county, the soils have attained a stage in their development that may be considered the normal or mature stage of development of the general region in which they lie. In this stage the soils are characterized by a surface layer or horizon of relatively light texture, an underlying layer of relatively heavy texture, and a third horizon which may vary considerably in texture; in this region it is usually lighter in texture than the second horizon, but often heavier than the first. The textures of these layers vary greatly in the soils of the region, the surface layers ranging from clay loams to sands and the second horizon from clays to very light sandy loams, but in all cases the succession in any given soil consists of a lighter-textured layer overlying a heavier layer, and this in turn usually overlying a lighter-textured layer.

In thickness these layers vary widely also, the surface layer ranging from a few inches in the clay loams to a maximum of around 2 feet in the most sandy soils.

Mechanical analyses of samples collected from this county have not been made, but the textures of the several types mapped were determined by field methods while the work was in progress, and these determinations were confirmed by inspection of samples sent to the laboratories in Washington. Mechanical analyses have been made of samples of some of the same types collected from near-by areas, and these are introduced into the following table to illustrate the textural differences in the horizons of these soils:

*Mechanical analyses of Appling sandy loam, Cecil clay loam, and Davidson clay loam*

APPLING SANDY LOAM

Number	Depth	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
		<i>Per cent</i>						
236515	0 to 2 inches.....	14.8	26.0	8.4	23.4	8.4	12.3	6.9
236516	2 to 8 inches.....	21.2	21.4	6.7	18.8	8.2	15.4	8.5
236517	8 to 18 inches.....	6.8	7.6	2.2	6.2	3.0	13.4	61.0
236518	18 to 40 inches.....	5.0	7.4	2.3	7.0	3.6	14.8	60.0
236519	40 to 72 inches.....	12.1	12.2	3.6	13.0	6.3	18.5	34.3
236520	72 inches +.....	9.2	16.4	4.7	18.0	10.4	27.4	13.9

*Mechanical analyses of Appling sandy loam, Cecil clay loam, and Davidson clay loam—Continued*

## CECIL CLAY LOAM

Number	Depth	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
		<i>Per cent</i>						
236504	0 to 1 inch.....	3.0	10.1	4.6	21.6	8.4	25.9	26.3
236505	1 to 6 inches.....	2.8	7.0	4.0	20.6	9.6	26.6	29.5
236506	6 to 40 inches.....	2.4	5.4	2.8	12.6	8.0	24.7	44.1
236507	40 to 60 inches.....	1.2	7.6	8.4	22.6	4.6	15.2	40.6
236508	60 to 84 inches.....	.8	4.4	4.8	24.4	15.1	28.3	22.1
236509	84 inches +.....	5.0	18.6	11.0	34.6	8.0	14.1	8.7

## DAVIDSON CLAY LOAM

30837	0 to 9 inches.....	5.0	5.4	4.2	23.6	12.8	25.0	24.1
30838	9 to 28 inches.....	5.8	3.6	2.3	13.8	8.4	17.5	48.6
30839	28 to 50 inches.....	.8	2.6	2.0	12.8	8.8	22.0	51.0
30840	50 to 60 inches.....	5.6	4.4	1.2	6.4	8.0	29.4	45.1
30841	60 to 80 inches.....	.2	2.1	2.8	14.8	14.4	32.7	33.0

The soils of this well-developed group include all the types of the Cecil, Davidson, Appling, Norfolk, Orangeburg, Ruston, Greenville, Kalmia, and Wickham series.

The second main group includes soils in which the three texture horizons are not present. These soils, consisting of the Wilkes, Grady, Bradley, Hoffman, Augusta, and Congaree soils, are characterized by the absence of the intermediate, relatively heavy horizon and in some cases the absence of any horizon development at all.

The Bradley soils present characteristics different from any other soils in the county. They have deep sandy layers of coastal plain material, which is loose and single grained, and heavy red clay in the B horizon is similar to the red clay subsoil of the Cecil series. It is evident that the heavy clay subsoil is derived from the underlying rocks and that very little material has been taken from the surface and deposited in the subsoil. In the Hoffman series there is also no profile development, as the surface layer of light sandy material overlies the parent material of the Coastal Plain region. This parent material has not weathered to any uniform color, texture, or structure. It is the most varicolored material underlying any of the soils in the county. In color and structure the material of the Augusta soils resembles that of the Hoffman soils. The Augusta soils are developed on the terraces and are more uniform in the depths of the various soil sections.

In the soils of the Wilkes series the surface horizon has a relatively light texture, but the second horizon is heavy, tough, and plastic, and extends downward to the parent schists or gneisses from which the material was derived. This is essentially the same profile as that of the Grady soils except that the second layer in the Grady is not so heavy and tough, as a rule, as the same layer of the Wilkes soils. In the Congaree soils the relationship of heavy to light-textured layers is unsystematic. The surface layer may be relatively heavy or light, and the same may be true of any other part of the profile.

The soils of Group 1 may be divided into two subgroups on the basis of the general features of the color profile or the successive

color layers or horizons in the soil section. The first subgroup, including the soils of the Cecil, Davidson, Appling, Orangeburg, and Greenville series, is marked by a color profile, in the uncultivated soils, about as follows:

1. A layer of leaf mold mixed with the clay or sand of the soil. If it be mainly sand, the grains will be gray or brown as a rule, but if it be silt or clay, it will usually be rather well mixed with the organic matter of the leaf mold and will be dark in color. This layer ranges in thickness from a mere film to a maximum of about 3 inches. It is usually thickest in the sandy soils.

2. A pale-yellow or grayish-yellow layer, showing very little evidence of the presence of organic matter. In the heavy soils of the Cecil and Davidson series this layer is not recognized. Even when present it is often modified by the reddish color of the next horizon as though it had formerly had a red color. In the sandy soils it will range up to 2 feet in thickness, or in extreme cases a little more. These two layers constitute part of the relatively light-textured surface soil.

3. A red layer ranging in color from deep, almost blood red, through crimson, to yellowish red. The soils of the Davidson series have the darkest-red color of this group and those of the Appling series usually the most nearly yellowish red. This horizon is usually the same as the heavy intermediate horizon of the texture profile.

4. A reddish, grayish, yellowish, or mottled horizon corresponding to the third horizon of the texture profile. Where reddish, the color is less strong than that of the third layer. Since this layer is part of the parent material, its color varies not merely from type to type, but somewhat from place to place in the same type.

The second subgroup of soils, differentiated on the basis of the color of the several layers, includes the members of the Norfolk and Ruston series. These are characterized by a series of color layers in which the two upper layers are identical with the corresponding layers in the first subgroup, but the third layer, in its upper and by far larger part, is yellow in color. In its lower part, however, there is usually a thin red layer, sometimes so thin that it is difficult to detect. This is true of the Norfolk series; in the case of the Ruston series the reddish color, though not strongly red, is present throughout the whole horizon. The fourth horizon or color layer in these soils varies, like the corresponding layer in the first subgroup.

The soils of the first or normally developed group may also be subdivided into two subgroups, according to the character of the intermediate, relatively heavy horizon. In one of these, which will include the soils of the Cecil, Davidson, and Appling series, this horizon is a heavy but brittle clay, the difference between the texture of the light-textured surface horizon and the heavy intermediate horizon being very wide in the sandy types. The soils having the heaviest intermediate horizon, though not usually those with the widest difference between the upper and intermediate horizons, are those of the Davidson series, while the clay loam and sandy clay loam types of the Cecil series are of much the same character.

The other subgroup of these soils includes the types of the Norfolk, Orangeburg, Ruston, Greenville, Kalmia, and Wickham series,

in all of which the intermediate or relatively heavy layer is a sandy clay. The surface soils in this subgroup are generally very light in texture, usually sands or light loamy sands.

The chemical composition of the several soils of Bibb County has not been determined directly. No analyses of samples from this county have been made. Samples of the most important types found in Bibb County, collected from localities where these soils have been mapped in other States, have been analyzed in the laboratories of the Bureau of Soils. The following table gives the results of these analyses; the type analyzed and the locality being given in each case:

*Chemical analyses of Greenville sandy loam*

[Samples collected 1 mile west of Evergreen, Conecuh County, Ala.]

Chemical constituents	Sample No. 28902, 0 to 4 inches	Sample No. 28903, 4 to 48 inches	Sample No. 28904, 48 to 78 inches	Sample No. 28905, 78 to 114 inches
	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
SiO <sub>2</sub> .....	88.83	84.22	75.83	84.50
TiO <sub>2</sub> .....	.26	.72	.44	.39
Fe <sub>2</sub> O <sub>3</sub> .....	1.54	4.42	10.90	5.83
Al <sub>2</sub> O <sub>3</sub> .....	3.70	7.50	5.37	5.96
MnO.....	.174	.039	2.85	.03
CaO.....	.38	.17	.30	.23
MgO.....	.16	.13	.11	.08
K <sub>2</sub> O.....	.35	.32	.23	.19
Na <sub>2</sub> O.....	.01	.01	.01	.01
P <sub>2</sub> O <sub>5</sub> .....	.02	.07	.08	.10
SO <sub>3</sub> .....	.09	.09	.06	.11
Ignition loss.....	5.32	2.97	3.93	2.82
Total.....	100.83	100.65	100.11	100.25
N.....	.12	.03	.02	.02
H <sub>2</sub> O at 110° C.....	.93	.93	.90	.52

*Chemical analyses of Norfolk sandy loam*

[Samples collected 4 miles east of Dothan, Houston County, Ala.]

Chemical constituents	Sample No. 32333, 0 to 6 inches	Sample No. 32334, 6 to 10 inches	Sample Nos. 32335 and 32336, 10 to 37 inches	Sample No. 32337, 37 to 49 inches	Sample No. 32338, 49 to 80+ inches
	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
SiO <sub>2</sub> .....	91.23	91.94	85.18	82.06	81.96
TiO <sub>2</sub> .....	.40	.43	.60	.56	.66
Fe <sub>2</sub> O <sub>3</sub> .....	.48	.58	1.14	1.17	1.25
Al <sub>2</sub> O <sub>3</sub> .....	3.81	4.65	9.06	11.58	11.67
MnO.....	.015	.012	.008	.003	.008
CaO.....	.01	.01	.01	.01	.01
MgO.....	.01	.01	.01	.01	.01
K <sub>2</sub> O.....	.10	.08	.13	.09	.09
Na <sub>2</sub> O.....	.15	.17	.19	.17	.16
P <sub>2</sub> O <sub>5</sub> .....	.02	.02	.01	.01	.02
SO <sub>3</sub> .....	.02	.03	.03	.05	.02
Ignition loss.....	3.88	2.56	3.65	4.26	4.17
Total.....	100.12	100.49	100.01	99.97	100.02
N.....	.035	.002	.008	.004	.002
H <sub>2</sub> O at 110° C.....	.61	.42	.52	.55	.52

*Chemical analyses of Orangeburg sandy loam*

[Samples collected at Bennettsville, S. C.]

Chemical constituents	0 to 5½ inches	5½ to 12½ inches	12½ to 24 inches	24 to 36 inches
	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
SiO <sub>2</sub> .....	87.08	89.04	75.85	59.20
TiO <sub>2</sub> .....	1.01	1.46	1.54	1.34
Fe <sub>2</sub> O <sub>3</sub> .....	.94	1.30	3.65	6.66
Al <sub>2</sub> O <sub>3</sub> .....	3.65	4.70	12.60	22.06
MnO.....	.08	.04	.03	.03
CaO.....	.09	.04	.05	.04
MgO.....	.01	.03	.03	.05
K <sub>2</sub> O.....	.14	.08	.22	.28
Na <sub>2</sub> O.....	.10	.12	.12	.12
P <sub>2</sub> O <sub>5</sub> .....	.01	.01	.02	.03
SO <sub>3</sub> .....	.02	.03	.04	.01
N.....	.05	.01	.01	.01

*Chemical analyses of Cecil clay loam*

[Samples collected 6 miles west of Lanett, Chambers County, Ala.]

Chemical constituents	Sample No. 32352, 0 to 7 inches	Sample No. 32353, 7 to 24 inches	Sample No. 32354, 24 to 59 inches	Sample No. 32357, 240 to 300 inches
	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
SiO <sub>2</sub> .....	67.15	53.06	52.51	57.84
TiO <sub>2</sub> .....	2.10	1.63	1.34	1.28
Fe <sub>2</sub> O <sub>3</sub> .....	9.48	11.55	11.66	9.59
Al <sub>2</sub> O <sub>3</sub> .....	11.26	21.01	22.10	18.38
MnO.....	.10	.07	.07	.17
CaO.....	Trace.	Trace.	Trace.	Trace.
MgO.....	.71	1.02	1.80	2.66
K <sub>2</sub> O.....	1.02	1.26	2.12	3.26
Na <sub>2</sub> O.....	.40	.34	.33	.31
P <sub>2</sub> O <sub>5</sub> .....	.16	.14	.15	.17
SO <sub>3</sub> .....	.10	.09	.08	.03
Ignition loss.....	8.65	10.08	8.72	6.47
Total.....	101.13	100.25	100.88	100.16
N.....	.10	.02	.002	None.
H <sub>2</sub> O at 110° C.....	1.30	1.75	1.90	.85

The various soils of Bibb County are grouped into series on the basis of the detailed features of the soil section or profile. The series include types differentiated according to texture, or the proportions of sand, silt, and clay in the surface soils. The type is the unit of classification and mapping. Eighteen types and two phases, included in 15 series, and the miscellaneous soil classed as Meadow, are mapped in Bibb County.

In the Cecil series the sandy types have a dark-gray to brown layer of an inch or two, passing into a pale-yellow, friable to loose layer of 4 to 6 inches, then into a reddish-yellow, friable layer for a few inches. In the heavier members there is usually a friable surface layer of a brown to reddish-brown color. The above layers constitute the surface soil or horizon A. The subsoil or horizon B is a bright-red to deep-red, hard, brittle clay, which breaks into irregular-shaped lumps and extends to depths of 3 to 8 feet or more. Below this is encountered a light-red, friable, micaceous clay, which grades at 1 to 2 feet into a light-gray or yellowish, partially decomposed soft rock, and this passes into the light-gray disintegrated granites, gneisses, and schists from which the soils are derived. The Cecil

clay loam, with a hilly phase, and sandy clay loam are mapped in Bibb County.

The types of the Davidson series, below a shallow covering of leaf mold, are reddish brown to red to a depth of 5 to 15 inches, the material being friable. The subsoil is a dark-red to maroon-red, firm, stiff, but brittle clay, which is comparatively free from quartz sand, has a smooth feel, and extends to depths of 3 to 10 feet. Lying immediately below the subsoil is a layer of yellowish-red or ocherous-colored, friable material; this passes into a yellowish, soft rock, which quickly grades into the solid rock. These soils are derived from dark-colored, basic, igneous rocks, such as diorite, diabase, and hornblende schist. The Davidson clay loam is the only type mapped in this county.

The surface soils of the Appling series have a gray to brown surface layer of an inch or two, and a yellowish-gray or grayish-yellow layer, which grades at a depth of 5 to 8 inches into a yellow or reddish-yellow layer. The materials of these layers are friable and sandy. The subsoil, beginning at 12 to 15 inches, is a reddish-yellow to yellowish-brown clay, rather stiff, but friable. Usually at 24 to 30 inches a mottled or streaked light-red and yellow, stiff, but brittle clay is encountered, and this grades at 4 to 6 feet into the partly weathered, mottled red, yellow, bluish, and light-gray material that overlies the hard rock. These soils are derived from the weathering of light-colored gneisses, granites, and schists. The Appling sandy loam is the only type mapped in the area.

The types of the Wilkes series have a gray to brownish-gray surface layer passing at 1 to 4 inches into a yellowish-gray to pale-yellow layer which extends to a depth of 6 to 10 inches. These layers are friable and generally sandy. The subsoil consists of yellow, reddish-yellow, or mottled red and yellow, friable sandy clay, which passes within a few inches into heavy, tough, plastic clay, brownish yellow or brown to reddish in color. Below this at 24 to 30 inches is the disintegrated, greenish-yellow or mottled gray and whitish, soft, partly decomposed rock. These soils are derived from laminated gneisses and aplitic granites cut by dikes of diorite or diabase. The Wilkes sandy loam is the only type mapped in Bibb County.

The Bradley series is composed of types characterized by a gray or brownish-gray layer of 1 to 3 inches, passing into a pale-yellow layer which extends to depths of 6 to 15 inches. These layers are friable and are very sandy in texture. The subsoil is a bright-red to deep-red, heavy, stiff but brittle clay, which grades at varying depths into lighter-colored, more friable material, and finally into granites, gneisses, and schists. The surface layers (or horizon A) consist of coastal plain material, and the underlying layers are of residual material similar to the subsoil of the Cecil series. These soils are developed only along the border line of the Coastal Plain and Piedmont Plateau. The Bradley sandy loam is the only type occurring in this county.

The Norfolk series is characterized by 2 to 4 inches of gray to brownish-gray friable material, and below this to a depth of 12 to 16 inches by a pale-yellow or grayish-yellow, friable, single-grained, light-textured sandy material, these constituting horizon A. The subsoil, or horizon B, to a depth of 30 to 50 inches is a yellow,

friable sandy clay or sand. Beneath this is horizon C, which is a mottled brownish or light-red, yellow, and light-gray or whitish, brittle sandy material. In places streakings and blotchings are very noticeable. Usually the redder coloration lies immediately below the subsoil. Two types, the Norfolk sandy loam, with a deep phase, and the sand, are developed in this area.

The types of the Orangeburg series have a surface layer of 1 to 3 inches of grayish-brown material, and a subsurface layer, extending to a depth of 10 to 18 inches, of yellow to brownish-yellow, friable, single-grained material. (These two layers comprise horizon A.) The typical subsoil (or horizon B) consists of bright-red sandy clays of a crumbly structure, or of loamy sands, extending to depths of 40 to 100 inches or more. Below this is horizon C, consisting of a mottled or streaked red, yellow, and whitish, hard but brittle material. The Orangeburg sandy loam is the only member of this series mapped in Bibb County.

The types of the Ruston series have 1 to 3 inches of gray or grayish-brown material and a layer of yellow or brownish-yellow, friable, single-grained material reaching downward to a depth of 10 to 18 inches. The subsoil (or horizon B) consists of reddish-yellow, yellowish-red, or yellowish-brown sandy clay of a crumbly structure extending to depths of 30 to 60 inches or more. This is underlain by a mottled yellowish-red, yellow and light-gray, hard but brittle material. Usually the red mottlings diminish and shades of gray increase with depth. The Ruston sandy loam was mapped.

The types of the Greenville series are brown to reddish brown in the surface portion, usually loamy and friable, the first inch or two in virgin areas containing a small proportion of organic matter. The subsoil consists of red, moderately friable clays, heavy sandy clays, or loamy sands. Usually at depths of 40 to 80 inches a mottled or blotched purplish-red, gray, yellow, and whitish, hard but brittle clay is encountered. Small, rounded, brown to black iron accretions are present on the surface of the heavier types, and a concentration of these occurs locally where the subsoil grades into the unweathered parent material. Only one type, the Greenville sandy loam, is mapped.

The soils of the Hoffman series have gray surface layers of 1 to 3 inches, grading into pale-yellow or grayish-yellow layers extending to depths ranging from 6 to 30 inches. These layers are sandy, friable, and of single-grained structure. Underlying this is a mottled pink, purplish, gray, reddish, and white, compact but brittle sandy clay, without any definite color or texture. The Hoffman sandy loam is the only type mapped in Bibb County.

The types of the Grady series are distinguished by a dark-colored or gray surface layer 3 or 4 inches thick, passing into a light-gray subsurface layer mottled with brown or yellow, which grades into a heavy, tough, rather plastic subsoil, mottled with gray, brownish yellow, and some red or purple. No definite soil profile is developed. The Grady clay loam is mapped in this county.

The types of the Kalmia series have A-1 horizons of 2 to 4 inches of grayish-brown soil and A-2 horizons of pale-yellow friable material to depths of 14 to 18 inches. Horizons B, to depths of 40 to 60 inches, are yellow, friable sandy clays or sands.

Horizons C are mottled purplish-red, yellow, and whitish, friable materials containing a few soft iron accretions. The Kalmia sandy loam is mapped in the area.

In the Augusta series the soils have gray layers of 1 to 4 inches, passing into pale-yellow layers that extend to depths of 10 to 15 inches. These layers are friable, generally sandy, and of single-grained structure. The upper part of the subsoils is a yellowish, pinkish, or salmon-colored, friable, sandy clay. This layer is only a few inches thick and is underlain by a mottled white, light-gray, yellow, and purplish-red, friable sandy clay. Small scales of mica are present in the subsoils. The Augusta sandy loam is mapped in the county.

The types of the Wickham series have grayish-brown to brown surface soils, over light-red to yellowish-brown, firm but brittle clay subsoils. Usually at 4 to 6 feet these are underlain by light reddish-yellow, friable materials. Small mica scales are common in the subsoils and substrata. Only one type, the Wickham sandy loam, is mapped.

The types of the Congaree series have brown to grayish-brown surface soils and light-brown subsoils. The material throughout the soils and subsoils is friable, contains mica scales, and shows very little difference in the soil section from its surface downward to a depth of several feet. The Congaree fine sandy loam and silty clay loam are mapped in this county.

Meadow represents mixed material in the first bottoms so variable that no type distinction could be made. It is poorly drained and some of it is saturated throughout the year.

The soil types are described in detail in subsequent pages of this report. Their distribution is shown on the accompanying soil map. The table below gives the acreage and proportionate extent of each soil type.

*Areas of different soils*

Soil	Acres	Per cent	Soil	Acres	Per cent
Norfolk sandy loam.....	21,056	15.7	Appling sandy loam.....	3,392	2.1
Deep phase.....	4,224		Cecil sandy clay loam.....	2,880	1.8
Wilkes sandy loam.....	22,720	14.2	Davidson clay loam.....	2,560	1.6
Congaree silty clay loam.....	21,568	13.5	Congaree fine sandy loam.....	2,560	1.6
Cecil clay loam.....	11,648	10.9	Bradley sandy loam.....	2,048	1.3
Hilly phase.....	5,760		Wickham sandy loam.....	1,408	.9
Norfolk sand.....	16,768	10.5	Augusta sandy loam.....	960	.6
Hoffman sandy loam.....	12,800	8.0	Orangeburg sandy loam.....	768	.5
Meadow.....	9,280	5.8	Grady clay loam.....	512	.3
Greenville sandy loam.....	6,848	4.3			
Ruston sandy loam.....	5,504	3.4			
Kalmia sandy loam.....	4,736	3.0			
			Total.....	160,000	-----

CECIL SANDY CLAY LOAM

The Cecil sandy clay loam consists of a reddish-brown sandy clay loam to a depth of 5 to 8 inches, the first inch or two containing some organic debris in forested areas. A large part of the type has a surface soil of 4 to 6 inches of gray to brown or yellowish-gray sandy loam, loose and friable, or a surface soil of a red to reddish-brown clay loam to a depth of 2 to 4 inches. All of the type has

a subsoil of light-red to deep-red, stiff but brittle clay extending to depths of 3 to 10 feet or more. Underlying this is a reddish-yellow, friable material. In plowed fields the surface presents a spotted appearance due to the presence of small spots of Cecil sandy loam and Cecil clay loam intricately mixed, the individual areas of each being too small to separate on the soil map. Evidently the area of Cecil sandy clay loam was formerly an area of Cecil sandy loam, from which erosion has in places removed the sandy covering. This type of land is locally known as "mulatto" or "calico" land because of its varied or checkered appearance.

Several small areas of typical Cecil sandy loam were included with the sandy clay loam. The largest of the sandy loam areas are near Colaparchee Creek, south of Howard Chapel, and along the Monroe County line southwest of Lorane. Several gravelly areas are included, the gravel consisting principally of angular quartz fragments, but in places near the fall line the gravel is rounded and seems to be a remnant of a mantle of coastal plain material which has been almost entirely removed. Several such areas west and northwest of Shiloh Church are indicated on the soil map by gravel symbols.

The Cecil sandy clay loam has a rolling to hilly topography and near the larger streams it is rather steep and broken in places. It appears to have been developed principally through the washing away of part of the sandy surface layer of Cecil sandy loam, thus exposing the typical red Cecil subsoil in patches. It occurs chiefly in scattered areas in the northwestern part of the county, few of which contain over 200 acres. Several small areas are mapped in the northeastern part of the county. Surface drainage is well established throughout the type, but becomes too rapid on the slopes unless prevented by terracing.

About 75 per cent of the type has been cleared, the remainder being allowed to remain in forest because of somewhat broken and unfavorable topography or gravelly surface. This type is generally included in farms with several other soil types, and the yields reported vary considerably. Cotton is the principal crop, and under present conditions where well fertilized, it yields a little higher than on the clay loam, the yield ranging from one-eighth to one-half bale per acre with an average of about one-fourth bale. Corn yields from 10 to 35 bushels per acre, averaging about 15 bushels. Cowpeas are grown to a considerable extent for hay and yield about the same as on the Cecil clay loam.

Owing to the more open texture of the surface soil of the Cecil sandy clay loam, it has a greater water-holding capacity than the clay loam, and crops suffer less from unseasonable wet and dry spells. It has about the same range of crop adaptation as the Cecil clay loam, but the land is more easily plowed and cultivated. It is a general farming soil, well suited to the production of legumes, such as alfalfa and vetch, and to grain and grass. Peaches and pecans do well.

This type of land sells for \$20 to \$65 an acre, depending upon the location, improvements, and the quality of the associated soils.

The growing of legumes, addition of organic matter, and deeper plowing will increase the productiveness; care of the terraces will

prevent erosion; and rotation of crops will aid in the maintenance of fertility and the control of plant diseases and insect pests.

#### CECIL CLAY LOAM

The Cecil clay loam in virgin areas consists of a brown to brownish-red clay loam to loam or heavy sandy loam to a depth of 3 or 4 inches, where it passes abruptly into a red, heavy, stiff, brittle, gritty clay subsoil. This red clay extends to depths of 3 to 6 feet or more. Below this is a reddish-yellow, friable, micaceous material, which overlies the rotten rock. Mica flakes are commonly present. The subsoil is plowed up in cultivated fields and is exposed in shallow gullies or gall spots. In places angular fragments of quartz rock are found on the surface, but the soil is not typically stony. It is derived principally from acid rocks or those high in silica, such as granite, mica schist and hornblende schist.

Where hornblende schist and granite are the parent formations the soil has a darker surface color and resembles the Davidson clay loam, but differs from it in having a lower lime content. Areas of this kind occur in the northwestern part of the county near Union Church and northward toward Lorane and west of Rockmill. In places the boundary between this variation of the Cecil clay loam and the typical Davidson clay loam is difficult to establish and these areas have been separated arbitrarily. Some true Davidson clay loam areas too small to separate are included with this type. Near the Monroe County line another variation has been included, in which at a depth of 24 to 30 inches the content of mica is much higher than in the typical Cecil soils and imparts a rather slick, soapy feel, like that of Madison clay loam. Small patches of Cecil clay and Cecil sandy clay loam occur in this type, especially on slopes and hillsides, along drainage ways, and on low knolls.

The Cecil clay loam occurs in the northern and northwestern parts of the county, the largest areas being mapped north of Rivoli and the Thomaston road and west of the Ocmulgee River. A few small scattered areas are mapped in other parts. The type occupies fairly large bodies in the vicinity of Lorane, Union Church, and along Rocky Creek north of Doles Church. It has a rolling or hilly topography, the smoothest areas being on ridge crests and upper slopes. Along the Ocmulgee River near Holton, and where the uplands are severely dissected by drainage ways, the steeper slopes usually consist of the hilly phase of the Cecil clay loam or the Wilkes sandy loam.

The topography is favorable to thorough drainage and the run-off is rapid on the slopes, so that the construction of terraces is necessary to prevent erosion. On the steeper slopes these terraces can not be constructed sufficiently flat to be plowed across and they are usually sodded to Johnson or Bermuda grass, or briers, plum bushes, and wormwood are allowed to grow upon them to protect them from washing. The compact structure of the subsoil retards internal drainage to a considerable extent.

About 75 per cent of the type has been cleared, and practically all of the original forest growth, which consisted principally of oak, hickory, short-leaf pine, and long-leaf pine, has been removed. The

present forest cover is principally second growth and most of it has little commercial value.

The Cecil clay loam is naturally a strong durable soil and is productive where carefully handled. Most of it has been farmed for a long period and has a low content of organic matter. This type is used for the production of corn and cotton, with cowpeas, velvet beans and some grain as secondary crops. The yields vary with the fertilizer treatment and farming methods. Cotton under present conditions yields on an average about one-fourth bale per acre. Corn yields 12 to 20 bushels per acre, although where the crop is given more care 25 to 30 bushels are obtained. Grain and hay crops produce well. Several dairies have been established on this soil. Cowpeas yield one-half to 1 ton of hay per acre. This type is not particularly suited to truck crops, although potatoes and cabbage do well.

The Cecil clay loam is rather difficult to handle and requires heavier implements than the sandy land soils. If plowed when wet, clods are formed that are very difficult to break, and when dry it is hard to plow, so that it can be handled only through a narrow range of moisture conditions and after a rain can not be worked for several days. This tends to make the soil somewhat later than the sandy types and during the growing season allows weeds and grass to make considerable headway against the corn and cotton crops. The land packs badly if grazed much in wet weather. During dry spells crops suffer considerably because of the comparatively low moisture-holding capacity of the soil.

Farms which include Cecil clay loam range in price from \$20 to \$60 an acre, depending on the improvements, location, and topography.

In Jones and Jasper Counties this soil is used extensively for peaches and pecans, and alfalfa has been successfully grown after lime has been applied. It is well suited to grain and grass production.

Deeper plowing, the rotation of crops, and the incorporation of vegetable matter, such as a crop of rye or some legume, would increase the moisture-holding capacity and improve the tilth of the soil. Application of lime will make it less liable to puddle and run together.

*Cecil clay loam, hilly phase.*—The hilly phase of the Cecil clay loam consists of areas which are steep, hilly, usually severely eroded and gullied, and in places stony. About 30 per cent of it is cleared and used for pasture, although it is not commonly of much value as it produces a scant grass sod. In places it is a succession of gullies and almost worthless. In a few places where the slopes are not so severely gullied, small fields are farmed, but with considerable difficulty and low returns. This phase occurs in large areas in the northern part of the county near Holton, along the Ocmulgee River and Beaverdam Creek, along Walnut Creek, around the outskirts of Macon, and in scattered areas along the courses of Rocky and Tobesofkee Creeks in the northwestern part of the county. Some areas of rock outcrop are included. This phase is best suited to forestry.

## DAVIDSON CLAY LOAM

The surface soil of the Davidson clay loam is a dark-red or dark reddish-brown friable clay loam to a depth of 5 to 8 inches, underlain by a dark-red or maroon, stiff, smooth, fairly friable clay subsoil extending to a depth of 4 to 8 feet. Locally it is known as "chocolate land" from its dark color. This land does not scour clean from the plow owing to a slightly sticky quality, and the furrow side is not smooth, but has a somewhat rippled appearance; the type is sometimes referred to as "push land," "dead land," or "snuff-colored land." The parent basic rock formation, principally diorite, diabase, and gabbro, which are high in lime feldspar, are weathered deeply and the type is generally free from stone.

Small areas along slopes of drainage ways through the type have a surface soil that is heavier and somewhat lighter red in color than typical. If such areas were of large extent they would be mapped as Davidson clay.

This type occurs only in the northwestern part of the county, the largest areas being mapped near Lorane and Holton and in the vicinity of Rockmill. Its topography varies from gently rolling and smooth, as on ridge crests and slopes, to somewhat broken and hilly, as near the river in the vicinity of Holton.

About 90 per cent of the type is cleared of its original forest growth, which consisted principally of hardwoods, such as oak and hickory, with some short-leaf pine. Its topography is favorable to the use of tractors and improved implements and its heavy character necessitates the use of heavy tillage implements. The surface is good and the run-off is apt to be excessive, resulting in erosion unless the slopes are protected by terraces.

The Davidson clay loam is considered by the farmers to be the best soil in the Piedmont section of Bibb County. It is naturally a strong and productive soil well suited to general farm crops, and its favorable topography makes it highly desirable for general farming. It must be worked in a favorable moisture condition or it will clod badly, so that its proper preparation and cultivation are somewhat difficult.

Cotton produces from one-fourth to three-fourths bale per acre. This soil produces a rather heavy plant, and in places the cotton suffers badly from boll-weevil infestation. Corn yields 20 to 60 bushels per acre, averaging between 20 and 30. Oats are well suited to this soil and produce an average of about 25 bushels per acre, although yields as high as 50 bushels are reported. Wheat is grown to a small extent. Cowpeas produce from one-half to 1 ton of hay per acre. Velvet beans are grown to some extent. Alfalfa is well suited to this soil and has been successfully grown near Lorane. Several commercial peach orchards have been set out on this type near Lorane and fruit of excellent quality and high color is produced which is preferred by buyers to that grown on the sandy lands. Hiley and Elberta are the principal varieties grown. Pecans do well and a number of trees have been planted. This soil warms up more slowly in the spring than the sandy soils and the fruit ripens later.

The price of the Davidson clay loam varies considerably. Where it has a favorable topography and is situated near good roads it

sells for \$60 to \$150 an acre, and in other places it sells for less, depending upon location, improvements, and kind and value of the associated soils.

This soil is suited to grains, legumes, and hay grasses. Its content of lime and excellent drainage makes it particularly adapted to alfalfa. The condition and productiveness of the soil can be improved by the incorporation of coarse vegetable matter, which would tend to make it more porous, increase its moisture-holding capacity, assist in controlling erosion, and make it more easily plowed. The adoption of a rotation including cowpeas or other legumes will aid in the maintenance of soil fertility.

#### APPLING SANDY LOAM

The surface soil of the Appling sandy loam in virgin areas consists of 1 to 3 inches of gray or brownish-gray loamy sand passing into a pale-yellow to yellowish-gray loamy sand or light sandy loam which extends to a depth of 6 to 8 inches. It is underlain by a yellow to brownish-yellow heavy sandy loam to friable sandy clay, passing at about 12 to 15 inches into a reddish-yellow friable clay, which quickly grades into a mottled red and yellow, rather compact but brittle and gritty clay or heavy sandy clay. In cultivated fields the surface soil to a depth of 5 to 6 inches has a light color, usually gray or yellowish gray.

In places, especially on slopes, some angular quartz fragments are present on the surface and through the subsoil. These areas are shown on the map by gravel symbols. In some places the Appling sandy loam grades toward the Cecil sandy loam, and the red color predominates in the subsoil with slight gray and yellow mottlings. A few small areas having a yellow sandy clay subsoil, resembling the Durham sandy loam, are included. Along the road east of Midway Church this type has what appears to be a thin covering of Coastal Plain material, including a few rounded pebbles and gravel. The soil here seems to be somewhat less productive than the typical Appling sandy loam, and resembles the Wilkes soils. In the vicinity of Montpelier the soil is very much mixed and includes spots of Cecil and Wilkes soils.

The largest areas of the Appling sandy loam occur in the western part of the county in the region between Howard Chapel, Lizella and Montpelier. It occupies undulating to rolling land, smooth ridge tops, and gentle slopes, and it also occurs on slopes of ridges having Cecil clay loam on the crests. In places it occupies smooth ridges in close association with the Wilkes sandy loam, which usually occupies the slopes. In some places it includes small galled and eroded spots which, if of sufficient size, would be classed with the Wilkes sandy loam. The type is derived from light-colored granite, and the stony fragments are usually quartz rock. The surface drainage is generally well established, but the compact lower subsoil interferes to some extent with the internal drainage, and at the base of gentle slopes the type in places is seepy. The imperfect internal drainage, which prevents thorough aeration, is probably responsible for much of the mottling of the subsoil, and in wet seasons results in damage to crops.

About 70 per cent of the type is cleared and about half of the cleared land is cultivated; the remainder is allowed to lie out or is used to some extent for pasture. Cotton and corn are the principal crops. The yields average lower than on the Cecil soils, cotton yielding one-eighth to one-fourth bale per acre, and corn 10 to 20 bushels with an average of 15 bushels per acre. Cowpeas, velvet beans, some peanuts and potatoes are grown. Along the fall line, where this soil is associated with the Norfolk sandy loam, deep phase, it is included in several peach orchards, and the trees planted on it are thriving.

The Appling sandy loam, always included with other types in farms, sells for prices ranging from \$15 to \$50 an acre, depending upon location, improvements, and the kind of associated soils.

Organic matter is one of the principal needs of this soil and the turning under of vegetable matter is necessary for increasing productivity. Liberal applications of fertilizers are needed for all crops. In some sections of North Carolina this type is successfully used in the production of bright-leaf tobacco.

#### WILKES SANDY LOAM

The surface soil of the Wilkes sandy loam in virgin areas has a gray to brownish-gray layer of sandy loam, passing at 1 to 4 inches into a pale-yellow or yellowish-gray sandy loam, which extends to a depth of 6 to 10 inches. The subsoil is extremely variable in color and structure. In places it is a mottled rusty-brown, yellow, and gray, stiff plastic clay to a depth of about 24 inches, where it grades into the rusty-brown, yellow, and whitish, partly decomposed parent rock. In other places the subsoil is a mottled reddish-brown, yellow, and gray brittle clay, passing at 12 to 15 inches into a mottled pale-yellow, reddish-brown, and greenish plastic clay and below 20 inches consisting of a mass of partly decomposed fragments of parent rock. Fragments of quartz rock are scattered over some of the slopes.

Near St. Dennis Church and Montpelier the greenish tinge of the plastic clay subsoil is pronounced in some of the flatter places, and if these spots were of greater extent they would be mapped as Iredell sandy loam. Along the Monroe County line above Holton, where the type is associated with Davidson clay loam, it includes small areas of Mecklenburg sandy loam which have a brown subsoil to a depth of about 20 inches, where the parent rock is encountered.

The Wilkes sandy loam is typically developed from light-colored binary or aplitic granite from which it derives its light color, but in Bibb County it is derived from a number of different rock formations, including hornblende, granite, diorite, and mica schist.

This type is the most extensive in the county but is not of much agricultural importance. It has a gently rolling to hilly and broken topography and is associated with all of the upland Piedmont soils. It occurs principally in large areas across the north-central part of the county and occupies the hilly country on each side of the Ocmulgee River above Macon, along Rocky and Tobesofkee Creeks, west of Macon and north of Lizella, and extends across the western part of the county to Echeconnee Creek. South of Lizella it occupies the slopes of drainage ways adjacent to Norfolk soils. It has good surface drainage, but the heavy impervious nature of the subsoil hinders

the absorption of rain water, and erosion is severe, many slopes being so badly gullied and galled that they resemble "bad lands." In such places most of the soil materials have been washed away, exposing the whitish, partly weathered rocks.

About 75 per cent of the type has been cleared of its original timber growth, which consisted of pine, red elm, water and other oaks, beech, and haw; but at present much of it is covered with a scraggly growth of pine, scrub oak, some gum, and sumac, fennel, and blackberry bushes. About 10 per cent of the type is farmed, the remainder being allowed to lie idle.

Because of the shallow soil, tough subsoil, and broken topography, most of the type is unsuited to agriculture and affords but poor pasture. It produces best in seasons of moderate rainfall. Where farmed it yields about one-tenth bale of cotton per acre and 5 to 12 bushels of corn. Fertilizers are used to some extent but only light applications are made. Some crab-grass hay is cut. The type is included with other soils in several peach orchards but does not seem well suited to peaches, although pears thrive and produce well on level areas.

The land is of low agricultural value and sells for \$10 to \$15 an acre, depending on the kind of associated soils and the location.

The type requires protection from erosion and the incorporation of vegetable matter for improvement and increase in crop production. Most of it is best suited to forestry and grazing.

#### BRADLEY SANDY LOAM

The Bradley sandy loam is developed along the border between the Piedmont and Coastal Plain sections where the coastal plain material overlaps the piedmont material. The surface soil has from 1 to 3 inches of gray to brown loamy sand passing into grayish-yellow sand and extending to a depth of 6 to 10 inches. This is underlain by a brownish-red friable sandy loam subsoil, which grades at about 15 to 18 inches into a red, stiff, brittle, gritty clay, or sandy clay. The sand grains of the surface soil vary from fine to medium and are rounded and waterworn, in contrast with the sharp, gritty Piedmont sand. The subsoil material is typical of the Cecil soils. In places rounded gravel and small cobblestones are present on the surface and through the subsoil.

This type occupies smooth ridge crests and upper slopes and most of it can be farmed with improved implements. In places the Coastal Plain soils occur on the ridge tops, the Bradley sandy loam occupies the upper slopes, and the Piedmont soils are developed on the lower slopes. The type is mapped in small areas scattered over the west-central portion of the county. The largest occur southeast of Holly Grove Church, west and south of Shiloh Church, near White Spring School, and south of Damascus Church, near Marshalls Mill.

The Bradley sandy loam is inextensive and of very little agricultural importance. About 85 per cent of it has been cleared and farmed or pastured. The forest growth consists of short-leaf pine, tulip poplar, gum, dogwood, and oak. Bermuda grass produces an excellent pasture. This soil is suited for general farming and for alfalfa, fruit, and vegetables. After liming and inoculation it has

produced 3 to 4 tons of alfalfa per year from four or five cuttings. Corn planted after the alfalfa has yielded 40 bushels per acre. Corn yields from 15 to 25 bushels per acre and cotton one-eighth to one-half bale. Cowpeas and velvet beans are grown to some extent for hay and pasturage. Peaches and pecans are thriving near Lizella.

Land of this kind ranges in price from \$20 to \$50 an acre, depending on improvements and the productiveness of the associated soils. The areas that have the roughest surface and are gravelly are best suited to forestry.

#### NORFOLK SAND

The Norfolk sand in virgin areas consists of a gray to grayish-brown sand, grading at 2 to 5 inches into a yellow sand which continues unchanged to depths of 3 to 6 feet or more. Locally at depths below 3 feet there is a slight mottling of reddish yellow in the form of accretions. Northeast of Mount Pleasant Church the subsoil consists of coarse sand. Small quartz gravel is encountered through the soil and subsoil.

This type occurs chiefly in two large bodies, the larger being located south of Tobesofkee Creek, between Skipperton and Lizella, and the other in the northeastern part of the county, near Mogul. Smaller areas are mapped in the vicinity of Bloomfield Church, on the south side of Stone Creek, near Franklinton, and scattered over the eastern part of the county.

The Norfolk sand has a smooth and almost level to rolling and somewhat hilly topography. It is thoroughly drained, and because of its open porous structure it loses soil moisture by evaporation very rapidly, so that crops suffer quickly during droughts. It is low in organic matter and natural fertility, being composed largely of quartz sand. About 60 per cent of the type has been cleared of its forest cover, but less than one-fifth of it is farmed; the remainder lies out or is forested. The unused fields are covered with a growth of dog fennel, some broom sedge, podick, tickle grass, and yucca or bear grass. The tree growth in the wooded areas consists of a scattering of scrub oak, pine, and sassafras. Corn, cotton, and sweet potatoes are the principal crops. Corn yields 10 to 15 bushels per acre, cotton about one-tenth to one-eighth bale when fertilized, and sweet potatoes 60 to 100 bushels. Sugar cane and sorgo are grown to some extent, mainly in wet places along small branches. Portions of several peach orchards are located on this type and produce early fruit. Melons and peanuts are grown to a small extent.

This type requires heavy fertilization, and much of the fertilizer applied is lost through leaching. Where located near markets or shipping points it is suitable for a certain amount of trucking. In North Carolina it is used for the production of blackberries and dewberries.

#### NORFOLK SANDY LOAM

The surface soil of the Norfolk sandy loam, in virgin areas, to a depth of 2 to 4 inches, is a gray or brown loamy sand, the dark color being due to the presence of organic matter. The subsurface layer is a pale-yellow to grayish-yellow loamy sand extending to

depths of 12 to 16 inches. The true subsoil is a yellow sandy clay of a friable, granular structure. This is underlain at 34 to 48 inches by a streaked or mottled brownish-red, light-gray and yellow, friable material. In places a thin red or mottled red and yellow layer underlies the subsoil. On cultivated fields the surface soil of 5 to 7 inches is a light-gray to yellowish-gray loamy sand, the color depending on content of organic matter and the manner in which the soil has been handled.

In the vicinity of Bethel Church in the southwestern part of the county the soil contains considerable coarse sand and would have been mapped as Norfolk coarse sandy loam if of sufficient extent. The depth of the surface layer of sand or loamy sand varies somewhat, and in the vicinity of areas of sand the type includes some Norfolk sandy loam, deep phase.

The Norfolk sandy loam is extensive in the Coastal Plain section of Bibb County. Large areas are mapped near Paynes, southwest of Macon, in the vicinity of Union School and Shiloh Church, and from Lizella across the southwestern and southern parts of the county below the sand hills to the vicinity of Walden and Avondale. Smaller scattered areas are mapped in the eastern part of the county.

The type has a level to gently rolling topography, with long, flat-crested ridges, knolls, and gentle slopes. Tractors can be used over practically all of it. The surface drainage is well established and the porous structure of the subsoil permits the ready downward movement of excess water, so that the land does not erode as rapidly as the Piedmont soils. However, flat terraces on the slopes are very beneficial in preventing too rapid run-off.

About 90 per cent of the type is cleared of its forest growth and is cultivated or used for pasture. Short-leaf and long-leaf pines, bay, and some blackjack and scrub oaks, sassafras, and a few hickory trees are found in the forested areas, but very little merchantable timber remains.

The Norfolk sandy loam is considered one of the best cotton soils in the county and is extensively utilized for this crop. Applications of 300 to 500 pounds per acre of fertilizer, analyzing 8-3-3 or 8-4-4, are made for cotton, and yields ranging from one-sixteenth to one bale per acre are reported. Corn yields 15 to 50 bushels per acre, averaging about 20 bushels. Cowpeas, peanuts, and velvet beans are planted in the corn by most farmers and cut for hay or pastured after the corn crop is harvested. Peanuts planted alone produce 20 to 40 bushels of nuts, and one-half to 1 ton of vines which are used for hay. Sweet potatoes produce 75 to 150 bushels per acre. Oats and rye do well but are not extensively grown except for hay or as soiling crops for dairy cows. Dairying is important. Pastures include Bermuda grass, water grass, crowfoot, and crab grass.

This soil warms up early in the spring and can be worked under all moisture conditions, making it an excellent melon and trucking soil. A number of truck gardens are operated in connection with general farming. Collards, cabbage, turnips, sugar cane, watermelons, and cantaloupes are grown extensively within a distance of

10 miles from Macon, where such products find a ready market. The growing of peaches is very important on this soil, particularly near Lizella, Skipperton, and Walden, and a number of pecan trees have been planted.

The Norfolk sandy loam ranges in price from \$15 to \$75 an acre, depending upon the improvements and location. Bearing orchards range in price from \$100 to \$200 an acre.

The Norfolk sandy loam is capable of being brought to a very high state of cultivation. Being of a sandy nature, it tends to leach somewhat, and the organic matter is burned out rapidly during the hot summers, but it responds quickly to good farming practice and proper fertilization. Liberal applications of barnyard manure, or the growing and turning under of green-manuring crops, such as rye, oats, or some legume, are essential to the maintenance and increase of the fertility. Commercial fertilizer at the rate of 400 pounds of 8-3-3 or 8-4-4 grade should be applied for cultivated crops and heavier applications for truck crops. In North Carolina and parts of southern Georgia this type is used for the growing of tobacco and is highly regarded by tobacco growers. Rotation of crops would prevent the impoverishment of the land and aid in the control of the weevil and other insect pests.

*Norfolk sandy loam, deep phase.*—The Norfolk sandy loam, deep phase, differs from the typical Norfolk sandy loam principally in having a deeper surface layer of sand or loamy sand. The soil consists of 6 to 8 inches of gray sand, underlain by a light-yellow sand, grading at 20 to 24 inches into a yellow friable sandy clay or sandy loam. This phase is an intermediate soil between the Norfolk sandy loam and the Norfolk sand.

In the northeastern part of the county near Duersville Church the surface soil and subsoil are considerably coarser in texture than typical and the depth to the sandy clay subsoil varies from 22 to 26 inches. In the vicinity of Shiloh Church a few areas of gravelly sandy loam are included. At the base of slopes, where the sand has accumulated, small areas consisting of medium sand to a depth of 3 feet or more are included.

This phase has a level to gently sloping topography, is closely associated with the other Norfolk soils, and is thoroughly drained. The principal areas mapped are in East Macon, north of Duersville Church, northeast of Shiloh Church, and on the ridge crests east and south of Lizella. Other areas are scattered through the sand-hill section of the county.

About 85 per cent of the phase has been cleared of its forest growth and about half of it is cultivated to corn and cotton. Yields are considerably lower than on the typical Norfolk sandy loam, but the phase is more productive than the Norfolk sand. It produces fair crops of peanuts and potatoes, and some of it is included in peach orchards east of Lizella. Plant food leaches away rapidly, and after the land has been cropped continuously for several years the yields decrease. This phase has about the same crop adaptation as the typical Norfolk sandy loam. For improvement and maintenance of soil fertility liberal additions of vegetable matter and heavy applications of fertilizer high in potash are essential.

## ORANGEBURG SANDY LOAM

The surface soil of the Orangeburg sandy loam, in virgin areas, is a grayish-brown loamy sand passing at a depth of 1 to 3 inches into a brownish-yellow or yellow loamy sand which extends to depths of 10 to 18 inches. These two layers are mellow and friable, and of single-grain structure. The subsoil is a red, friable sandy clay which extends downward to depths ranging from 40 to 72 inches. Below this is a mottled or streaked red, yellow, and light-gray, hard but brittle material. In places the base color is red with streakings of yellow and light gray. In cultivated fields the surface soil of 5 to 8 inches is light brown to brownish gray in color.

This type is not extensive, being found only in the eastern part of the county northeast of Terrell, about 3 miles west of Terrell, and along the Jones and Twiggs County lines. It occupies smooth, flat-topped, or gently rolling ridges and upper slopes and is well drained throughout. It is associated with the Greenville and Ruston sandy loams and Norfolk sand and sandy loam.

The type is used for cotton, corn, peaches, sweet potatoes, melons, and peanuts, and to a small extent for truck crops near Franklinton. It is easily handled with light implements, warms up early, and responds quickly to applications of commercial fertilizer and manure. Crops, methods of cultivation, and farm practices are about the same as upon the Greenville sandy loam, but yields are slightly lower.

## RUSTON SANDY LOAM

The surface soil of the Ruston sandy loam in virgin areas is a grayish-brown loamy sand, 2 to 4 inches deep, grading into a brownish-yellow loamy sand or light sandy loam, which extends to a depth of 10 to 18 inches. The subsoil consists of reddish-yellow to yellowish-red or yellowish-brown sandy clay of a friable or crummy structure and has a thickness of 2 to 8 feet. Below this is a mottled red, yellow, and whitish, hard but brittle material; the upper part near the subsoil shows more red, while at 7 or 8 feet the gray and yellow colors predominate. In cultivated fields a brownish-gray to gray color prevails to the depth of plowing.

Where areas of Orangeburg or Greenville soils adjoin, the subsoil may be somewhat redder than typical, such as near Sofkee and Rutland. The substratum, usually below 4 or 5 feet, consists of highly colored indurated clay and layers of kaolin and sand, and in places the lower subsoil is rather compact and hard and resembles that of the Hoffman sandy loam. In places rounded gravel is scattered over the surface. In the northeastern part of the county the surface texture is somewhat coarser than typical, but this variation is of small extent and importance.

The Ruston sandy loam is widely distributed over the southern and eastern parts of the county. The largest bodies are mapped just south of Macon, and in irregular-shaped areas near Rutland, southeast of Sofkee, and east of Franklinton. Small areas are found southwest of Lizella. This type has an undulating to rolling surface and occurs on knolls, upper slopes, or shoulders just at the break

of the slope, the topography of practically all of it being favorable for the use of tractors and improved machinery. All of it is well drained. About 90 per cent of the type is cleared.

Much of the Ruston sandy loam is included in peach orchards, in association with Orangeburg, Greenville, and Norfolk soils, and is regarded highly by farmers. The general crops of the region are grown, and yields are about the same as on the Norfolk sandy loam. Near Franklinton this soil is used extensively for the production of potatoes, pimento peppers, and tomatoes. Potatoes yield 75 to 125 bushels per acre, peppers and tomatoes about 2 to 2½ tons per acre. The Stone, Greater Baltimore, and Early Jewell varieties of tomatoes are grown for canning. Some snap beans and garden peas are also grown for the cannery. Melons and cantaloupes are grown to a small extent, fertilizers analyzing 8-4-4 or 10-4-4 being applied at the rate of 400 to 600 pounds per acre.

This type of soil is easily cultivated, well drained, and adapted to a wide variety of crops. When carefully handled, manured, and fertilized, it is a productive soil. In boys' corn-club contests some yields of over 100 bushels per acre of corn have been produced. It needs liberal application of barnyard manure or organic matter in the form of green-manuring crops. Fertilizer applications at the rate of 400 pounds per acre of 8-3-3 or 8-4-4 grades are recommended for cultivated crops. Peaches and pecans are well suited to this type of land, and alfalfa has been profitably produced on it in other parts of Georgia.

#### GREENVILLE SANDY LOAM

The surface soil of the Greenville sandy loam in virgin areas is a dark-brown loamy sand for 1 to 2 inches, passing into a reddish-brown, light sandy loam having a depth of 5 to 10 inches. This soil is mellow and easy to handle. The subsoil to a depth of 40 to 70 inches is a deep-red, stiff sandy clay to clay, being compact but brittle when dry and sticky when wet. Underlying the true subsoil is a mottled or streaked red, yellow, purplish, and whitish, hard but brittle, unweathered material, which varies greatly in color, depth, and structure. In places the mottled purplish material immediately underlies the subsoil, and an accumulation of iron accretions is found in this layer or in the lower part of the subsoil. These small, rounded, brown accretions are present in the soil and locally are abundant on the surface. In cultivated fields the surface soil for a depth of 5 to 8 inches has a brown to reddish color.

West of Planters School and just north of Avondale several small areas are included that have a very dark brown surface soil and dark-red or maroon-colored subsoil, resembling the Blakely sandy loam.

The Greenville sandy loam has a level to undulating or gently sloping topography, with numerous small depressions or sinks occupied by Grady clay loam. In the southeastern part of the county along the Twiggs County line it is mapped upon narrow ridge crests. Tractors and modern 2-horse machinery can be used on practically all of this type. The principal areas of this soil are in the southern part of the county where they occupy a large part of the territory between Skipperton and Avondale. Other large areas are mapped in the eastern part of the county in the vicinity of Franklinton.

Small areas occur in East Macon, south of Macon, and near Newcastle School in the southeastern part of the county.

This soil is everywhere well drained, either through small natural surface drainage ways or into the sinks or ponds of Grady soil. Practically all of the type has been cleared of its forest growth and put into cultivation, only a few scattered wooded areas being found along drainage ways or steeper slopes. The construction of flat terraces on slopes aids in the prevention of erosion. The soil is easily worked and is more retentive of moisture than most of the other soils of the county. No definite crop rotation is followed, but a change from cotton to corn is made every few years.

The Greenville sandy loam is considered one of the strongest and most productive soils in the sandy-land section of Bibb County. Cotton yields from one-third to two-thirds bale per acre without any poison dustings against the boll weevil, and corn yields 25 to 60 bushels per acre. Cowpeas, velvet beans, and oats are grown by many farmers and are well adapted to this soil. Velvet beans are grown in the corn and are extensively used for fall forage and for cover crops to be turned under. Yields of 30 bushels of corn and 20 bushels of velvet beans per acre are reported on this soil near Walden. Sweet potatoes produce heavily, and yields of 100 to 175 bushels per acre are reported. The best yield, 262 bushels per acre, produced in Bibb County in 1922 was on a field of Greenville sandy loam. Cabbage, turnips, cantaloupes, watermelons, peanuts, and truck crops are grown extensively on this soil in the southern part of the county. The type is recognized as one of the finest peach and pecan soils in the Coastal Plain and a number of large commercial orchards are located on it. In the famous Fort Valley peach section the Greenville sandy loam is the most highly regarded soil for peaches, as it is said to produce more highly colored fruit. Most growers have several varieties of peaches that mature at successive periods. The common varieties are Mayflower, Carman, Hiley, Belle of Georgia, and Elberta.

Farms including Greenville sandy loam range in price from \$75 to \$150 or higher an acre, according to the location and improvements.

For general farming or for special crops, such as vegetables, melons, fruit, and pecans, the Greenville sandy loam is one of the best in the county. For the maintenance of soil fertility the frequent use of legumes in the rotation for hay and green manuring is recommended. Alfalfa has been successfully produced on this soil in other counties in Georgia.

#### HOFFMAN SANDY LOAM

The surface soil of the Hoffman sandy loam consists of grayish-yellow or gray loamy sand or light sandy loam, 6 to 10 inches deep, underlain by a brownish-yellow or yellow, brittle, sandy subsurface layer slightly mottled with red and gray. The subsoil below 16 to 20 inches is an intensely mottled purple, yellow, red, and white, brittle, somewhat indurated sandy clay. The surface layer is very unevenly distributed and varies from a few inches to 18 to 24 inches in depth, depending upon the topography. Small areas of deep sand are included in the vicinity of the sand hills.

The substratum as exposed in deep road cuts shows layers of highly colored, indurated sandy clay, with lenses or pockets of kaolin, sands, and varicolored clay. In the southeastern part of the county, on the slopes of the high hills along the Twiggs County line, fragments of pale-green and yellow, partly weathered sand rocks, which in places are high in fossils, are strewn over the surface, and in a number of places these rocks outcrop just below the brow of the hill. Near the junction of the Coastal Plain and Piedmont provinces this type is more or less mixed with Wilkes material and has a somewhat plastic lower subsoil.

This type is characterized by galled and eroded spots and knolls where the highly colored subsoil is exposed. It has a surface varying from gentle slopes, such as near Sofkee, to the precipitous gullied hillsides near Brown Mountain and south of Franklinton. In spots the material is somewhat gravelly, such areas being shown on the map by gravel symbols. Much of the type is so badly eroded and gullied as to be practically worthless. The type generally occurs on slopes, with Norfolk, Ruston, and Greenville soils on the ridges and uplands, and is distributed throughout the eastern and southern parts of the county. It occupies many of the hillsides in the vicinity of Macon. The largest areas are in the sand hills, in the vicinity of Sofkee, and on the slopes above Stone and Swift Creeks in the eastern part of the county.

The Hoffman sandy loam erodes rapidly upon being cleared and put into cultivation. About 65 per cent of it has been cleared at one time or another and cropped, but after a few years' cultivation it has been allowed to lie out for pasture or permitted to grow up in pine, sassafras, scrub oak, gum, fennel, and briers. Most of the merchantable timber has been removed. About 20 per cent of the land is now in cultivation. Cotton and corn are the principal crops, cotton yielding one-eighth to one-sixteenth bale per acre and corn 10 to 12 bushels. In the eastern part of the county the beds of kaolin and clay which underlie this soil are being mined for use in the manufacture of high-grade pottery.

Terracing the slopes to prevent erosion is necessary immediately upon clearing this type. The soil suffers more quickly from variation in moisture conditions than the other sandy soils, and liberal additions of organic matter would increase its moisture-holding capacity. Except for the areas which have somewhat smooth topography, this type is best suited to forestry and grazing.

#### GRADY CLAY LOAM

The surface soil of the Grady clay loam varies from a dark-gray to almost black clay loam or heavy silt loam 3 to 6 inches deep, underlain by a subsoil of gray or steel-gray, sticky, plastic clay, with some yellow or rusty-brown mottlings in the lower subsoil.

This type occurs only in small flat depressions, sinks, or ponds in the Greenville and Norfolk soils distributed over the southern part of the county. These areas are most numerous west of Walden. Around the edges of the sinks some Grady sandy loam is included. During wet spells water stands on this soil and on uncleared areas water remains throughout the winter.

Most of these ponds have been cleared of their growth of cypress, gum, water oak, some pine, cane, and gallberry, and after drainage

have been used for pasture or put under cultivation. They are drained either by cutting surface ditches through the neighboring rim of higher land into a natural drainage way, with laterals to the various parts of the pond, or by a well shaft sunk in its lowest part into the more or less porous limestone substratum, which usually permits the excess water to drain into an underground channel. After thorough drainage this land is productive and well adapted to corn, cane, hay, or pasture. Crab grass produces some hay and pasturage.

#### KALMIA SANDY LOAM

The surface soil of the Kalmia sandy loam in virgin or old-field areas is a grayish-brown to light-brown loamy sand to a depth of 2 to 4 inches, where it grades into a pale-yellow loamy sand, which extends to depths of 14 to 18 inches. The subsoil to a depth of 30 to 40 inches is a yellow sandy clay of a friable, crumbly structure. Below this is a mottled purplish-red, yellow, and whitish, very friable sandy clay containing a few soft iron accretions. Under cultivation the upper layers of the loamy sand are mixed to a depth of about 6 inches, thus producing a light-gray to brownish-gray color.

This soil closely resembles the Norfolk sandy loam of the uplands, from which it is largely derived. Near Hartley Bridges it includes small areas of Kalmia sand. In low spots next to slopes, where drainage is imperfect, the soil and subsoil are gray or mottled gray and yellow. Such areas, if more extensive, would have been separated as Myatt sandy loam. In places the type includes small areas of Augusta sandy loam and Wickham sandy loam.

The Kalmia sandy loam is flat, sloping, or slightly undulating, and is usually well drained. It occurs on terraces or second bottoms in widely scattered areas along the larger creeks and particularly at points of juncture between two streams. The largest areas are southeast of Macon, east of Rutland, southeast of Avondale, and along Echeconnee, Swift, and Stone Creeks. Part of the down town section of Macon is built on Kalmia sandy loam.

About 80 per cent of the type has been cleared of the forest growth, which consisted principally of pine, oak, gum, and poplar. Corn and cotton are the principal crops, and yields range from 10 to 20 bushels of corn and one-eighth to one-half bale of cotton per acre. Sweet potatoes, cowpeas, peanuts, truck crops, and melons do well and are grown on this soil to some extent near Franklinton. The soil is easy to cultivate, and if properly handled it should be almost as productive as the Norfolk sandy loam of the uplands. South of Macon alfalfa is grown successfully on this soil, yielding 3 to 4 tons per acre in four or five cuttings. Some peach orchards are producing well, although the type is not so well suited to peaches as the upland soils, owing to the greater danger from frosts and the poorer air and water drainage. Several dairies are established on this type, and good Bermuda-grass and crab-grass pasture is available.

The Kalmia sandy loam can be improved by the addition of barnyard manure or the growing and plowing under of legumes. It needs fairly heavy applications of fertilizer high in potash for cotton production. It warms up early in the spring and is well adapted to the production of truck crops and melons.

## AUGUSTA SANDY LOAM

The Augusta sandy loam is a grayish-yellow or pale-yellow sandy loam or loamy sand, grading at 8 to 10 inches into a brownish-yellow or yellow friable sandy clay subsoil mottled with purplish-red and gray splotches. Below 20 to 24 inches the subsoil is a compact but friable sandy clay mottled yellow, red, and gray. It is a second-bottom soil developed on streams near the fall line, and it resembles the Hoffman sandy loam of the uplands. Included in this type are several variations, none of which are sufficiently large to warrant separation. Along the Echeconnee Creek near the Crawford County line and in places downstream, areas mapped as Augusta sandy loam represent a very mixed soil condition, the subsoil being a gray silty clay mottled with yellow and rusty brown, resembling the Roanoke sandy loam. Small areas of Kalmia and Wickham soils are also included.

This type is of small extent, the largest areas being mapped along the Echeconnee Creek between Hartley Bridges and Marshalls Mill, along the east side of the Ocmulgee River bottoms near Lakeside, and along the lower river road where it crosses into Twiggs County. Smaller areas occur along the Tobesofkee Creek near the road leading to Houston, south of Pine Forest Church, and along the lower course of Rocky Creek. The type occupies flat or undulating land on stream terraces. Owing to the compact structure of the subsoil the internal drainage is imperfect.

About half of the type is cultivated, the balance being allowed to remain in forest or pasture. The forested areas support an excellent growth of gum, willow, various oaks, persimmon, short-leaf pine, and alder. Excellent corn is produced in favorable years but in wet years it sometimes drowns out. The soil is not very well suited to cotton. One excellent truck garden is located on this soil where water for overhead irrigation is available. Owing to its imperfect drainage it is not so well adapted to trucking as many of the other upland and terrace soils and is late in warming up in the spring. It produces a fairly good pasture consisting of crab grass and some carpet grass.

By improving the internal drainage through deep plowing, ditches or tiling, and increasing the content of organic matter, this soil can be brought to a fairly high condition of fertility. It seems best adapted to corn, cane, and grass.

The following table gives the results of mechanical analyses of samples of the soil and upper and lower subsoil of the Augusta sandy loam:

*Mechanical analyses of Augusta sandy loam*

Number	Description	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
		<i>Per cent</i>						
257130	Soil, 0 to 8 inches	6.4	12.7	7.4	20.8	14.6	11.0	27.0
257131	Upper subsoil, 8 to 22 inches	9.8	15.5	6.4	19.7	9.4	10.4	28.8
257132	Lower subsoil, 22 to 36 inches	3.7	8.9	4.2	13.0	6.2	15.4	48.6

## WICKHAM SANDY LOAM

The surface soil of the Wickham sandy loam is a light-brown or brown loamy sand or medium to fine sandy loam, 6 to 8 inches deep, underlain by a reddish-brown friable sandy clay or heavy sandy loam subsoil, grading below 16 to 20 inches into a brownish-red, compact, gritty sandy clay. In places the subsoil below 6 to 10 inches is a uniform reddish-brown to dark-brown sandy loam. Small areas of Kalmia sandy loam are included with the type as mapped.

This type occurs on flat or gently sloping second bottoms along streams flowing out of the Piedmont Plateau and is well drained. The largest areas are along the Ocmulgee River near Holton, Macon, and east of Sofkee. Small areas occur near the mouth of Walnut Creek and distributed along the Tobesofkee and Echeconnee Creeks. The type is of small extent and little agricultural importance.

The Wickham sandy loam is used for corn, cotton, sugar cane, and pasture. Corn yields 15 to 25 bushels and cotton one-eighth to one-third bale per acre. This soil produces an excellent Bermuda-grass pasture. In the vicinity of Macon it is used to some extent for truck crops and melons and it is very well suited to such crops. Several fields are in alfalfa.

## CONGAREE FINE SANDY LOAM

The Congaree fine sandy loam consists of recent alluvium deposited by streams flowing from the Piedmont uplands. The surface soil consists of light-brown to slightly reddish brown loamy fine sand or fine sandy loam, 8 to 12 inches deep, underlain by a subsoil of rich-brown or reddish-brown silt loam, heavy fine sandy loam, or loam. Where the topography is wavy or billowy the texture is variable and the type includes small areas of loamy fine sand in the higher parts and silty clay loam in the depressions. Along the stream banks it includes areas of loose sand, some of which are variable and similar to Meadow. In places the soil contains a considerable quantity of fine mica particles.

This type is mapped principally along the Ocmulgee River from the mouth of Sabbath Creek to several miles below Macon. Smaller areas occur along Tobesofkee Creek northeast of Midway Church and south of Shiloh Church, and in the Echeconnee Creek bottoms below Marshalls Mill. In the wide and flat river bottoms below Macon it is found principally along the margin of the river. Where the type is in bends of the river it is frequently sanded during periods of high water, such bends being protected from washing by piling sunk in the river. South of Macon the bottom land in places is protected by levees which are maintained by the owners of contiguous land. The levees constructed along the Tobesofkee Creek have not been kept up. The topography is flat or very slightly wavy, with here and there slight depressions or sloughs representing old stream channels.

About 90 per cent of the type is cleared of its growth of oak, gum, maple, pine, mulberry, haw, and poplar. The fields are large and many of them are unfenced. Most of the type is used for hay and corn. The hay consists mainly of Johnson grass and Bermuda grass

and yields  $1\frac{1}{2}$  to  $2\frac{1}{2}$  tons per acre. A considerable amount of lespedeza, dallis grass, and switch cane grows throughout the type and furnishes excellent pasture for cattle and hogs. Pastures not cared for soon become covered with dog fennel, broom sedge, cocklebur, bear grass, and other weeds. Corn produces 30 to 60 bushels per acre without the use of fertilizer. The corn is gathered but the fodder is allowed to remain to be grazed off in the fall and winter and turned under in the spring. Occasionally high water in July destroys the crop. Oats are grown to some extent and produce 25 to 40 bushels per acre. Cowpeas make a rank growth but are badly infected with nematodes. The Iron and Brabham are the only varieties that are successfully grown in the bottoms. Some sugar cane is grown.

This type of land sells for prices ranging from \$40 to over \$100 an acre.

#### CONGAREE SILTY CLAY LOAM

The surface soil of the Congaree silty clay loam is a rich-brown friable silty clay loam 10 to 15 inches deep, underlain by a subsoil of brown or reddish-brown heavy silty clay. The subsoil is somewhat variable and in places it is a loamy fine sand or fine sandy loam. The surface soil in places is a silt loam or loam. Small areas of fine sandy loam along the stream margins, too small to show on the map, are included. Mica flakes are commonly found throughout the soil and subsoil and in places impart a distinctly greasy feel to the material. In low, poorly drained areas the subsoil has mottlings of gray or rusty brown. The material is of alluvial origin, and new deposits of alluvium are added during each inundation.

Much of this type is subject to overflow by every high water, and some of it is water-logged most of the year. This is true of most of the bottoms of Echeconnee Creek and much of the Tobesofkee Creek bottoms below the fall line. Only a small part of the type is cleared of its forest cover, although much of the best commercial timber has been removed. The forest growth consists mainly of gum, chestnut and other oaks, beech, hickory, birch, ash, and pine, while hackberry, willow, holly, magnolia, bay, and haw are common.

About 5 to 10 per cent of the type is farmed. It is a very strong soil and requires no fertilizers. Corn, oats, peas, cane, and hay are the main crops. Corn and oats yield 20 to 40 bushels. Hay, consisting of Johnson grass and Bermuda grass, yields 2 to  $2\frac{1}{2}$  tons per acre. The Johnson grass tends to produce a rather woody hay, but if cut before it becomes too ripe, or "in the boot" just as the head is emerging, the hay is more palatable and brings a better price. Much of the type is used for cattle and hog range. Acorns and nuts are abundant and furnish excellent mast for hogs, while switch cane along the sloughs, and lespedeza, broom sedge, and Bermuda grass in the open fields produce abundant pasturage for cattle.

Just below Macon the clay under much of this type is being excavated for use in the manufacture of brick. The numerous ponds or lakes shown on the map indicate where the soil has been removed, the clay taken out with steam shovels, and the excavations allowed to fill with water. Such places are ideal breeding places for mosquitoes and are a menace to health unless drained or oiled.

The Congaree silty clay loam is a productive soil and well suited to grain and hay production. Most of it could be cleared and farmed with profit if drainage ditches were dug, the stream channels widened and deepened, and levees constructed to protect crops against floods.

#### MEADOW

Meadow includes alluvial material so mixed and of such varied texture, structure, and color that it is impracticable to separate it into types. It includes areas of sand, sandy loam, and silty clay loam, and the colors range from gray to almost black. North of Mount Pleasant Church along the edge of the bottom adjacent to the sand hills it is a mucky loam to depths of 10 to 20 inches, with a dark-gray clay subsoil, and is wet and soggy. The material is both of Coastal Plain and Piedmont origin. It occupies the entire bottoms along Walnut, Swift, and Stone Creeks in the eastern part of the county, and is mapped in a large area just below Macon at the edge of the river bottoms, and in the Tobesofkee Creek bottom south of Shiloh Church.

Meadow is subject to frequent overflow and the texture of the material is subject to change with each flood. It is mainly in forest or brush, the cleared areas being used for pasture, with here and there a small field planted in corn. Meadow is best suited to pasture and forestry.

#### SUMMARY

Bibb County occupies approximately the geographical center of Georgia. It comprises 250 square miles or 160,000 acres. The fall line or boundary between the Piedmont Plateau and the Coastal Plain crosses the county.

The topographic features include rolling to hilly uplands, terraces, and bottoms that are narrow in the Piedmont section but widen out below the fall line. The uplands are well drained with the exception of some sinks in the southern part of the county, while the bottoms are subject to overflow, some of them remaining wet through most of the year. Considerable water power is developed on the Ocmulgee River above Macon, and some of the larger creeks are used to run mills and gins.

The population in 1920 was 71,304, the rural population comprising 25.7 per cent. Macon, the county seat, with a population in 1920 of 52,995, is an important manufacturing and railroad center. Excellent railroad transportation facilities are available. The county has a fine system of roads, many of them being hard surfaced, and an up-to-date system of consolidated schools.

The climate is mild, the winters being short and the summers long and warm, with a growing season of about 230 days and a grazing season of about 9 months. The average annual rainfall of about 45 inches is well distributed throughout the year.

Cotton and corn are the principal crops, although peach growing is becoming more important, and sweet potatoes and truck crops are extensively produced in the vicinity of Macon. Cotton occupied 38.4 per cent and corn 28.4 per cent of the improved land in 1919. Cotton averaged 0.27 bale per acre, and corn 11.3 bushels.

The principal peach orchards are located in the southern and western parts of the county, Walden, Avondale, Lizella, and Lorane being the principal shipping points. All of the fruit growers have some side lines, such as hogs, poultry, or truck. Peaches are grown on the Greenville, Orangeburg, and Norfolk soils in the southern part, and on the Cecil and Davidson soils in the northern part.

Truck crops, sweet potatoes, peanuts, melons, and cantaloupes are grown to a considerable extent on the sandy lands of the county. Several crops can be grown on the land during a season. Sugar cane is grown on most farms. Several large sweet potato storage houses are in use.

Hogs for production of pork for home needs are raised on practically all farms and a few cattle are grazed by most farmers.

There are two distinct classes of soils in Bibb County—the heavy red lands of the northern part, and the light sandy soils of the southern part.

The red lands are generally high in the elements of plant food, but require careful cultivation and handling in order to produce fair returns. These soils are well suited to the growing of corn, cowpeas, clovers, and grasses, and even to alfalfa and peaches.

The sandy soils, including the light-gray to red surface soils and yellow to red subsoils, are adapted to cotton, peanuts, cowpeas, velvet beans, melons, peaches, sweet potatoes, sugar cane, and truck crops.

Some of the bottom lands, especially the Congaree soils, are admirably suited for growing corn and hay. The rougher and more broken areas in all parts of the county, especially breaks near the larger streams, should be devoted to forestry or grazing.

Bibb County offers many advantages to the home seeker in the way of cheap lands, mild climate, good markets, excellent transportation facilities, and soils suitable for the growing of a large variety of crops for home consumption and local and distant markets. Peaches, pecans, peanuts, dairying, and poultry raising could be extended on a profitable basis.





Areas surveyed in Georgia, shown by shading

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