U. S. DEPARTMENT OF AGRICULTURE

BUREAU OF SOILS

SOIL SURVEY OF LEXINGTON COUNTY SOUTH CAROLINA

BY

W. J. LATIMER, IN CHARGE, CORNELIUS VAN DUYNE, W. E. McLENDON, AND W. I. WATKINS

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

WASHINGTON
GOVERNMENT PRINTING OFFICE
1925

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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 for the congressional district or districts in which the survey is made, and one thousand copies for the use of the Department of Agriculture.

Approved, March 14, 1904.

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

CONTENTS

ILLUSTRATIONS

FIGURE

MAP

SOIL SURVEY OF LEXINGTON COUNTY, SOUTH CAROLINA

By W. J. LATIMER, in Charge, CORNELIUS VAN DUYNE, W. E. McLENDON, and W. I. WATKINS

DESCRIPTION OF THE AREA

Lexington County, S. C., is located in the west-central part of the State, the eastern edge of the county touching Richland County at Columbia, the capital of South Carolina. The county has an extreme extent north and south of about 40 miles and east and west of about 30 miles. Planimeter measurements make the area 801 square miles,[1] or 512,640 acres.

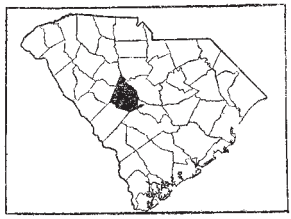

FIG. 5.—Sketch map showing location of the Lexington County area, South Carolina

The county lies partly in the Piedmont Plateau and partly in the Coastal Plain. The surface in general consists of two plains. The northern and lower plain lies north of the foot of the northward-facing escarpment extending along a line approximately connecting the towns of Batesburg, Lexington, and New Brookland. The northern plain is the lower, its southern border lying about 100 feet below the top of the southern plain marked by the line just described. Both plains slope southward, the southern sloping a little more rapidly than the northern. Both plains are dissected, the northern more thoroughly and completely than the southern. As a whole, therefore, the northern plain has a more hilly topography than the southern, the southern including considerable areas of smooth topography, while the northern contains small areas only of this kind. The northern plain is part of the Piedmont region and the southern is part of the Coastal Plain.

Narrow terraces and first bottoms lie along all the streams, except the Congaree River at the eastern edge of the county, where there is an area of terrace 6 miles long and about 2 miles wide. Alluvial lands lie along nearly all the streams in belts varying in width from 200 feet upon the smaller streams to one-half mile upon the larger.

There is a range in elevation within the county from about 120 feet above sea level, where the Congaree River leaves the county, about 8 miles below Columbia, Richland County, to a maximum of 665 feet or more in the neighborhood of Batesburg.

The drainage of the county is carried by four main streams, the Broad, Saluda, Congaree, and North Fork Edisto Rivers and their tributaries. The smaller streams and branches of these main streams

[1] Twenty-two square miles added to Newberry County, 1920; 14 square miles added to Richland County, 1922. These areas are included in survey of Lexington County.

reach all parts of the county. There is little poorly drained upland, and this is confined to small spots in the level divides. Belts along the creek bottoms are nearly always poorly drained.

The streams of the Piedmont region ramify all parts of the upland, so that practically every farm is supplied with water. In the Coastal Plain region streams are not as numerous and in the sand hills there are many farms that do not have running water.

Most of the streams have fairly rapid flow and many small mills are situated where they break from the general level of the upland to the larger streams. A number of water-power developments are situated upon the main streams at Parr Shoals on Broad River and at Columbia, the State capital, which is situated in Richland County opposite New Brookland on the Congaree River, and a number of undeveloped power sites exist upon the Saluda River.

Lexington County is a part of the original Lexington district laid out when the State was first formed into districts after the Revolutionary War. The county was formed from the district in 1868. Since that time a considerable area has been taken from the county at different times.[2]

The first settlements within the territory were made just prior to the outbreak of the Revolution. The early settlers were of three nationalities—Dutch or German immigrants, who settled mainly between the Broad and Saluda Rivers in the section which later became known as the Dutch Fork; English, who came in from the coast counties, and Scotch-Irish. Later another element, the negroes, were added. The present population is descended from these settlers. According to the United States census, the population of Lexington County in 1920 was 35,676, of which 23,948 are white and 11,728 negro. The rural population is 92.4 per cent of the total, and the density is 42.3 per square mile.

Batesburg, with a population of 2,848,[3] is the largest town. This and Leesville, population 1,216, form twin cities, their city limits being only one-fourth mile apart. Lexington, population 894, is the county seat; New Brookland, with a population 1,793, is situated across the Congaree River from Columbia. The other towns in the county have populations less than 800. The ridge through the central part of the county is the most thickly settled section and the sand-hill region south from Lexington the most sparsely settled area. The rest of the county has a fair distribution of inhabitants.

The county is well supplied with transportation facilities. The Southern Railway passes through the center of the county, and the Columbia & Savannah Branch of the same system extends southwest from Columbia. Two other branches of the Southern, the Greenville Branch and the Perry Branch, enter the county. The Seaboard Air Line passes from Cayce through the southeastern part and the Columbia, Newberry & Laurens Railroad passes through the northern part of the county. The Congaree River is navigated as far north as Cayce.

Nearly all the main wagon roads in the sand region are of the improved sand-clay type. Some main roads in the Piedmont region

[2] Parts annexed to Aiken County in 1871; Calhoun County in 1908; parts annexed to Richland County in 1913 and 1922; and parts annexed to Newberry County in 1901 and 1920.

[3] A small part of Batesburg is in Saluda County.

are of the "topsoil" type. The main surfaced roads are the Atlantic Highway from New Brookland to Batesburg, the Appalachian Highway from Hilton to Little Mountain in Newberry County, the State Highway from New Brookland to Swansea, the Swansea-Pelion Road, the Swansea-St. Matthews (Calhoun County) Road, the Batesburg-Pelion Road, the Lexington-Orangeburg (Orangeburg County) Road, and a number of shorter roads. The ordinary roads in the sand region are not improved and travel over them is difficult except in wet weather. In the clay region the roads are fairly good in summer but almost impassable in winter or wet weather.

Most of the rural sections are served by rural mail routes and telephone lines. Churches and schoolhouses are located at convenient points throughout the county.

Batesburg, Leesville, Lexington, New Brookland, and Swansea are the leading markets for farm produce in the county, and Columbia is the chief market outside the county. Cotton mills are located at Batesburg, Lexington, Red Bank, and New Brookland, and these, together with the Columbia mills, use all the cotton grown in the county. Oil mills at Batesburg, Leesville, Lexington, and Swansea use most of the cottonseed. Swansea has a large crate factory which draws its supply of lumber from the surrounding country. Nearly all the small towns have cotton gins, sawmills, and gristmills.

CLIMATE

The climate of Lexington County is characterized by short mild winters, long hot summers, and abundant rainfall. The mean annual temperature is 62.6° F. The average mean temperature for winter is 45.3° F. and for summer 78.8° F. The absolute minimum, recorded in February, is −4° F., and the absolute maximum, which occurred in July, 107° F.

The annual average precipitation of 50.42 inches is well distributed through the year. The average rainfall for the spring months is 11.08 inches and for the summer months 16.53 inches. The snowfall amounts to only a trace during most winters and only a few inches during the hardest winters.

The time elapsing between the average date of the last killing frost in spring and the average date of the first killing frost in fall is 7½ months, which is ample for the maturing of all the common crops and in the case of certain crops allows the use of the same field for a second crop the same season. The average date of the last killing frost in the spring is March 29 and of the earliest in the fall November 11. The latest recorded frost in the spring occurred on April 17 and the earliest in the fall, October 10.

In general the rainfall is so distributed that crops rarely suffer from lack of moisture, and though crops have a tendency to burn out during the heat of summer upon the sandier soils, these can be grown satisfactorily in the spring or fall.

The climate is favorable to a more extensive development of agriculture than exists. It is suited to general farming, stock raising, and the production of truck crops for the northern and local markets.

The table following gives the more important climatic data for the county, as compiled from the records of the Weather Bureau station at Batesburg.

Normal monthly, seasonal, and annual temperature and precipitation at Batesburg

(Elevation, 656 feet)

Month	Temperature			Precipitation		
	Mean	Absolute maximum	Absolute minimum	Mean	Total amount for the driest year (1905)	Total amount for the wettest year (1903)
	°F.	°F.	°F.	Inches	Inches	Inches
December	45.7	84	0	3.96	6.92	2.73
January	45.4	79	9	3.25	2.02	4.78
February	44.8	84	—4	5.88	4.63	11.10
Winter	45.3	84	—4	13.09	13.57	18.61
March	55.1	92	17	4.57	2.04	11.14
April	61.4	94	26	3.09	5.02	3.31
May	71.5	102	36	3.42	2.95	3.27
Spring	62.7	102	17	11.08	10.01	17.72
June	77.8	103	44	5.08	.47	8.63
July	80.0	107	55	5.43	4.93	3.06
August	78.7	105	54	6.02	4.68	7.80
Summer	78.8	107	44	16.53	10.08	19.49
September	73.9	99	39	3.89	.92	4.26
October	63.1	96	27	3.25	2.31	2.66
November	53.7	86	19	2.58	1.29	3.17
Fall	63.6	99	19	9.72	4.52	10.09
Year	62.6	107	—4	50.42	38.18	65.91

AGRICULTURE

The earliest permanent settlement in the territory now included in Lexington County took place along the banks of the larger streams, then the principal avenues of travel and commerce. The soils of the stream bottoms were the first used for agriculture. Development spread later to the terrace soils and to the heavier soils of the Piedmont section and some of the better of the Coastal Plains soils. The very sandy soils were the last to be brought under cultivation.

In the early days corn, small grains, and other subsistence crops were grown. These crops are still grown, but cotton, which began to be grown in commercial quantities about 1850, has had the greatest influence on the agricultural progress of the county.

The following table, compiled from the reports of the last five censuses, gives the acreage and production of the various crops of Lexington County in the years 1879, 1889, 1899, 1909, and 1919. The figures are not strictly comparable, for the area of the county has been reduced several times by the detaching of territory in forming other counties,[4] but they do show the general trend and the growth of agriculture in the 40-year period ending in 1920.

[4] According to the census the area of the county was 568,400 square miles in 1880 and 1890; 566,400 in 1900; 533,120 in 1910; and 498,560 in 1920.

Acreage and production of principal crops, 1880–1920

Crop	1919		1909		1899		1889		1879	
	Acres	*Bushels*	*Acres*	*Bushels*	*Acres*	*Bushels*	*Acres*	*Bushels*	*Acres*	*Bushels*
Corn	46,448	607,820	48,830	570,181	51,408	401,390	39,246	336,230	35,760	304,509
Oats	4,583	67,399	13,162	213,429	10,869	131,590	11,143	127,086	10,237	121,290
Wheat	9,055	68,156	3,609	22,955	11,397	56,920	7,078	34,954	12,155	48,167
Rye	431	4,044	213	810	233	750	130	494	70	194
Peas	5,329	29,622	13,808	31,936	4,829	37,806	-------	28,732	-------	37,204
Peanuts	99	2,157	326	6,981	296	5,818	56	1,056	-------	-------
		Tons		*Tons*		*Tons*		*Tons*		*Tons*
Tame hay	1,040	989	1,205	1,183	2,640	2,991	161	224	-------	-------
Wild hay	104	52	353	409	-------	-------	-------	-------	-------	-------
Grains cut green	5,396	3,199	6,388	5,540	2,181	2,163	-------	-------	-------	-------
Legumes	10,842	8,916	-------	-------	-------	-------	-------	-------	-------	-------
Coarse forage	17,019	4,185	301	151	90	92	-------	-------	-------	-------
		Bales		*Bales*		*Bales*		*Bales*		*Bales*
Cotton	54,262	29,468	46,337	24,790	32,904	13,637	32,761	12,760	22,871	9,050
		Pounds		*Pounds*		*Pounds*		*Pounds*		*Pounds*
Tobacco	121	61,549	-------	-------	16	16,000	-------	-------	-------	-------
		Bushels		*Bushels*		*Bushels*		*Bushels*		*Bushels*
Potatoes	314	17,472	263	20,340	178	7,231	43	2,656	-------	1,795
Sweet potatoes	1,938	165,461	1,676	154,686	1,374	88,903	1,185	59,449	1,671	62,557
	Trees		*Trees*		*Trees*		*Trees*		*Trees*	
Apples	22,764	10,424	38,493	8,817	47,628	11,416	29,665	39,314	-------	-------
Peaches	72,087	38,482	86,468	19,874	91,348	2,809	84,086	149,377	-------	-------

According to the census the total acreage in crops, excluding orchards, in 1879 was 82,764 acres, in 1889, 91,803, in 1899, 118,415, in 1909, 136,471, and in 1919, 156,981, or 14.6, 16.2, 20.9, 25.6, and 31.5 per cent, respectively, of the total area of the county in these years.

Lexington County is thus seen to be in a section of the country in which there has been a very notable and regular expansion of the cultivated crop area, the rate of increase in the various decades ranging from 10.9 in 1889 to 29.0 in 1899.

The growth in agricultural wealth produced in the county can not be measured so definitely for the whole period, for the earlier censuses give little data on this phase of the subject. The total value of agricultural products for 1909, however, is stated as $3,700,047 and for 1919, $9,925,136, the former including an item of $254,419 for "animals sold and slaughtered" which is not carried in the 1919 classification of products. The details making up the 1919 total are given in the table below:

Value of all agricultural products, by classes

Cereals	$1,484,946	Dairy products	$175,604
Other grains and seeds	126,309	Poultry and eggs	393,535
Hay and forage	529,737	Wool, mohair, and goat hair	200
Vegetables	810,850		
Fruits and nuts	149,500	Total	9,925,136
All other crops (including cotton)	6,254,455		

This table shows that the two chief sources of agricultural wealth in the county in 1919 were the production of the cereals (almost

entirely corn) and of cotton, which is the only important item in "all other crops." No other products have assumed great economic or commercial importance.

Cotton is to-day the main cash crop. It is grown in all parts of the county and upon all soils. As shown in the table on page 157, the acreage increased from 22,871 acres in 1879 to 54,262 acres in 1919. The production the latter year was 29,468 bales, and the estimated production, according to the census, in 1920 was 31,711. In the following year damage by the weevil became great, and the same authority gives the production as 7,783 bales, with 5,477 bales in 1922 and 14,626 in 1923. Just how the acreage has been affected, there are no authentic figures to show.

In 1919 the acreage of corn was nearly as large as that in cotton, but the increase in acreage between 1879 and 1919 was only about 30 per cent as compared with more than 100 per cent in the case of cotton. The production in 1919 was 607,820 bushels. Corn, as well as oats and rye, grown on small acreages, are produced chiefly as feed crops for farm animals and little of these grains finds its way to market. Some corn goes into meal for human consumption.

Wheat is grown for use as flour. The acreage has fluctuated widely during the period under consideration, being lowest in 1909, when there were less than 4,000 acres in this crop, and largest in 1879, when somewhat more than 12,000 acres were sown. The war period saw some increase in wheat growing, and in 1919 some 9,000 acres were devoted to the crop and a little more than 68,000 bushels harvested. From field observations it is estimated that the acreage of wheat, as well as of oats and rye, has greatly increased since 1920.

Among the minor crops are sweet potatoes, watermelons, peanuts, and tobacco. Potatoes and other vegetables are produced chiefly in home gardens. Other crops for home consumption are sorgo and sugar cane for sirup, strawberries, and raspberries.

Home orchards of summer apples, peaches, pears, and plums are found on many of the farms. The only orchard fruit grown commercially is the peach. Some small commercial orchards of this fruit have been set out on the ridge between Leesville and Lexington, and there are several large orchards around Edmund and Gaston. The Scuppernong is the most common variety of grape; most of the older farms have arbors of this grape. Some pecan groves are situated on the ridge in the vicinity of Batesburg, Leesville, and Lexington. The fruits produced are consumed in the county.

The relatively minor importance of animal husbandry in this county is reflected in the comparatively small area devoted to the hay and forage crops. There has been, however, a very considerable increase in the acreage of this class of crops in recent years, owing principally to the greater use of annual legumes and coarse forage crops. The value of all domestic animals in 1920 was $2,160,596, but of this the value of work animals, in greater part mules, constituted $1,371,572. The total number of beef cattle was only 1,281, of dairy cattle 7,729, of sheep and goats less than 1,000. Of food animals, hogs hold first place in numbers with a total of 21,469 head. The value of dairy products was $175,604, and of poultry products $393,535.

While the breeding and sale of farm animals is not of much commercial importance, it is in a small way a part of the farm practice throughout the county. All farms keep some livestock besides the work animals. On the average farm a few milk cows are kept, a half dozen or dozen hogs, and a flock of chickens. Beef cattle are raised principally on the farms along the streams, where they find pasture on the bottom land, and in the swamps. These cattle are fattened for market. A few dairies are situated in the neighborhood of Columbia, and many farms produce a small surplus of butter, which finds its way to this and the other towns of the county.

Little attention is paid to the question of the natural adaptation of the soils of the county to different crops. In a general way the sandy soils of the sand-hill section have been avoided up to this time by the farmers, and this is the least developed part of the county. In the Piedmont section, where the soils are relatively heavy, wheat and oats are more extensively grown than in the region of lighter soils to the south. The reverse is true of rye. The well-drained bottom soils, those derived from Piedmont material, are used largely for the production of corn. Since cotton is the money crop on all farms and covers a large acreage, little or no effort has been made to grow it on any particular group of soils. It is well known that the Marlboro sandy loam and Ruston sandy loam are good cotton soils and that the Norfolk sand is a poor cotton soil, yet cotton is grown indiscriminately on all these soils as well as on all the other upland soils.

The methods followed in handling the crops are much the same as over the rest of the State. Corn blades are stripped from the stalk while still green, cured in bundles, and used for feed; the ear is snapped later and stored in cribs. The shucking is done as the grain is needed or on rainy days. The cotton and corn stalks are broken down by hand on the small farms and with a stalk chopper on the large and better equipped farms. Wheat, oats, and rye are cut with reapers or cradled and stacked in the fields. Small grains are usually fed in the sheaf, but some of the wheat is threshed. Cowpeas are planted both for forage and for seed, usually between corn rows. The peas are picked by hand and threshed with a flail. When sown broadcast, the crop is usually cut for hay. The hay after curing is stacked in the field. Sweet potatoes usually are stored in pits, made by placing the roots in a pile and covering it first with pine needles or straw and then with earth. A few farms have built drying houses and are prepared to handle the crop on a large scale. Some watermelons are grown for the local market.

The main buildings on most of the plantations are of fairly good type and adequate for the kind of farming followed. On the large farms there is commonly a large barn for housing the work stock. On many, however, provision is not made for proper protection of farm machinery. The equipment of implements and machinery ranges from the common 1-horse plow with its assortment of attachments, a corn planter, spike-tooth harrow, plank drag, fertilizer distributer, cradle, hoes, and other hand tools on the poorer farm to those of the average farm which has all of these articles and in addition one or more 2-horse turning plows, a disk plow, a disk harrow, cotton-stalk chopper, grain drill, mowing machine, and reaper. Besides these

implements some of the better farms have a tractor and plows, harrows, and disks for use with it. A few farms have acquired in recent years machines for dusting cotton with arsenate of lead.

In planting cotton or corn, manure when available, or compost or pine needles is placed in a furrow before the bed is thrown up. Fertilizer is applied at the same time. Corn may be grown on a modified Williamson plan, applying half the fertilizer before planting and the rest subsequently in side dressings. Cowpeas are usually planted in the rows of corn at the last working or broadcast between the rows. For small grains the land is plowed in early fall, dragged, or disked and dragged. In most cases insufficient care is taken with the seed bed. The seed is sown either with a drill or broadcast by hand. Cowpeas often follow the small-grain crops, being cut for hay in late summer or fall. The land is then put in small grain again or left bare until the following spring. In some cases crimson clover is sown with grain as a nurse crop and either cut for hay after the grain is harvested or turned under with the stubble.

No definite crop rotations are followed. Cotton often follows cotton year after year for an indefinite period, or corn may follow corn in like manner. Sometimes, however, these crops are alternated. Where winter grains are grown it is a common practice to follow both by cowpeas. If these fields are not put in grain again in the fall, the land lies without protection during the winter and is planted to cotton or corn the next spring. This results in a form of rotation, but under the present system cotton and corn occupy so much larger acreages than the other crops that a standard and well-balanced rotation can not be followed.

In 1920, 91.3 per cent of the farms reported the use of commercial fertilizers, with a total expenditure of $1,057,309. This was largely of 8–2–2,[5] 8–3–3, and 8–4–4 grades. Only a small quantity of higher grade fertilizer was used. Unmixed fertilizer materials are used to a small extent. These include some kainit and slightly more cottonseed meal, but acid phosphate is rarely applied alone. Nitrate of soda is applied in spring as top-dressing on winter grains at the rate of 75 to 200 pounds per acre, and also in small quantities as a side dressing for corn.

Some farmers apply manure in growing corn; others prefer cottonseed meal. Mixed commercial fertilizers are applied chiefly for cotton at the rate of 250 to 1,000 pounds per acre. Usually part of this is added before planting or at time of planting and part to the growing crop. The same grade is used as for cotton, but the rate of application averages less than for cotton, ranging from 200 to 300 pounds per acre. The total quantity of fertilizer used on cotton in 1922 was much smaller than that for many years past, owing to the reduction of acreage being planted, caused chiefly by the boll weevil.

The farm laborers are negroes and native-born whites. The white labor is found chiefly in the sand-hill region; negroes are usually employed in other sections of the county. Much of the work on the farms is performed by the owners or renters and their families. This explains the relatively small amount expended for labor in 1919. In this year only 27.9 per cent of the farms reported the hire of labor,

[5] Percentages, respectively, of phosphoric acid, nitrogen, and potash.

with a total expenditure of $253,556, or approximately one-fourth the amount expended for fertilizer. The supply of labor, which has been small during the years since the war, is becoming nearly normal and promises to be as abundant as formerly. Under the conditions existing in 1922 many would-be renters were forced to work as laborers.

According to the census, the average size of the farms of Lexington County, in 1920, was 78.6 acres. The average holding is, however, larger than this, as the census considers each tenancy a farm. On the basis of individual ownership, most of the plantations contain from 300 to 600 acres, and the small farms range from 120 to 150 acres in size. Some of the sand-hill region is in large holdings. According to the 1920 census, there were 498,560 acres in farms in the county, 41 per cent of which was classed as improved land. The value of all farm property was $5,131,000. Of this the land represented 62.4 per cent; buildings, 21.5 per cent; implements, 6.7 per cent; and domestic animals, 9.4 per cent. The average assessed value of the land was given as $40.73 an acre. The selling price of land has declined sharply since 1919. Estimates of the extent of this decline range from 20 to 50 per cent.

In 1919, 53.6 per cent of the farms were operated by owners, 46.2 per cent by tenants, and 0.2 per cent by managers. At that time the terms of tenure were usually a stipulated amount of cotton, depending upon the productiveness of the land. In some cases the crops were divided equally between owner and renter, and, cotton being the leading crop, the burden of the rent fell upon this crop. With the advent of the boll weevil and the uncertainty of the cotton crop a radical change took place in the renting system. In most cases the contracts divide all crops equally when the owner furnishes half the fertilizer, whereas in other cases the owner furnishes nothing but the land and receives one-fourth the crops produced. From these general standards the provisions of the leases vary widely, depending upon ability of renter or owner to furnish teams, tools, seed, and fertilizer. No land rents for cash. Many farmers have ceased to rent any of their land and hire whatever labor is necessary to run the farm. It is recognized that more intelligent and closer supervision of farming operations are needed under weevil conditions than have been given formerly.

Under weevil conditions the system of farming followed for the last two or three decades has received a shock, but it is too soon to tell what the ultimate effect will be. Some adjustment probably will be necessary, and, as in other sections to which the weevil has spread, greater diversification of crops may be expected. Other crops may have to be introduced to take the place of cotton as a money crop. If this becomes necessary, as it seems from the present outlook, a careful study of soil adaptation should be made and such crops introduced as are best adapted to the various soils, with due regard to marketing facilities and other economic conditions. So far as the soils and climate are concerned, the Batesburg-Leesville section, extending halfway to Lexington and to Pelion on the south, might be developed as a tobacco district; the region south from Lexington could be devoted to commercial peach orcharding, and, along the ridges, to potatoes and sweet potatoes; the vicinity of Swansea, and north to Gaston, to

the growing of truck crops for the northern markets; and the northern part of the county to general farming, stock raising, dairying, and poultry raising.

SOILS

The soils of Lexington County are prevailingly light in color, ranging from light gray or gray to light brown, with a relatively small area reddish brown to red and a still smaller area dark gray to black. Nearly all these soils are deficient in organic matter, for this was a forested region, and soils developing under forest cover are uniformly low in organic matter and as a result light in color. Another factor tending to low organic-matter content and light color operative in the southern two-thirds of the county is the prevailing light texture of the soil and, over very considerable areas, subsoil. Such a texture favors the oxidation of such organic matter as may reach the soil and thus prevents accumulation of this constituent from year to year. Even in the northern third of the county, however, where the soils are prevailingly heavy, the soils, when looked at in a general way, are but little if any darker than the soils of the southern section. Of course, in virgin forest areas there may be and usually is a thin layer of leaf mold at the surface, but the material immediately below this layer is light yellow or gray and contains little humus.

Another general characteristic of the soils of this county is the absence of carbonates, the soil-forming process tending to the removal of these and other soluble salts rather than to their accumulation. Practically all the soils are therefore more or less acid. The absence of carbonates in the soils of this area is due to the leaching effect of the relatively heavy rainfall—the mean annual precipitation is about 50 inches—taken in connection with the generally open and porous soil material.

In chemical composition the soils of Lexington County are quite similar to those of the other "fall-line" counties, i. e., counties in which Coastal Plain overlaps the Piedmont region. In the sandier soils, where leaching has been most active, the content of alkaline earths and organic matter is very small, and experience has shown that all crops grown on these soils give a ready response to the application of fertilizers. Analyses[6] of Coastal Plain and Piedmont soils in other sections show that the Norfolk coarse sand and sand have a lime content varying from 0.16 to 0.27 per cent in the surface soil and from 0.07 to 0.38 per cent in the subsoil, and a potash content ranging from 0.08 to 0.45 per cent in the soil and 0.09 to 0.46 per cent in the subsoil. The Kalmia sandy loam and Hoffman coarse sandy loam have about the same content of these elements as the Norfolk sand. The Georgeville silt loam has a lime content of 0.16 per cent in the surface soil and 0.10 per cent in the subsoil, and a potash content of 1.62 per cent in the soil and 2.03 per cent in the subsoil. The Alamance silt loam has a lime content of 0.31 per cent in surface soil and 0.17 per cent in the subsoil, and a potash content of 0.60 per cent in the surface, and 1 per cent in the subsoil. These percentages are somewhat lower than those of soils in certain other parts of the United States, especially where, on account of cold winters, the ground is frozen and leaching prevented during several months

[6] Results of chemical analyses taken from Report on Soil Analysis, N. C. Agr. Dept.

of the year, and also in those parts where the rainfall is much lower than in this section.

The following pages of this chapter will be devoted to a discussion of the relation of the soils to the materials from which they have been derived, of their grouping in series, and their extent and distribution in the county.

That part of the county lying south of a line running approximately through Batesburg, Lexington, and New Brookland lies in what is known as the Coastal Plain, a region of unconsolidated sand and clay rocks producing a sandy soil, whereas that part of the county north of this line lies within what is known as the Piedmont region, an area of crystalline rocks. It is also known locally as the "clay section," "red-hill region," or "slate region." The part included in the Coastal Plain is called locally the "sand hills," the "sand country," or the "big sands." The materials of the Coastal Plain overlap the Piedmont Plateau rocks, and there are a few outliers of the latter in the Coastal Plain where streams have removed some of the geologically more recent deposits. In a few places south of Batesburg and Leesville the streams flowing to the south also have cut down into the Piedmont rocks. Again, on a few of the higher ridges in the vicinity of Lexington the Piedmont rocks are capped with Coastal Plain material. The line dividing the two provinces is, however, definite.

The Piedmont Plateau here shows two distinct classes of rocks, a crystalline, granitic group and a metamorphic slate group. The former occupies country north of a line from Little Mountain, Newberry County, to the Broad River, just north of Wateree Creek, and also a belt just north of the sand plains, from a point on the Saluda County line 3 miles north of Batesburg to the Saluda River near the mouth of Beaverdam Creek, crossing the river and taking in the hills in the bend, and back to the river just north of Steel Bridge, thence down the river to a point near Drehers Ferry, and thence south to Lexington. The granitic belt contains a fine-grained blue granite, a coarse-grained gray granite, and a dark-gray schist. The last occurs in a belt north of Little Mountain and south of Peak. The granitic soils are formed by the weathering of these rocks in place, and are relatively high in mica. They are of the Cecil and Appling series. The slate rocks, consisting of formations grouped as Carolina slates, outcrop in a broad belt in the Saluda basin between the schist belt on the north and the granitic belt on the south. The rocks consist of gray to dark-gray slates, of fine texture, cut by quartz veins, and carrying considerable talc. They give rise to soils of the Georgeville, Alamance, and Conowingo series.

Where the Coastal Plain overlaps the slate belt, as it does in a few places, noticeably east of Lexington and south of Batesburg, soils of the Bradley and Chesterfield series are developed. These have soils derived from Coastal Plain materials and subsoils influenced by material coming from slate. In the former the subsoil resembles that of the Georgeville types and in the latter the subsoil of the Alamance.

The materials from which the soils of the Coastal Plain section of the county have been formed consist of beds of unconsolidated sand, clay, sandy clay, and gravel. Through the changes incident to weathering and erosion the original materials have developed differences that give soils of the Norfolk, Marlboro, Ruston, Orangeburg,

Hoffman, and Portsmouth series. This region may be divided into two parts, according to the character of the substratum. North of a line through Steedman, Pelion, and Gaston the substratum is hard and brittle in structure, and pink mottled with red, yellow, gray, and white in color. To the south of the line the substratum is more friable, better aerated, yellowish red to red in color, though slightly mottled in places. This difference is due both to differences in the original material and to differences in the stage of oxidation. Aeration is better and oxidation further advanced in the southern area. The Coastal Plain soils are also divided into two groups from the standpoint of texture of the soil section. Over the great central area, inclosed by a circle from Cayce to Lexington, Gilbert, Summit, Pelion, Gaston, and the edge of the Congaree River terraces, the sand soils are developed; that is, the soils having 3 feet or more of sand. Outside of this, spread in a wide fan-shaped belt, are the sandy loam soils, having a sandy or loamy surface soil and sandy clay or loam subsoil.

The terraces or second-bottom and first-bottom or overflow soils have been formed from material brought down from the surrounding upland or from the drainage basins of the larger streams that head outside of the county, reworked by the streams, and deposited in their flood plains, old and recent. The terraces represent old flood plains now lying above overflow and the first bottoms the present overflow plains of the streams. The bottom-land soils differ according to the material from which they are derived, and these differences are described under the series.

The soils of Lexington County are grouped into series on the basis of color, origin, and structure of the component materials. The series are composed of types separated on the basis of texture or the proportions of sand, silt, and clay entering into their composition. Twenty-one series, including a total of 33 soil types, 2 with phases, besides the miscellaneous type Meadow, are mapped in Lexington County.

The gray, grayish-brown, reddish-brown or red upland Piedmont types with red, stiff, moderately compact subsoils are correlated in the Cecil soils. They are derived from granite, schist, and other crystalline or metamorphosed rocks, in places including narrow dikes of diabase. In general these soils are deeply weathered, the bedrock appearing only as detached bowlders, chiefly granitic. Fragments of white quartz are commonly present in areas derived from schist. Particles of finely divided mica are characteristic of the subsoil of this series. Three types of the Cecil series are mapped in this county, the gravelly fine sandy loam, fine sandy loam, and clay loam.

The soils of the Appling series are characterized by gray surface soils and a yellow friable but compact, granular subsoil, mottled or streaked with red. They are derived mainly from granite. While the soil is well drained, oxidation has not advanced as far as in the Cecil soils. Bowlders of granite are scattered over the surface. The topography is fairly level to undulating to rolling, becoming broken along the stream, but is generally smoother than the Cecil. The sandy loam and fine sandy loam types are mapped.

The Georgeville series includes types with gray to brown or red soils and a red, moderately compact, friable to brittle silty clay subsoil. The soils are closely related to the Alamance, both being devel-

oped upon the Carolina slate formation. That the Georgeville soils are red while the Alamance are gray and yellow may be due either to the higher iron content of the rocks beneath the Georgeville or to drainage conditions more favorable to oxidation, or to both combined. The parent slate in its unweathered state has a gray or bluish-gray color. Over most of these soils the weathering is fairly deep, the slate being exposed only along erosions or in ditch bottoms. Platy slate fragments are common in spots, and angular quartz fragments are scattered over the surface in places. The silt loam and silty clay loam are mapped.

The types of the Alamance series have gray surface soils and a yellow, slightly compact but friable silty clay loam to silty clay subsoil. This series is derived from the fine-grained Carolina slates. Platy fragments of slate and quartz fragments are common upon knolls. The formation is deeply weathered in places, but in many areas the partly disintegrated slate comes within the 3-foot soil profile. Two types, the silt loam and very fine sandy loam, are mapped.

The Conowingo series has gray, yellowish-brown, or whitish surface soils. The upper subsoil is yellow and friable, and the lower subsoil is a brownish-yellow, greenish-yellow, or drab sticky, waxy, impervious clay. The partly disintegrated parent slate commonly appears within the 3-foot soil profile. Iron concretions are abundant on the surface. The silt loam is the only type of the series mapped in this area.

The soils of the Bradley series have gray to brownish surface soils and a red subsoil, while those of the Chesterfield have gray surface soils and a yellow subsoil. Both series include types whose surface soils are derived from unconsolidated Coastal Plain deposits and whose subsoils are residual from slate. The subsoil of the Bradley is like that of the Georgeville and the subsoil of the Chesterfield like that of the Alamance. The Bradley gravelly fine sandy loam and the Chesterfield gravelly fine sandy loam are the types representing these series in this area.

The types of the Norfolk series have gray or yellowish-gray to yellowish-brown surface soils and a friable yellow sandy clay or sand subsoil. The substratum varies from yellow to yellow mottled with pink, red, and gray, or white to yellowish red, mottled with yellow. The Norfolk sand with a sand-hill phase, coarse sand, coarse sandy loam, and sandy loam are developed in this county.

The types included in the Marlboro series are closely related to those of the Norfolk series. They have yellowish-brown or grayish-brown shallow surface soils and a yellow to yellowish-brown friable but slightly sticky sandy clay subsoil, which may in places be mottled with red in the lower part. Yellowish-brown iron concretions are abundant on the surface and scattered through the soil profile. The sandy loam is the only soil type of this series mapped in this county.

The Ruston soils have gray to brown surface soils and a yellowish-red friable sandy clay or sand subsoil. They also contain iron concretions in places. These soils are intermediate in color between the Norfolk and Orangeburg soils, i. e., have reached a state of oxidation more complete than those of the Orangeburg and less complete than

that of the Norfolk. The Ruston sandy loam with a rolling phase and the loamy sand are the only soils of this series mapped in Lexington County.

The surface soils of the types included in the Orangeburg series are marked by their gray to reddish-brown color and open structure. The subsoil is a red friable sandy clay. The sandy loam is the only type mapped in Lexington County.

The surface soils of the types grouped in the Hoffman series are light gray to yellowish gray and the subsoil is a pink, mottled with red, yellow, brown, gray, and white, compact sandy clay to smooth clay containing little grit. The subsoil contains material closely resembling pipe clay or kaolin. The Hoffman soils represent the basal formations of the sand-hill region and occur on the lower slopes of that region. The Hoffman coarse sandy loam is the only type mapped in this county.

The types of the Portsmouth series have dark-gray to almost black soils, with a gray mottled with yellow and rusty-brown sticky sandy clay subsoil. The sandy loam is the only type of this series appearing in the present survey.

The types included in the Wickham series have gray to grayish-brown, brown, or reddish-brown surface soils and a yellowish-red or reddish-brown or red friable subsoil. These are terrace soils derived from Piedmont material. This series is represented by the fine sandy loam type.

The Altavista series also includes terrace soils derived from Piedmont material. These types have gray to yellowish-gray surface soils and a yellow friable subsoil. The fine sandy loam is mapped in Lexington County.

The surface soils of the types in the Kalmia series are gray to yellowish gray with a yellow or mottled yellow, faint red, or gray subsoil, the gray appearing at lower depths. The soil is derived from reworked Coastal Plain material laid down on second bottoms, or terraces. Only one type, the sandy loam, is mapped in this county.

The types of the Myatt series have dark-gray surface soils and a gray mottled with yellow, brown, and drab, sticky sandy clay subsoil. They occur as low terraces that have been subjected to poor drainage conditions. The material has been derived from Coastal Plain soils. The sandy loam of this series appears in the present survey.

The Augusta soils represent a terrace series that is derived from Coastal Plain material (Hoffman predominating). The soils are gray to dark gray and the subsoil mottled yellow, pink, red, reddish-brown, gray, and even white, plastic, heavy sandy clay. The sandy loam is the only type mapped in Lexington County.

The soils of the Congaree series have brown to reddish-brown soils and a yellowish-brown to brown subsoil, there being little change in texture and structure within the 3-foot profile. In places the deep subsoil is mottled with gray or drab. The soils are first-bottom or overflow types, lying along the streams that receive most or all of their sediments from the Piedmont Plateau where the Cecil soils predominate. The fine sand, fine sandy loam, silt loam, and silty clay loam are mapped.

The types of the Wehadkee series have gray or grayish-brown surface soils and a yellow, or yellow mottled with drab and brown, fairly heavy subsoil. These are first-bottom soils developed along

the streams in the slate region. They are subject to overflow and are poorly drained. The silt loam is the only type of the series appearing in this survey.

The types of the Johnston series have dark-gray to black surface soils and a gray to mottled drab, yellow, and brown subsoil. They occur in first bottoms in the Coastal Plain region and are in a swampy condition. The Johnston loam is developed in this county.

Meadow is a term used to cover bottom land that is derived from Piedmont and Coastal Plain soils and in which the texture is so variable that a type distinction in impracticable. It is subject to overflow.

The following table gives the names and the actual and relative extent of the several soil types mapped in the county; their distribution is shown on the accompanying map.

Areas of different soils

Soil	Acres	Per cent	Soil	Acres	Per cent
Norfolk sand	113,536	38.4	Chesterfield gravelly fine sandy loam	3,648	0.7
Sand-hill phase	82,816		Marlboro sandy loam	3,392	.7
Norfolk coarse sand	36,992	7.2	Kalmia sandy loam	2,880	.6
Georgeville silt loam	35,264	6.9	Ruston loamy sand	2,880	.6
Ruston sandy loam	4,864	5.3	Conowingo silt loam	2,816	.5
Rolling phase	22,528		Augusta sandy loam	2,368	.5
Georgeville silty clay loam	27,264	5.3	Congaree silty clay loam	2,240	.4
Alamance silt loam	23,744	4.6	Congaree fine sandy loam	2,112	.4
Norfolk sandy loam	22,848	4.5	Orangeburg sandy loam	1,728	.3
Hoffman coarse sandy loam	17,792	3.5	Myatt sandy loam	1,728	.3
Cecil clay loam	16,064	3.1	Bradley gravelly fine sandy loam	1,536	.3
Norfolk coarse sandy loam	15,616	3.0	Wickham fine sandy loam	832	.2
Cecil fine sandy loam	13,184	2.6	Altavista fine sandy loam	768	.1
Johnston loam	13,120	2.6	Meadow	640	.1
Cecil gravelly fine sandy loam	9,792	1.9	Congaree fine sand	576	.1
Appling fine sandy loam	7,104	1.4	Portsmouth sandy loam	256	.1
Congaree silt loam	6,400	1.2			
Alamance very fine sandy loam	4,864	.9	Total	512,640	
Appling sandy loam	4,416	.9			
Wehadkee silt loam	4,092	.8			

CECIL GRAVELLY FINE SANDY LOAM

The soil of the Cecil gravelly fine sandy loam is a light-brown or light yellowish gray, rather mellow loamy fine sand, passing at 6 to 10 inches into compact but brittle red fine sandy clay or clay. The gravel, which consists of quartz fragments ranging from 1 inch to several inches in diameter, is practically confined to the surface soil. In some places the surface is entirely covered with gravel and in others there is only a scattering. In a few areas the sandy layer has a thickness of only a few inches or is entirely absent, the red clay subsoil being exposed at the surface. This soil is derived from schist or similar metamorphic rock in which there are numerous veins of quartz which, being harder, has resisted weathering and remains in the form of gravel. The other parent rock material is more deeply weathered, rarely being encountered within the 3-foot profile.

The Cecil gravelly fine sandy loam occupies a belt of country, about 3 miles wide, extending across the northern part of the county, just north of the slate belt. The type occupies rather smooth-topped ridges which become somewhat broken and hilly toward the Broad River edge. The run-off is rapid, affording good drainage throughout the type. Notwithstanding the rapid run-off, erosion is not active owing to the protection afforded by the gravel.

The Cecil gravelly fine sandy loam is not extensive and not extremely important in the agriculture of the county. It is fairly productive, but owing to the large area that is broken or hilly there is only a small part, probably 20 per cent, under cultivation. The uncleared areas are forested with short-leaf pine and a scattering of hardwoods, mainly white and red oak. In many fields the larger stones have been removed. Cotton, corn, wheat, and oats are the main crops. Cowpeas, crimson clover, vetch, bur clover, sorgo, and sweet potatoes occupy small patches. Small orchards and gardens are found on nearly every farm. Some cattle and hogs are pastured in the woodland.

The soil is fairly productive. Cotton, when not attacked by the weevil, yields one-half to 1 bale per acre, and corn, wheat, oats, and crimson clover all give good yields.

Where the large stones have been removed this soil is easily plowed, and disk harrows and cultivators can be used to advantage. Spring-tooth harrows must be used in the stony or more gravelly areas. Little attention is given to soil improvement. Commercial fertilizers are relied upon to maintain the yields. They are applied at the rate of 200 to 700 pounds per acre of 8–3–3 grade on cotton, and in smaller quantities on corn. Practically no fertilizer is used upon other crops. Little attention is given to the maintenance of the supply of organic matter in the soil by green manuring. The supply of animal manures is entirely inadequate.

The Cecil gravelly fine sandy loam is adapted to a wide range of forage and grain crops, and for this reason should be devoted, at least in part, to stock raising and dairying. Tobacco should do well upon this soil. Both potatoes and sweet potatoes should give good returns upon this character of land, and peaches should thrive even upon the extremely gravelly areas.

CECIL FINE SANDY LOAM

In forested areas the soil of the Cecil fine sandy loam to a depth of 3 or 4 inches is a yellowish-brown loamy fine sand, passing into a mellow fine sandy loam of a yellowish-red or yellow, faintly tinged with red, mellow fine sandy loam. In cultivated fields the soil is a light-brown or yellowish-brown fine sandy loam. The subsoil, encountered at 7 to 10 inches below the surface, consists of a rather compact but brittle red clay. Weathering is moderately deep, the parent rock, a fine-grained granite, being exposed only as isolated bowlders representing the harder, more resistant parts of the rock formation. These bowlders do not occur in sufficient numbers seriously to interfere with cultivation of a field. In places the soil is quite gritty, approaching a sandy loam in texture. In cleared fields the depth of the surface soil is variable and many spots of raw red clay occur where the sandy mantle has been removed by erosion. This gives the fields a spotted appearance.

The Cecil fine sandy loam is found in irregular shaped areas over a belt several miles wide extending from about 2 miles north of Leesville to the Saluda River near Hope Ferry and in a few detached areas near Lattakoo and along the Saluda River northwest of New Brookland. The last carry a noticeable quantity of medium and coarse sand, being derived from a coarser grained granite. The to-

pography is undulating to rolling, affording excellent drainage. In places erosion is quite active, but over most of the type causes little serious damage.

This type, though not extensive, is fairly important. From 40 to 50 per cent is cleared and cropped, the rest being largely in forest of second-growth pine. The original forest was a sturdy hardwood growth, in which oak and hickory predominated.

Cotton, corn, wheat, and oats are the leading crops. Rye, cowpeas, vetch, crimson clover, sorgo (forage and sirup), and sweet potatoes are the minor crops.

Where handled properly, land of this type is quite productive. Cotton formerly yielded one-half to 1 bale per acre. Corn yields 15 to 35 bushels per acre, oats from 15 to 30 bushels with an average of about 20 bushels, and wheat 10 to 20 bushels with an average of about 15 bushels. Cowpeas and crab grass give from 1 to 1½ tons of hay per acre, and sorgo and cowpeas a much larger yield.

Shallow plowing is the rule, in order that the clay substratum may be disturbed as little as possible. Only in rare cases is a sod or cover crop turned under to maintain the supply of organic matter, and manure is used only on selected patches of land, the supply being entirely inadequate to cover the fields even taking them in rotation. The soil is therefore deficient in organic matter, and for this reason the average yields are lower than might be expected from a soil that is naturally strong.

Commercial fertilizer is used in small quantities for cotton and corn, and nitrate of soda as top-dressing on small grains in the spring. Deeper plowing, the more thorough preparation of seed bed for small grains, and the turning under of green manure crops and animal manures are steps needed to improve this soil. Cowpeas, vetch, and crimson clover should be grown in the rotations. Sorgo and cowpeas give the best returns of rough forage, and oats and vetch make a good hay combination on this soil. The type is fairly well suited to the growing of bright tobacco, potatoes, and small grains, and these crops should receive more attention. It is also suited to stock raising and dairying.

The following table gives the results of mechanical analyses of samples of the soil, subsurface, and subsoil of the Cecil fine sandy loam:

Mechanical analyses of Cecil fine sandy loam

Number	Description	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
		Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
243239	Soil, 0 to 3 inches	2.5	5.8	5.6	37.2	25.3	17.6	6.1
243240	Subsurface, 3 to 7 inches	1.2	4.4	4.6	32.6	19.7	22.0	15.6
243241	Subsoil, 7 to 36 inches	.4	3.4	2.6	14.7	9.2	22.1	47.6

CECIL CLAY LOAM

The soil of the Cecil clay loam in forested areas is a dark-red to dark reddish brown mellow clay loam passing at 4 to 6 inches into a red stiff brittle clay, extending to a depth of 3 feet or more. Where cleared, and especially after several years' cultivation, the soil is a red clay loam, 3 to 5 inches deep, underlain by the typical red clay

subsoil. The soil has developed through the weathering in place of granite, schist, and other igneous or metamorphic igneous rocks. These rocks are deeply weathered, to depths of 40 or 50 feet in many places, and nowhere does the bedrock appear at the surface. Small bowlders and other unweathered fragments of the rock are scattered upon the surface or embedded in the soil material in some places, but this condition is not general over the type. In many places small dikes of diabasic rock cut through the formation, giving rise to a dark-red soil with a maroon-red subsoil. These areas represent the Davidson clay loam, which on account of its small total extent is not mapped as a separate type.

The surface of the Cecil clay loam is fairly smooth to rolling and hilly, with smoothly sloping hillsides. In a number of places erosion has been active enough to cause gullying. The drainage is well established, most of the rain water passing off through the large number of intermittent drainage ways that traverse the surface of the type.

The Cecil clay loam is confined chiefly to two large areas, one in the northern corner of the county, where it covers most of the upland north of Peak, and the other south of the Saluda River at Steel Bridge. A few smaller areas are scattered throughout the crystalline belt that lies between the slate belt and the northern edge of the Coastal Plain.

This is one of the important Piedmont soils and from 40 to 50 per cent of it is cleared and used for farming. The rest is in forest composed largely of second-growth shortleaf pine, with a scattering of hardwood trees, such as white oak, hickory, sweetgum, cedar, dogwood, water oak, locust, and ash.

Cotton has been the principal crop in the past and probably occupies an acreage larger than any other crop at the present time, after an estimated reduction of 40 to 50 per cent of the area, caused by the boll weevil. Corn, oats, wheat, and cowpeas are the crops next in importance. Small areas of sorgo, vetch, and bur clover are grown. Cotton, before the advent of the weevil, ordinarily yielded one-half to 1 bale per acre, but under weevil conditions the returns are much smaller. Corn yields 20 to 40 bushels per acre, depending upon the season and condition of the individual field; wheat, 10 to 20 bushels; and oats, 15 to 40 bushels. Cowpeas and crab grass will cut 1 to 2 tons of hay per acre and clover gives fairly good stands and yields. Little livestock except work animals is kept.

Some of this land is terraced, and most of these terraces are kept in good repair. This is an important first step in the maintenance of productiveness. Commercial fertilizer is used on cotton, the ordinary applications ranging from 200 to 400 pounds per acre of a low-grade mixture, commonly an 8–2–2. Smaller quantities are sometimes used on corn land, and sometimes cottonseed meal is added. Nitrate of soda is used as top-dressing on small grains.

Much of this land is held in large estates and is not upon the market. Some tracts recently sold brought from $40 to $100 an acre, and a few more favorably situated are valued at more than $100 an acre.

The Cecil clay loam is deficient in organic matter, and farmers should make a practice of turning under cowpeas, clover, vetch, or rye. The legumes will add nitrogen to the soil even when they are

not turned under. Lime should be applied at the rate of 1 to 2½ tons per acre every four or five years, to loosen up the soil and correct acidity. With the proper farming methods and the plowing under of organic matter with lime, little or no fertilizer is necessary. This soil is difficult to handle, and in order to obtain the best results strong work stock and heavy implements should be employed. More care should be taken in plowing and cultivating, since clodding results from plowing when the soil is too wet and the injurious effects may persist for several seasons. The plowing done is usually too shallow to give best results and should be gradually deepened. Alfalfa should succeed upon this soil, especially upon the deeper red areas.

APPLING SANDY LOAM

The soil of the Appling sandy loam, to a depth of 5 to 7 inches, is a light-gray loose loamy sand. Below this is a layer of yellow friable sandy loam, 3 to 4 inches thick, and below this, at 10 to 12 inches, a subsoil of mottled bright-red and yellow firm but brittle clay. In lower spots and level areas the mottling is inclined to be gray, or the subsoil is yellow streaked with faint red and gray; in the better drained parts the red is more pronounced.

The Appling sandy loam is derived from granitic rocks and numerous rounded bowlders appear upon the surface and embedded in the soil mass. Around these bowlders the sand in the soil is likely to be rather coarse. In places a quantity of blocky white quartz fragments are found upon the surface. Weathering is fairly deep except in spots along the stream edges, where aplitic granite is found and where the weathering is shallow, partly disintegrated bedrock appearing in many places 20 to 24 inches below the surface. These spots represent Wilkes sandy loam, but on account of their small extent they are included with the Appling sandy loam. The soil in these areas is a light-gray loamy sand, 5 to 8 inches deep, passing into a few inches of pale-yellow or grayish-yellow sandy loam. The subsoil is variable, ranging from a light-gray or white sandy clay to a mottled yellow, red, or gray plastic clay, passing below 20 to 24 inches into a whitish plastic clay. Areas of this description occur along the Newberry County line southwest from Cannons Creek and west of Hope, 2 miles northeast and 3 miles south of Batesburg. Another area lies south from Leesville upon the headwaters of Lightwood Creek.

The topography of the Appling sandy loam ranges from undulating to rolling within the divides and broken along the streams. Owing to its sandy nature and favorable topography the surface drainage is well established, except upon the lower slopes along streams and around stream heads.

The type is not extensive and therefore of little agricultural importance. About 30 per cent is improved; the rest is forested with second-growth shortleaf pine and a scattering of hardwood trees, sweetgum and oak predominating. Cotton is the principal crop followed in order of acreage by wheat, oats, and corn. Rye, cowpeas, sorgo, crimson clover, and vetch are secondary crops. Cotton, under former conditions, with a normal amount of fertilizer, produced one-half to 1 bale per acre, and corn 10 to 30 bushels. The yields of small grains are not large. Cowpeas, vetch, and crimson

clover give fairly good returns. Grasses have a tendency to "burn out" in dry seasons.

Land of this type sells for $20 to $65 an acre. A few small areas better situated and more highly improved would bring considerably higher prices.

In addition to plowing under organic matter, this soil should be limed once in every four or five years, especially where it is difficult to obtain a stand of clover. The type is well suited to legumes, and such crops as cowpeas, vetch, velvet beans, and crimson clover should be grown much more extensively. The type is used in other sections for the production of bright tobacco, the product grading high. Complete fertilizers should be used upon nearly all crops. Potatoes and sweet potatoes and such fruits as peaches, plums, and grapes do well on this type of soil.

APPLING FINE SANDY LOAM

In forested areas the soil of the Appling fine sandy loam to a depth of 3 to 4 inches is a dark-gray to gray loamy fine sand, with a surface layer of leaf mold from one-half to 1 inch thick. Below this to 6 or 8 inches the soil is a grayish-yellow fine sandy loam, passing into an intergrade of 3 or 4 inches of yellow fine sandy loam. The subsoil consists of a yellow, faintly mottled or streaked with red, compact, friable clay extending to 20 or 24 inches, where there appears a mottled yellow and red compact brittle clay, continuing downward to a depth of 3 feet or more. In cleared areas the soil is light gray in color to a depth of 5 to 7 inches, passing into the typical section as described above. A few angular fragments of white quartz appear on the surface in places, and in others granite bowlders are imbedded in the soil mass. Except for these the parent rock, a fine-grained granite, is deeply weathered. On the better drained ridges and the breaks of slopes the upper subsoil is more highly mottled with red; in the lower places or swales around stream heads the subsoil is mottled faintly with red and gray. In places the soil carries a noticeable quantity of gritty material. Where the areas lie adjacent to Coastal Plain areas, a few rounded pebbles are scattered over the surface.

The Appling fine sandy loam is developed in irregular-shaped areas scattered through a belt, from 1½ to 3 miles wide, extending along the northern edge of the Coastal Plain, from a point north of Leesville nearly to Rockywell. The topography is that of a series of low ridges broken by streams, giving fairly smooth interior surfaces and undulating or rolling to low smooth hills along the valleys. The drainage is well established, except in a few depressions at the heads of streams. Erosion is not as active as upon most Piedmont soils.

The Appling fine sandy loam, while not extensive, is a fairly important soil. About 50 per cent is cleared and under cultivation. The rest is covered with forest, consisting chiefly of shortleaf pine and white oak, with a scattering of other hardwood trees. Cotton, corn, wheat, oats, rye, and cowpeas are all grown upon a fair acreage. Sorgo is grown both for forage and sirup. Vetch, clover, and potatoes and other vegetables are grown in small patches. Small home orchards, containing apples, peaches, pears, and plums, are found about most of the homesteads. Cotton formerly yielded one-half to 1 bale per acre, but the yield is very uncertain under weevil condi-

tions and ordinarily considerably lower than that stated. Corn yields 15 to 35 bushels per acre, and small grains give fairly good returns, considering the rather indifferent seed bed and the fact that these crops receive no fertilizer except a light top-dressing of nitrate of soda. Cowpeas and sorgo do well; the former yield more than 1 ton of hay per acre. Sown broadcast together these plants give from 2 to 2½ tons of coarse forage per acre.

The soil is easy to handle, requiring light draft. It is deficient in organic matter and little attempt is made to increase the supply. Commercial fertilizer at the rate of 200 to 400 pounds per acre of an 8–3–3 mixture is used on cotton and a smaller quantity on corn.

The methods of improvement as recommended for the Norfolk sandy loam and Appling sandy loam apply equally to this soil.

The following table gives the results of mechanical analyses of samples of the soil, subsurface, subsoil, and lower subsoil of the Appling fine sandy loam:

Mechanical analyses of Appling fine sandy loam

Number	Description	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
		Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
243235	Soil, ½ to 3 inches	3.8	6.2	2.8	23.0	29.4	4.6	30.3
243236	Subsurface, 3 to 8 inches	2.2	6.2	3.2	29.7	33.2	19.1	5.3
243237	Subsoil, 8 to 20 inches	4.4	7.6	3.4	22.0	21.0	18.4	23.3
243238	Lower subsoil, 20 to 36 inches	4.0	9.6	4.6	22.1	16.2	15.7	27.9

GEORGEVILLE SILT LOAM

The surface soil of the Georgeville silt loam in forested areas is a dark yellowish brown mellow silt loam, 5 or 6 inches deep, passing into a reddish-brown fairly heavy but only slightly compact silt loam, which forms an intergrade of 3 to 4 inches between the soil and subsoil. The subsoil proper consists of a red, compact silty clay loam extending to 3 feet or more. The parent rock, the Carolina clay and talc slates, is deeply weathered, being exposed only along the breaks to the streams or in deep gullies or road cuts. In places a quantity of irregular shaped white quartz gravel coming from dikes or veins in the parent rock is scattered on the surface. These gravelly areas in most places occupy knolls, leaving a considerable area of the type practically gravel free. In a few places small platy fragments of slate also appear on the surface and throughout the soil.

In cleared or cultivated areas the surface soil to 6 or 8 inches is reddish brown in color, passing into the red subsoil in many cases without the typical intergrade. In most cases the subsoil lies too deep to be disturbed by the plow, with the usual depth of plowing.

A part of the type derived from talc slates, as in the areas near Chapin, contains more silty material in both soil and subsoil than typical. The partly weathered parent rock is very soft, crumbling readily, and is easily eroded. These areas normally carry more slaty fragments and more quartz gravel than those derived from the harder slate.

Areas of the Georgeville silt loam are scattered generally over the slate belt, and are conspicuous in the northern part of the belt in the

vicinity of Chapin. Their surface in general is undulating to smoothly rolling or hilly, with very little level and little broken land. The topography favors free run-off, and the drainage and aeration are good. Small streams ramify nearly all parts of the upland of this type.

The Georgeville silt loam is a fairly important soil in the part of the county in which it is developed. About 40 per cent of it is cleared and under cultivation. Most of the rest is cut-over land. The forest growth consists of longleaf and shortleaf pine and oak, with a scattering of other hardwood trees. Cotton is the leading crop, with corn second, and oats third in order of importance. Small patches of cowpeas, bur clover, sorgo, and sweet potatoes are grown.

Cotton, the leading crop, produced one-third to three-fourths bale per acre, according to season, fertilizer, and cultural methods, before the advent of the boll weevil. Corn yields range from 20 to 35 bushels per acre, oats 20 to 45 bushels, and wheat 10 to 15 bushels. Cowpeas and bur clover give fair yields of hay.

The Georgeville silt loam is best suited to general farming and stock raising, and more stock is carried on the farms of this type than on the average farm, a relatively large number of cattle being run on the cut-over land. Small grain, especially oats, and legumes, such as cowpeas, vetch, and bur clover, should be the leading crops. This land should produce fairly good yields of both potatoes and sweet potatoes. By following a well-balanced rotation, in which the legumes have a prominent place, relatively small applications of commercial fertilizer will suffice.

The following table gives the results of mechanical analyses of samples of the soil, subsurface, and subsoil of the Georgeville silt loam:

Mechanical analyses of Georgeville silt loam

Number	Description	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
		Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
243269	Soil, 0 to 5 inches	4.0	5.0	1.8	8.2	26.2	48.2	6.7
243270	Subsurface, 5 to 10 inches	1.4	2.6	.8	3.8	14.6	61.6	15.4
243271	Subsoil, 10 to 36 inches	1.9	2.6	.6	2.6	10.0	52.8	29.4

GEORGEVILLE SILTY CLAY LOAM

The soil of the Georgeville silty clay loam in forested areas is a dark reddish brown silt loam to silty clay loam, passing rather abruptly at 2 to 5 inches into a subsoil of red, compact, smooth but friable, silty clay, which extends to a depth of 3 feet or more. In cleared fields the surface soil consists of 5 or 6 inches of a reddish-brown or light-red silty clay loam, the profile below being like that of the virgin areas. The substratum is deeply weathered; only in deep road ditches or cuts is the unweathered slate rock exposed. In places a few scattered fragments of white quartz or slate occur on the surface. In a few places, especially east of Chapin and in a small area 2 miles west of Chapin, the soil has a darker red color and the subsoil is maroon red. In these areas a few fragments of dark-colored schist and some rounded bowlders of diabasic rock are scattered upon the surface or mixed with the soil material.

The Georgeville silty clay loam is developed intermittently in a belt across the northern part of the county in the Saluda River basin. North of the Saluda River from near Leaphart to beyond Amicks Ferry it forms a strip averaging about 1 mile wide, broken only by streams flowing into the river. Other developments occur south of the river from the Saluda County line to near the mouth of Beaverdam Creek, along Beaverdam Creek, and northwest of Hollow Creek. Smaller scattered areas lie northeast of Lexington.

The topography of this type is smoothly rolling away from the main streams to broken along the Saluda River. Drainage is everywhere well established. Along the steeper slopes some gullying has taken place, but most of the type is not seriously affected by erosion.

About 40 per cent of the type is cleared and under cultivation. The forested areas consist mostly of land with broken topography. These are covered with a second growth of shortleaf pine and oak, with a scattering of other hardwoods common to this section. Excepting a small area in Bermuda-grass pastures all the smoother part of the type is used in the production of cultivated crops, chiefly cotton, wheat, oats, and corn. Some bur clover, cowpeas, and vetch are grown. Before the advent of the boll weevil cotton occupied at least 95 per cent of the cropped area. At the present time it is grown upon an acreage equivalent to the combined acreage of wheat, oats, and corn.

Cotton yields at present are rather uncertain, but formerly one-fourth to three-fourths bale per acre was the ordinary range in yield, with 1 bale in exceptional cases. Corn yields 20 to 35 bushels, wheat 10 to 25 bushels, and oats 20 to 45 bushels per acre. The cultural methods followed on this soil are essentially the same as on the Cecil clay loam. The kinds of fertilizers and the rates of application are in general the same, though fertilizers are not considered by some as necessary as on the Cecil.

Land of the Georgeville silty clay loam type is valued for the most part at $20 to $50 an acre, with a few tracts held as high as $75 to $100 an acre.

The Georgeville silty clay loam is naturally a strong soil and susceptible of improvement, although its heavy texture and lack of organic matter makes it somewhat difficult to handle. The structure could be greatly improved by adding coarse manure or turning under green-manure crops, such as cowpeas, vetch, or bur clover. The growing of these legumes would not only supply the necessary organic matter but also furnish sufficient nitrogen to produce good crops without the use of a nitrogenous fertilizer. This soil should be plowed deeper, thoroughly pulverized, and given liberal applications of lime. Erosion is active upon the steeper slopes, and terracing is necessary to prevent washing in cultivated fields. The steeper slopes should either be seeded to Bermuda grass and used for pasture or allowed to remain in forest.

ALAMANCE VERY FINE SANDY LOAM

In forested areas the soil of the Alamance very fine sandy loam consists of a layer of gray very fine sandy loam 2 or 3 inches thick, grading into a somewhat deeper layer of pale-yellow very fine sandy loam of mellow structure. The subsoil proper, appearing at 10 to

12 inches below the surface, consists of a yellow friable silty clay loam. In places the lower subsoil is faintly mottled with red. The soil is deeply weathered, the parent rock—a talcose slate—being nowhere seen at the surface. Under cultivation the soil is a gray very fine sandy loam, 5 or 6 inches deep.

This type of soil is mapped in the western part of the county along the Saluda County line from a point about 4 miles north of Batesburg to about 2 miles south of the Saluda River. This area widens and extends eastward about 5 miles along the ridge north of Hollow Creek. Small areas of the type also are mapped northeast of Chapin. In places, commonly on knolls, blocky white quartz fragments appear on the surface. These spots are shown on the map by gravel symbols.

The surface is gently undulating to rolling, the areas occupying in most places the marginal parts of the divides, and the drainage is excellent.

The Alamance very fine sandy loam is an inextensive type and only about 40 per cent is cleared and under cultivation. The rest is largely cut-over land, supporting a growth of blackjack oak with a scattering of round-leaf post oak, hickory, and shortleaf pine. The leading crops are cotton, corn, wheat, oats, and rye. Sorgo, cowpeas, vetch, crimson clover, and potatoes are the secondary crops. Cotton yields one-fifth to one-third bale per acre, corn 10 to 25 bushels. Wheat gives light yields but rye does somewhat better. Cowpeas and crab grass yield about 1 to 1½ tons of hay per acre. Sorgo and cowpeas give heavy yields of coarse forage.

The soil is easy to cultivate and responds readily to commercial fertilizers, to manure, and to green-manure crops. More attention should be given to growing cowpeas, vetch, and other legumes. Where cover crops are turned under light applications of lime would prove beneficial. Fertilizers relatively high in phosphate should be used. This soil is fairly well suited to the production of bright-leaf tobacco and also potatoes, though these are not grown commercially at the present time.

ALAMANCE SILT LOAM

In forested areas the upper layer of the soil of the Alamance silt loam, 2 or 3 inches thick, is a gray silt loam containing some vegetable mold. Below this to 8 to 12 inches the material is a pale-yellow friable silt loam. The subsoil consists of a compact but friable, smooth, yellow silty clay loam. In fields under cultivation the soil is a grayish-yellow to pale-yellow floury silt loam, 5 or 6 inches deep, passing into the typical subsoil as described above. On ridges or knolls the subsoil below 24 to 30 inches is mottled faintly with red and in low places or depressions with gray. Plowed fields have a decidedly gray surface appearance when drying out. Partly decomposed gray slate is often encountered in the lower part of the 3-foot profile.

Patches are occasionally developed, normally in seepage areas on hillsides or around stream heads, in which the surface soil is very light gray, almost white, and others in which the deep subsoil has a whitish appearance. In scattered areas the surface soil contains a

noticeable amount of very fine sand. The soil of extensive areas carries on the surface small black iron concretions.

A small quantity of quartz gravel also appears on the surface and throughout the soil, the quantity in places being sufficient to give a gravelly soil. The quartz fragments are subangular and vary from less than an inch to a foot in diameter. In a few places outcropping quartz veins are still intact. Slate fragments are less plentiful than those of quartz, but appear in a few places on the surface and here and there are abundant enough to give rise to so-called slate knolls.

The Alamance silt loam is mapped in irregular-shaped areas in the Saluda River basin. The areas range in topography from fairly level to gently rolling or sloping, and, in narrow belts along the streams, to rough and broken. Drainage is fairly good, except in a few places where the shale comes close to the surface, preventing underdrainage, and on some of the slopes where seepage water reaches the surface. Erosion is nowhere very active.

This is not an important soil, probably less than 25 per cent being cleared and under cultivation. The forest areas support a growth of pine and hardwoods, chiefly oaks. The growth in cut-over areas is largely blackjack oak and in abandoned fields pine. Cotton is the principal crop, followed by corn, wheat, oats, and cowpeas. Rye, sorgo, sweet potatoes, and vegetables are given small acreages. A few cattle and hogs are run in the woodland. These subsist chiefly upon the products of the forest, as there is very little grass. Cotton formerly yielded one-fourth to one-half bale per acre, but under weevil conditions the yield is much less. Corn yields 10 to 25 bushels per acre. Oats and wheat give moderate yields, little attention being paid to their culture. Cowpeas do fairly well.

Some of this land has not been under cultivation long, and other areas are being cleared and brought under the plow. Little or no attempt is made to build up the soil by turning under green crops, and where it has been under cultivation a few years it is deficient in organic matter. Commercial fertilizers are depended on to maintain yields. From 200 to 500 pounds of an 8–3–3 fertilizer mixture per acre is commonly used in growing cotton.

This land is not valued very highly for farming. It is spoken of as "blackjack" land or "slate land". Its selling price ranges from $15 to $35 an acre.

In the improvement of this type it is very important that organic matter be added in large quantities. Crimson clover and other legumes, such as vetch, velvet beans, and lespedeza, could be grown to advantage. Since manure can not be obtained in sufficient quantities, cover crops, stubble, and sod should be turned under. Lime could be applied to advantage where the haul is not too great, and in any case it should be used in small quantities. Complete fertilizer should be used upon nearly all crops, but if the above practices were introduced the quantity can be reduced, especially the nitrogen carriers. This soil is used in some sections for the production of bright tobacco.

The table following gives the results of mechanical analyses of samples of the soil, subsurface, subsoil, and lower subsoil of the Alamance silt loam:

Mechanical analyses of Alamance silt loam

Number	Description	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
		Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
243275	Soil, 0 to 2 inches	1.9	3.5	1.2	5.0	13.2	61.0	14.2
243276	Subsurface, 2 to 8 inches	1.1	1.7	.8	4.0	13.2	69.6	9.5
243277	Subsoil, 8 to 30 inches	.9	1.4	.5	3.0	13.5	57.9	23.0
243278	Lower subsoil, 30 to 36 inches	1.0	.8	.4	1.6	8.8	50.3	37.1

CONOWINGO SILT LOAM

The soil of the Conowingo silt loam in forested areas is a light-gray to yellowish-gray silt loam containing little organic matter, passing at 4 to 8 inches into a yellow, faintly mottled with red, light, friable heavy silt loam to silty clay loam. At a depth of 12 to 16 inches there appears a somewhat impervious subsoil of brownish-yellow heavy plastic clay. At 24 to 36 inches the partly weathered parent slate is encountered. In cultivated areas the soil has a dark grayish brown color and contains a quantity of small black and brown iron concretions. In poorly drained areas, particularly around stream heads and on the upland between stream heads, the soil is light gray and the upper subsoil is whitish or mottled yellow and white. On the better drained knolls the surface soil has a decidedly yellowish brown cast.

The topography of the Conowingo silt loam is fairly level to gently undulating. Drainage is only fairly well developed, the run-off being imperfect and the underdrainage, owing to the impervious character of the subsoil, insufficient. The land, therefore, remains water-soaked after wet seasons. The shallow reservoir for water in the soil above the plastic subsoil allows the rapid drying out of the soil in dry seasons.

This type is not extensive and is of little importance. It is developed in small areas scattered through the slate belt. Less than 20 per cent of the land is under cultivation; the rest is in forest consisting largely of white oak, post oak, red oak, and hickory, with some admixture of sweetgum, cedar, and shortleaf pine.

Cotton, corn, and small grains are the leading crops and cowpeas and sorgo the main secondary crops. The yields are only fair, wheat and oats giving better yields than any other crops, but little grain has been grown in the past. Corn yields 15 to 20 bushels per acre. In former years cotton averaged one-fourth to one-half bale per acre, with occasional yields of two-thirds bale per acre in good seasons. The soil is difficult to handle, owing to the dense, compact subsoil and relatively short time in which the soil remains in the proper moisture condition for working.

The price of land of this type ranges from $10 to $40 an acre, according to location and improvement.

Oats, wheat, and other small grains should be the leading crops and cowpeas and other legumes should be grown in rotation with these and cotton. Sorgo and cowpeas combined make a forage crop well adapted to the local conditions. Kainit should be used as a fertilizer to prevent rust of cotton and the "frenching" of corn. The application of lime would prove profitable, as much of the soil is acid. The application of large quantities of coarse manure and the turning

under of green-manuring crops would improve the structure and increase the power of the soil to hold moisture.

BRADLEY GRAVELLY FINE SANDY LOAM

The surface soil of the Bradley gravelly fine sandy loam consists of 5 to 8 inches of brown gravelly fine sandy loam. This passes through a gradational zone, 3 to 5 inches thick, of yellowish-red heavy fine sandy loam, containing some gravel, into the subsoil proper, which is encountered at 10 to 12 inches and is a red friable smooth clay, slightly mottled with yellow in the lower part of the 3-foot section.

The subsoil is residual, being derived from the Carolina slates, and the surface soil is Coastal Plain material. The gravel, which consists of small angular and rounded fragments of quartz, constitutes 30 to 40 per cent of the soil mass. There is no gravel in the subsoil or substratum. The slate formation is deeply weathered and is seen only in a few places in ditches.

The Bradley gravelly fine sandy loam is not very important. It occurs along the contact of the slate formation and the Coastal Plain deposits and is developed where the latter thins out in overlapping the slate. The largest areas of this type of soil lie south of Batesburg along Duncan and Chinquapin Creeks. Several small areas are situated north of Summit, in the vicinity of Lexington, and east of Leaphart. The topography is gently rolling to rolling and hilly. Both surface drainage and underdrainage appear to be well established. Erosion is not active, as the gravel forms a protective covering for the soil.

This soil occupies a small area. About 40 to 50 per cent of it is cleared and under cultivation, the rest being in forest of shortleaf pine and mixed hardwoods, among which white oak is prominent.

Cotton, corn, oats, and wheat are the leading crops. Rye, crimson and bur clover, vetch, cowpeas, sorgo, and sweet potatoes are grown upon a small acreage.

Little effort is made to improve the land. Commercial fertilizers are used to maintain or increase the yields. Cotton yields one-fifth to one-third bale, corn 20 to 40 bushels, wheat 15 to 20 bushels, and oats 20 to 30 bushels per acre. Cowpeas and crab grass give fairly heavy yields of hay, and cowpeas and sorgo good returns of coarser forage.

The Bradley gravelly fine sandy loam is deficient in organic matter, and cover crops should be grown and turned under. Stable manure should be used where available. The application of about 1,000 pounds of lime per acre would prove beneficial. Legumes should be introduced in rotations with the cash crops.

The following table gives the results of mechanical analyses of samples of the soil, subsurface, and subsoil of the Bradley gravelly fine sandy loam:

Mechanical analyses of Bradley gravelly fine sandy loam

Number	Description	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
		Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
243222	Soil, 0 to 8 inches	5.6	5.8	3.6	40.4	25.9	12.7	6.2
243223	Subsurface, 8 to 12 inches	3.0	3.9	2.9	37.0	25.8	17.4	10.6
243224	Subsoil, 12 to 36 inches	.2	.9	.7	9.9	7.5	14.2	66.8

CHESTERFIELD GRAVELLY FINE SANDY LOAM

The soil of the Chesterfield gravelly fine sandy loam in forested areas consists of a layer of leaf mold about 1 inch thick, resting on a dark-gray loamy fine sand which extends to a depth of 4 to 6 inches. Below this to 12 or 20 inches is a pale-yellow gravelly fine sandy loam, which passes into a yellow, compact but friable clay containing faint red mottling in the lower part of the 3-foot profile. The gravel consists of white quartz fragments, rounded to angular in form. The content of gravel is variable. The substratum is derived from slate, which in most places is deeply weathered, though in some the partially weathered slate lies within 3 feet of the surface. In cleared fields the soil is light gray in color. In places, usually adjacent to the sand deposits, there is very little gravel and the texture of the soil becomes sandy.

The Chesterfield soil is developed in small areas only. It lies mainly in the belt where the unconsolidated deposits of the Coastal Plain overlap. The type is influenced also by the drainage conditions and occurs only where seepage water finds its way to the surface. The largest areas lie south of Batesburg, northeast of Leesville, and near Lexington and Leaphart. The topography is undulating to rolling and in places hilly.

The run-off is rather rapid, but drainage is only fair owing to seepage waters that come mostly from the higher lying Coastal Plain areas.

Like the Bradley gravelly fine sandy loam, this type is not extensive. It is not as good a soil as the Bradley. From 35 to 40 per cent of it is cleared and under cultivation, and the rest is covered with a second-growth forest of post oak, blackjack oak, water oak, shortleaf pine, and a scattering of other species, mainly hardwoods.

The same crops are grown in about the same proportions as upon the Bradley soil, but the yields are slightly lower. The same general cultural and fertilizer practices are followed on the two types; they often form parts of the same farms.

The same methods for improvement are recommended for this type as for the Bradley, but lower yields may be expected.

NORFOLK COARSE SAND

The top layer of the soil of the Norfolk coarse sand in forested areas is a dark-gray coarse sand from 2 or 3 inches deep. Below this is a layer of brownish-yellow coarse sand which extends to a depth of 6 or 8 inches. The subsoil is a yellow coarse sand becoming slightly pale near the bottom of the 3-foot profile. Material of like nature continues to 3 to 6 feet or more, where it rests upon a bed of unconsolidated sand and clay like that giving soils of the Hoffman series. The structure of the material throughout the profile is incoherent; the texture ranges from medium to coarse and in places is very coarse. In cultivated areas the surface soil is gray or dark gray to 6 to 10 inches. The Norfolk coarse sand is slightly more loamy than the Norfolk sand and is generally shallower over the heavy substratum.

Areas of this soil occur on broad, flattened ridges representing remnants of the northern edge of the sand plain. The type is extensively developed over a wide belt in the central part of the county

from Summit on the west to Lexington on the east. Scattered areas are found in proximity to the main body of the type and throughout the south-central part of the county.

The topography is level to undulating and sloping. The drainage, although entirely internal, is so thorough that crops suffer greatly in dry seasons for lack of moisture. Small areas of this type occupying slight depressions in the Norfolk sand are usually slightly more loamy, have a darker surface soil, and rest on an orange-yellow subsoil. These really consist of the loamy coarse sand of the series.

The Norfolk coarse sand is fairly extensive and is agriculturally important in the county. From 40 to 50 per cent is cleared and used for agriculture, the rest is forested with blackjack oak and longleaf pine. Most of the forested area has been cut over, and nearly all the good timber has been removed; but few areas of the original forest are still standing. This consists of longleaf pine with an admixture of some blackjack oak. Very little grass or underbrush is found in the original forest. Cotton, rye, corn, oats, and wheat are the principal crops. Cowpeas, velvet beans, vetch, sorgo (for forage and sirup), peanuts, potatoes, sweet potatoes, melons, and vegetables are minor crops. A number of small peach orchards are situated on this soil. Little livestock, aside from hogs and chickens, is kept.

Yields on this soil are slightly better than on the Norfolk sand. Rye gives exceptionally good yields. There are a number of homesteads on the type, and it is probably farmed better than any other of the more sandy soils. All the land is deficient in organic matter and in only a few cases is any effort made to build it up by growing legumes or turning under green crops. The small quantity of manure available is usually applied in the cotton or corn rows and to garden patches. Commercial fertilizer of 8–2–2 to 8–4–4 grades was formerly applied at the rate of 300 to 1,000 pounds per acre to cotton, but with the uncertainty of yield since the appearance of the weevil there has been a tendency to use smaller applications for cotton and little or none for other crops except the small grains, to which is given a top-dressing of nitrate of soda. Land of this type sells for $20 to $50 an acre.

For the improvement of this soil organic matter should be supplied by growing and turning under winter cover crops, preferably rye, and by growing legumes such as cowpeas, velvet beans, vetch, and crimsonclover. The type seems adapted to these crops and to such crops as early potatoes, sweet potatoes, cucumbers, beans, watermelons, cantaloupes, peanuts, and sorgo. Among the fruits peaches and grapes are most satisfactory. It also can be used for growing bright tobacco. Fertilizers suitable for the crop to be grown should be used consistently, as soils of this character do not long retain the elements of fertility applied in cultivation.

NORFOLK SAND

The virgin soil of the Norfolk sand consists of 3 or 4 inches of dark yellowish brown sand the upper half-inch layer of which contains a little organic matter. The material from 4 to 8 or 10 inches is a yellowish-brown or yellow sand and this is underlain by a subsoil of pale-yellow, yellow, or orange-yellow sand, which extends to depths

of 3 to 10 feet. The substratum is a sandy clay, which may vary from the yellow color of Norfolk material to the redder color shown by soils of the Hoffman, Ruston, or Orangeburg series. The structure of the whole profile is more or less incoherent; the texture is prevailingly medium sand. In general, the surface soil in cultivated fields is light gray to yellowish gray. Only in some of the lower areas or depressions is it dark gray. Here, too, the texture is more loamy. Some parts of the more rolling areas have a tendency in the opposite direction, the texture being coarser than typical.

Included with this type are spots of Kalmia sand developed on the terraces of the North Fork Edisto River from Horseys Bridge to the mouth of Lightwood Creek and upon Black Creek from Rambo Bridge to the Pelion-Gunters Bridge road. These areas lie 5 to 25 feet above the level of the first bottoms, the Kalmia being a terrace series. Small areas, also included with the Norfolk, lie in parts of the North Fork Edisto River bottoms that stand well above normal overflow. The soil in these consists of a white, loose, incoherent sand having a depth of 3 to 10 feet or more. The surface is prevailingly level to hummocky. Part of the surface is barren of vegetation, and most of it is covered with a scattering growth of pine and blackjack oak, with some low sparkleberry and gallberry bushes. These sandy areas are situated at White Bluff Bridge and between this point and the mouth of Black Creek. They have little or no agricultural value.

The Norfolk sand is developed on the flattened ridge or remnant of an extensive ancient sand plain. These areas, which are irregular in shape, extend from near Batesburg and Leesville southeastward to the Orangeburg and Calhoun County lines and along the ridge between Lexington and New Brookland. The topography is fairly level or undulating to gently sloping. The drainage is largely internal, little of the rainfall finding its way to surface channels. The drainage is thorough and in many cases inclined to be excessive.

The Norfolk sand is the most extensive soil in the county, forming 22 per cent or, with its sand-hill phase, 38.4 per cent of the area of the county. Although only 20 to 25 per cent of the typical Norfolk sand is under cultivation it is potentially an important soil and practically all of it could be utilized for crop production. The original forest consisted of longleaf pine and some blackjack oak, but at the time of the survey nearly all the original growth had been cut over and the forested areas supported a second-growth blackjack oak and a scattering of longleaf pine.

Cotton, corn, rye, oats, and sweet potatoes are the leading crops. Some wheat, cowpeas, vetch, velvet beans, peanuts, and sorgo are grown. A number of commercial peach orchards, several of them large, are on this soil. Little livestock is kept; the type is not naturally a good grass soil and the virgin areas give indifferent pasturage. Hogs are the most important of the food animals raised.

Yields vary considerably with the seasons and amount of fertilizer used. In dry seasons lack of moisture cuts the yields short and in excessively wet years the full effect of fertilizer is lost through leaching.

Cotton yields are low, owing to the injury done by the weevil, but it is stated that more cotton can be obtained on sandy soils under weevil conditions than upon the heavier soils. Corn yields range from 10 to 20 bushels per acre, with an average of about 15 bushels. With better methods—that is, when green crops are turned under or

manure used and when liberal applications of fertilizers are made—35 to 40 bushels of corn per acre is not an unusual yield in favorable seasons. Rye makes exceptionally good yields, especially on land where cowpeas or some legume has preceded the grain. Oats give fairly good returns when the spring season is not too dry. Grass burns out readily upon this land. Cowpeas and sorgo give good yields of hay. Sweet potatoes yield 150 to 250 bushels per acre, but have a tendency to be stringy if not heavily fertilized.

The farming methods on this type are essentially the same as on the other Coastal Plain soils. Practically no effort is made to maintain or increase the organic matter supply in the soil or to prevent leaching by protecting the surface during the winter months. The supply of stable manure is small, only enough to cover small patches of special crops and garden plots. The total quantity of fertilizers used varies from season to season but, as is usual on soils of this sort, much dependence is placed upon their use. The rate of application varies from 400 to 700 pounds per acre, and the mixtures are for the most part low-grade 8–2–2 or 8–3–3 brands.

Most of the fertilizer used is applied to cotton. It is the custom to apply half the specified quantity before planting and the rest after the plants start to grow. This method is followed sometimes in growing corn. Nitrate of soda is used as a top-dressing for the small grain.

The Norfolk sand sells for $10 to $100 an acre according to location and improvement. The range for unimproved land is $10 to $20 an acre, and much of the improved land has a value between $40 to $60 an acre. The higher priced land—that is, that bringing between $60 and $100 an acre—consists of tracts with exceptionally good situations and improvements.

For the improvement of this type more cover crops, such as oats, wheat, or rye, should be grown to protect the soil during winter. More legumes, such as cowpeas, vetch, and velvet beans, should be grown to increase the nitrogen in the soil, and some of these crops should be turned under at frequent intervals to increase the content of organic matter. One object of the latter practice is to increase the moisture-holding capacity of the soil. Complete fertilizer should be used with nearly all crops. The soil is naturally suited to the growing of rye, vetch, velvet beans, peanuts, sweet potatoes, melons of all kinds, light truck crops, and peaches. Commercial orcharding and trucking should be given more attention.

Norfolk sand, sand-hill phase.—The sand-hill phase of the Norfolk sand corresponds closely to the typical soil in color, texture, and structure, but differs in topography and depth of sandy soil material. The soil is a gray incoherent sand, 5 to 7 inches deep, passing into a pale-yellow incoherent sand which extends downward to the clay substratum which appears at depths ranging from 5 to 25 feet or more. The depth of this heavy stratum varies widely within comparatively short distances. The substratum consists of material similar to that giving the Hoffman soils over the northern part of the sandy belt and the Ruston soils in the southern half of the county. In places upon the steep hillsides the substratum comes close to the surface, outcropping in spots.

In forested areas the surface appears white, but this coating of white sand is usually not more than one-half inch in thickness.

This phase contains some low places or swales, in which the soil is brown in color and inclined to be loamy and the subsoil is orange yellow. It also contains some areas of coarse texture.[7]

The sand-hill phase of the Norfolk sand is the second most extensive soil in the county, being exceeded in area only by the typical soil. It occurs in its largest developments in the south-central part of the county, where it occupies a more or less broken belt extending practically across the county. Other scattered areas are found over the southeastern and southwestern parts, where it occupies the broken edge of the Lexington sand plain around the heads of creeks that have cut back into the plateau. Several small sand hills formed of wind-blown material were noticed, the material in most of these ranging toward a fine sand, usually deeper than over the remainder of the phase.

The topography on the divides is broadly rolling to rolling, rapidly becoming rolling to hilly as the drainage ways cut deeper into the formation. Where the phase is developed as the eroded edge of the sand plain the topography is fairly steep and tongues of the material follow the streams back into the plateau for long distances. The phase only in a few places extends to the stream courses, a narrow margin of Hoffman coarse sandy loam usually intervening. The drainage is largely internal, and numerous springs coming out at the base of the sand hills feed the streams, which reach a considerable volume within a short distance.

Very little of the sand-hill phase is under cultivation. The region is very sparsely settled. The cleared area is being extended, but very slowly. Most of the land is in the condition known as cut-over land; all the merchantable timber has been removed, leaving a growth of blackjack oak with an occasional survivor of the original longleaf pine forest. In a few spots where the soil mantle is shallow a sturdier growth is maintained. A number of small longleaf pines were noticed coming in upon this land. There is very little grass. The phase is very low in organic matter, with a correspondingly low moisture-holding power. It is one of the earliest soils in this region, is easily tilled, and responds readily to fertilizer. The yields range slightly lower than upon the typical Norfolk sand and are more uncertain. The same crops are grown as upon the typical soil. Peaches seem to do as well on the phase as on the Norfolk sand. The phase has a low selling value.

The same methods of improvement may be carried out upon this land as recommended for the typical Norfolk sand. Peaches, apricots, and plums succeed, and where transportation facilities and markets are at hand commercial peach orcharding could be developed. This land is also suited to the growing of dewberries and other brambles. It is used for the production of dewberries on a commercial scale in North Carolina. This sand-hill phase should be protected from fires and hogs and allowed to reseed itself to longleaf pine. There are enough mother trees scattered over the areas to furnish seed for this purpose.

[7] A separation between coarse and medium in the sand-hill phase is not attempted, as it would be more or less arbitrary, and as there is practically no difference in agricultural value.

NORFOLK COARSE SANDY LOAM

The virgin soil of the Norfolk coarse sandy loam is a dark yellowish brown coarse loamy sand, loose and open in structure and 2 or 3 inches deep, passing into a yellow light coarse sandy loam or loamy coarse sand, slightly sticky but not compact, extending to a depth of 10 or 12 inches. Below this appears a yellow sandy loam, not very compact but sticky, containing small iron concretions and gravel. The subsoil proper is encountered at 15 to 24 inches and consists of a yellow coarse sandy clay containing a few faint red or rusty-brown mottlings below 30 inches. In most places the substratum is the characteristic material giving the Hoffman soils. In places the coarse loamy sand of the surface layer extends to depths of 30 inches; in other spots the sandy loam carries a noticeable quantity of gravel and iron concretions on the surface. In cleared areas the surface soil to 6 or 7 inches is a gray loamy coarse sand.

The Norfolk coarse sandy loam is found in irregular-shaped areas along the lower slopes south of Batesburg, along Chinquapin Creek, and along the northern escarpment of the sand belt from north of Batesburg to Cayce. The topography is level or undulating to sloping. The surface in many places is more broken or more sloping than that of the Norfolk sandy loam, also the depth of sand is more variable and the depth to the subsoil on the average greater than in the sandy loam. Most of the drainage is internal and well enough established to give a well-drained soil.

This soil, although not extensive, is fairly important, about 40 per cent of it being cleared and under cultivation. The prevailing forest consists principally of longleaf pine, with a scattering of hickory, and white, post, and blackjack oak. There is only a scant growth of grass and little underbrush in these wooded areas. The uncultivated area is as well suited to crops as that under cultivation.

Cotton, corn, rye, oats, wheat, and cowpeas are the leading crops. Sorgo, vetch, crimson clover, sweet potatoes, and peanuts are grown on small acreages. Some small orchards, in which peaches predominate, and a few small vineyards of Scuppernong grapes are seen. Cotton yields from one-fifth to one-half bale per acre, and with good care and heavy fertilization, 1 bale. Corn yields 15 to 30 bushels per acre, oats 15 to 25 bushels. Wheat gives low yields, but rye does exceptionally well. Peaches, grapes, and most vegetables succeed. Sweet potatoes yield 100 to 150 bushels, and potatoes 50 to 75 bushels per acre. Cowpeas and crimson clover give fairly good yields.

This soil is not quite as well farmed as the Norfolk sandy loam, and this accounts in part for the lower yields. The type is low in organic matter and the system followed has returned little in the way of humus to the soil. Commercial fertilizers have been depended upon to keep up yields, the small quantity of manure available being applied to garden patches and other crops of small acreage. The soil has a relatively high moisture-holding capacity, is easily tilled, and responds readily to fertilizers and other steps looking to its improvement. The land may be cultivated under a wide range of moisture conditions. The methods of handling this land are essentially the same as on the Norfolk sandy loam. The more sloping areas are terraced. The sale value of this land ranges from $25 to $100 an acre.

NORFOLK SANDY LOAM

The surface soil of the Norfolk sandy loam is a light-gray to gray loamy sand, 6 or 8 inches deep. This passes into a pale-yellow loamy sand which extends to a depth of 12 to 18 inches. Below this appears what is generally called the subsoil, a yellow friable sandy clay, usually mottled faintly with red or yellowish brown near the bottom of the 3-foot section. In the northern part of the region the substratum is strongly mottled and has all the characteristics of the Hoffman subsoil; in the southern part of the county the substratum is Ruston in character in both structure and color. There are a few areas in the southern part of the county where the depth to the sandy loam subsoil is 30 inches. Over the rest of the type the subsoil is uniform, conforming to the above description. In a few swales or low spots the mottling in the deep subsoil is gray.

The Norfolk sandy loam is comparatively extensive, and is found in three principal areas in the Coastal Plain section: On the flat ridges from the Saluda County line through Batesburg and Leesville; in the vicinity of New Brookland and Cayce; and in the southern part of the county, south of a line through Pelion and Gaston. A few small scattered areas occur in the section between Pelion and Batesburg. The topography is prevailingly level to undulating with very few areas hilly. The drainage, which is largely internal, is thorough though not excessive.

The Norfolk sandy loam is one of the most important soils in the county. From 65 to 70 per cent is cleared and used for crop production; the rest is covered with a forest, partly in the cut-over condition and partly a more advanced second growth. The original forest consisted largely of a more or less open growth of longleaf pine with little grass or underbrush. The cut-over land has considerable small blackjack and round-leaf oak, some shrubs, and a scattering of other hardwood trees. In some places the second growth is nearly all longleaf pine. The leading crops are cotton, corn, wheat, oats, rye, and cowpeas. Some crimson clover, vetch, sorgo, velvet beans, and peanuts are grown upon small acreages. Both potatoes and sweet potatoes are produced in a small way. Home orchards, in which peaches are the dominant fruit, with some summer apples, pears, and plums are on many farms. Several fair-sized pecan groves are growing on this soil in the vicinity of Batesburg and Leesville. Tobacco has been grown on a small scale near Leesville and in the southern part of the county.

Yields probably average better on this soil than any other of the extensive soils of the county. This soil is said to give fair yields of cotton even under weevil conditions. Oats yield 20 to 40 bushels per acre. Rye yields well and wheat fairly well. Cowpeas yield 1 to 1½ tons of hay per acre. Crimson clover does well. The yield of sweet potatoes ranges from 150 to 250 bushels, and of potatoes from 50 to 100 bushels per acre.

Although this soil is probably better farmed than any other in the area, it is only upon the better farms that any attempt has been made to maintain or increase the supply of organic matter. Many fields have been used continuously for the same crop for many years, and in many others the only change has been from cotton to corn, or vice versa. In most cases the land is left bare in winter, thus

being subjected to the maximum effects of erosion and leaching. Fertilizers are depended upon to maintain productiveness. In former years large quantities, 300 to 1,000 pounds, of 8–3–3 fertilizer per acre were used on cotton, and smaller quantities on corn. During the years of the World War, when the cost of fertilizer was high, the quantities applied were reduced very considerably and at the present time, under weevil conditions, the tendency is to use a good grade of fertilizer, but in small applications. Some farmers apply fertilizer before planting cotton or corn; others apply half before and half to the growing crop. Little or no fertilizer is used on grain crops, but nitrate of soda is used as a top-dressing.

Land of this type ranges in price from $50 to $250 an acre, the highest priced land being in the vicinity of Batesburg and Leesville.

The Norfolk sandy loam is adapted to a wide range of crops, both general and special, some of which are not grown or grown only to a small extent for home use. It is a good cotton and fair corn soil, and where situated near transportation lines it can be used for growing truck crops. In the trucking districts of this State, Georgia, and North Carolina it is used extensively in growing early potatoes, asparagus, cucumbers, beans, strawberries, cabbage, and tomatoes. In the eastern counties of South Carolina it has been found a valuable soil for the production of bright-leaf tobacco, and there is no doubt that the crop would succeed here under careful management. The soil is also well suited to the production of sweet potatoes.

Leguminous crops such as cowpeas, velvet beans, vetch, and crimson clover should be grown more extensively in the rotations. The supply of organic matter in the soil is low, and this constituent should be added by occasionally turning under a green-manure crop. The application of lime every few years would be beneficial, especially where clovers fail to make a good stand. Complete fertilizer should be used upon this land for nearly all crops. A systematic crop rotation, preferably one including the legumes adapted to this section and soil, should be followed. Improved 2-horse implements, especially sulky cultivators, should be substituted for the plows and ordinary cultivators now used.

MARLBORO SANDY LOAM

In virgin areas the Marlboro sandy loam consists of an upper layer of dark-yellowish to grayish-brown light sandy loam, 4 or 5 inches deep, a middle layer of brownish-yellow sandy loam extending to a depth of 10 or 12 inches, and a lower layer, forming the subsoil, consisting of yellow sandy clay, fairly compact and sufficiently sticky to roll on the auger. In places the subsoil changes below 20 or 30 inches to a yellow and red mottled, friable sandy clay. Iron concretions are common upon the surface and throughout the profile. In plowed fields the soil has a yellowish-brown appearance. The surface soil of some areas is shallow, the sandy clay subsoil appearing 6 or 8 inches below the surface.

The Marlboro sandy loam is developed in scattered areas in the belt of shallow sandy soils that encircles the sand-hill region. The largest areas lie south of Gaston to Swansea and over the region southwest of Swansea and south of Pelion. Scattered areas are developed between Pelion and Black Creek, and in the vicinity of Batesburg

and Leesville. The topography is level to undulating or gently sloping. The type occupies the flattened tops of the highest ridges in the region where it is developed. The drainage is good, although almost wholly internal. The moisture-holding capacity is higher than for any other soil in the county.

The Marlboro sandy loam covers only a little more than 5 square miles, less than 1 per cent of the area of the county. It is a valuable soil, and fully 70 per cent of it is cleared and used for crops. The uncleared areas support a forest of longleaf pine, with a scattering of hardwood trees, including white, red, and post oak, hickory, and dogwood.

Cotton is the leading crop, with corn second, followed by oats, wheat, and cowpeas. Rye, crimson clover, vetch, sorgo, and sweet potatoes are grown only in small patches.

The yields over a period of years probably average higher upon this soil than any other in the county. Cotton yields one-half to 1½ bales per acre, corn 20 to 50 bushels, oats 20 to 40 bushels, and cowpea hay 1½ to 2½ tons.

Before the advent of the boll weevil the Marlboro sandy loam was one of the soils planted to cotton almost to the exclusion of other crops, and more cotton still is being planted per acre farmed than upon any other soil.

The fertilizer practices are about the same as upon the other sandy loam soils. Under normal conditions from 300 to 700 pounds of an 8–3–3 mixture were applied to cotton; the applications in 1922 ranged from 250 to 500 pounds. Much smaller quantities are used for corn, and little or none for other crops. Available manure usually is applied to the gardens or small fields of special crops.

The Marlboro sandy loam is one of the most valuable soils in the county. The selling price ranges from $75 to $250 an acre, according to location and improvements, with the average price around $150 an acre.

The Marlboro sandy loam is well suited to general farming, including the production of such crops as cotton and corn. It is better adapted to grain and grasses than any other of the sandy loam soils, and is sufficiently well suited to the legumes to make their inclusion in the rotations advantageous. The soil is also adapted to the production of heavy truck crops, such as cabbage and beans.

This soil, so far as is known, has not been used for the production of tobacco, but there is no reason why this crop should not be grown successfully on land of this type wherever economic conditions are favorable. The growing of general farm crops, and this combined with the production of hogs and beef cattle or with dairying, would seem to be, however, the most profitable way of using the Marlboro sandy loam.

RUSTON LOAMY SAND

The soil of the Ruston loamy sand is a dark-brown to brown loamy sand about 6 to 8 inches deep, passing downward into a reddish-brown loamy sand, which extends to 12 or 18 inches, and then into a light reddish brown loamy sand. The material throughout the profile is mellow and loamy.

There are a number of variations from this typical description. In low spots a greater proportion of organic matter gives a very dark brown surface soil, and in such places there appears an orange-colored subsoil. In other places where better drainage prevails the surface soil is gray and the subsoil a bright reddish brown to red. The type usually occupies depressions within that part of the Norfolk sand country that is underlain by Ruston material. In several places the type represents areas where the materials have been washed in from the hillsides of the rolling Ruston sandy loam; others occur upon the upland along streams where wash has removed part of the red clayey material.

The typical soil is found in comparatively small areas scattered through the region between Gaston and Pelion and Steedman, and extending north to the vicinity of Summit. Fairly large areas where the sand material is coarse in texture lie east of Swansea.[8]

The topography of the Ruston loamy sand is fairly level to gently sloping. The drainage is internal but adequate.

The total area of this soil is not large, between 4 and 5 square miles. About 75 per cent of it is under cultivation; the rest supports a mixed longleaf-pine and scrub-oak forest. Cotton, corn, oats, rye, and cowpeas occupy the largest acreages. Wheat, velvet beans, vetch, sorgo, and sweet potatoes are grown in small patches. Cotton yields are low. The yield of corn is 15 to 30 bushels, and of oats 20 to 30 bushels per acre. Rye, cowpeas, sorgo, and sweet potatoes give good returns, and vegetables do exceptionally well. Very little stock is kept and few houses are located on this type of land.

This soil is handled in much the same manner as the Norfolk sand. The fertilizer practice is the same as on the Norfolk sandy loam. The soil warms up early in spring and is easily cultivated. More legumes should be grown to lessen the expenditure for nitrogen fertilizers. This soil is well suited to the production of truck crops, such as cucumbers, potatoes, lettuce, cabbage, beans, peas, onions, and melons, and can be used as well for the production of bright tobacco.

RUSTON SANDY LOAM

The soil of the Ruston sandy loam is a light-gray loamy sand, passing at 5 to 7 inches into a yellowish-brown to brownish-yellow mellow sandy loam. The subsoil, appearing at 10 to 18 inches, consists of a reddish-yellow or yellowish-brown friable sandy clay with deep-red mottling in the lower part of the 3-foot profile.

In many places, especially upon knolls, this type is shallow, and has a reddish-brown sandy loam surface soil, 4 or 5 inches deep, passing into a yellowish-red sandy loam which in turn grades into a yellowish-red or dull-red sandy clay, somewhat streaked or mottled with yellow at lower depths. The soil of these spots generally carries brown and yellow iron concretions on the surface and mixed with the soil and subsoil. Often in the same field, owing to variation in depth of the sand material, the color varies from gray to brown. The substratum is yellowish red to red, mottled with yellow, or yellow mottled with red. Small local areas are found in which there is a noticeable

[8] A few scattered areas occurring along the Orangeburg County line that were mapped as Ruston sand and Orangeburg sand in the Orangeburg County survey were included with the loamy sand in the survey of Lexington County.

admixture of coarse sand and others have some rounded quartz gravel and iron concretions. Such gravelly areas are shown on the map by symbols.

The Ruston sandy loam is developed mainly in scattered areas lying south of a line drawn through Steedman, Pelion, and Gaston. The largest lie in the vicinity of Swansea. Smaller ones are situated on the ridge between Batesburg to beyond Leesville. A few small areas are in the vicinity of Leaphart and New Brookland.

This type of soil has a fairly level to gently undulating to gently sloping surface. The drainage is internal and there is little or no erosion. Drainage is adequate, as the type usually occupies high ground and is not affected by seepage.

The Ruston sandy loam, though confined to small scattered areas, is fairly important. It covers in all, excluding its rolling phase, some 4,864 acres. About 65 per cent is cleared and used for cultivated crops. The forest on the uncleared areas is largely of longleaf pine. In some areas, noticeably upon those having a shallow soil, there is an admixture of hardwood, including white oak and red oak, roundleaf post oak, hickory, and dogwood.

The type is fairly productive, cotton, corn, oats, wheat, rye, and cowpeas, the main crops, giving good yields where properly handled. Fruits, vegetables, and other crops common to the area are grown in small patches. Cotton yields one-fourth to one-half bale per acre, corn 20 to 50 bushels, oats 30 to 60 bushels, and wheat 12 to 25 bushels.

The cultural practices, including fertilization, are essentially the same as on the Marlboro and Norfolk sandy loams. This Ruston soil holds moisture fairly well, being next to the Marlboro sandy loam in this respect. The selling price of land of the Ruston sandy loam type ranges from $50 to $250 an acre. The land may be improved for agriculture by the same means suggested for the Norfolk and Marlboro sandy loams.

Ruston sandy loam, rolling phase.—The rolling phase of the Ruston sandy loam has essentially the color and structure of the typical soil throughout the profile. The main difference is the rolling to broken topography and the consequent greater variation in the depth to the subsoil, with the attending disadvantages and generally lower agricultural value. The soil varies from a reddish-brown loamy sand, 2 inches deep, to almost a sand having a depth of 24 inches above the typical subsoil. Areas are found where there is a large quantity of waterworn quartz gravel and also iron concretions on the surface and in the soil mass, and others where the raw clay is exposed in numerous places on the steeper slopes.

The type occurs along the broken or eroded edge of the sandy loam deposits. It is extensively developed over the country south of a general line through Steedman, Pelion, and Gaston. Some scattered areas are found around the escarpment of the Norfolk sandy loam in the vicinity of Batesburg and Leesville. Owing to the position of the areas and open texture of the soil, the drainage is thorough. Much of the rainfall passes off through surface channels of the streams which ramify all parts of the type. Erosion is fairly active.

This phase is not an important soil. Only a small proportion of it is used for crop production. Most of the rest is in the condition of cut-over land. At one time this was covered with a good growth

of longleaf pine, but now there is only a scattering of pine, with which is mixed white and red oak, round-leaf post oak, a little blackjack oak, hickory, and dogwood. In places the underbrush is fairly thick; in others the woods are open. Only occasional bunches of native grasses appear in these forests.

The cleared areas of the phase are used for the same crops as the typical soil but the yields are lower. The land in places is used as a range for cattle.

Terracing is generally practiced to prevent washing, but where the soil is cultivated large quantities of sand have been removed from the hillsides and carried down into the valleys and depressions.

The market value of the land of the rolling phase is much lower than that of the typical Ruston sandy loam, ranging from $10 to $50 an acre.

The same crops and cultural methods are recommended for this soil as for the main type. There are a number of badly eroded areas that should be reforested with longleaf pine. Cover crops should be grown more generally to protect the soil in winter, and more coarse plant growth turned under both to supply organic matter and to improve the soil by making it more coherent. The roughest and most broken and rolling areas should be allowed to reforest.

ORANGEBURG SANDY LOAM

The Orangeburg sandy loam in this area is not uniform in color or depth of soil. Where typically developed, the surface soil is a grayish-brown loamy sand changing at 5 to 7 inches to a yellowish-brown loamy sand. At 8 to 14 inches there is a layer of yellowish-red mellow sandy loam 3 to 6 inches thick, and below this appears the subsoil proper, consisting of a bright-red, friable, slightly compact sandy clay. The average depth to the subsoil is about 15 inches. Several of the areas mapped, particularly one east of Leaphart on the Richland County line, have a soil of reddish-brown loam or sandy loam 4 to 5 inches deep, underlain by a red, heavy, sandy clay loam or sandy clay which extends to 3 feet or more.[9]

Small areas lying east of Leesville and also on the Orangeburg County line have a shallow soil of grayish-brown to reddish-brown loamy sand overlying a few inches of reddish-brown or yellowish-red sandy loam, below which is the typical Orangeburg subsoil. These areas usually have a considerable quantity of small iron concretions on the surface. Most of the substratum is of a lighter red color than the subsoil and contains numerous interbedded gravel strata. In places, notably east of Leesville, the deep substratum is mottled or streaked with yellow or white.

The Orangeburg sandy loam is widely scattered, occurring near New Brookland and Leaphart in the eastern part, near Swansea in the southern part, and in the vicinity of Batesburg in the western part of the county. The areas are small and the total extent of the type is only 1,728 acres.

The topography ranges from fairly level to gently undulating or rolling. Both surface drainage and underdrainage are excellent.

[9] These areas are mapped in the Richland County survey as Greenville clay loam.

The Orangeburg sandy loam is a strong soil, but owing to its small acreage it is not an important type in the agriculture of the county. From 80 to 85 per cent is cleared and under cultivation. Cotton is the leading crop. Corn, oats, wheat, rye, and cowpeas are other crops of some importance. Crimson clover, vetch, velvet beans, sorgo, and sweet potatoes are grown in small patches. The yields of all crops are good under normal conditions. The same methods of farming are followed upon this type as upon the Norfolk, Marlboro, and Ruston sandy loams. The selling price of the Orangeburg sandy loam ranges from $50 to $150 an acre.

HOFFMAN COARSE SANDY LOAM

The soil of the Hoffman coarse sandy loam in forested areas is a dark-gray loamy coarse sand, 3 to 5 inches deep, passing into a grayish-yellow loamy sand which extends to depths of 6 to 12 inches. This is underlain normally by a transition layer, 2 to 4 inches thick, of light-yellow coarse sandy loam or coarse sandy clay loam. Below this the subsoil proper appears. It also consists of differing strata. To about 2 feet below the surface there is a mottled red, pink, and yellow friable coarse sandy clay; below this, after a rather abrupt change, there comes a mottled red, pink, and white pipe clay, carrying very little gritty material. This clay is comparatively brittle when dry and sticky and plastic when wet and is fairly impervious to water. This may extend to depths of several feet, but the substratum usually is of the same general character as the upper subsoil—a mottled red, yellow, gray, and white coarse sandy clay, more or less compact but friable. Included with the coarse sandy loam are a few small areas of a soil of sandy loam texture. These are located near Hall and Samaria.

Hoffman coarse sandy loam is developed over the northern part of the Coastal Plain belt, in the region lying south of a line through Batesburg, Lexington, and New Brookland and north of a line through Steedman, Pelion, and Gaston. In this region generally the material giving the Hoffman is the basal material beneath sand deposits. The Hoffman coarse sandy loam is found wherever the sandy surface material has been removed by erosion. Thus the type occupies the slopes at the base of the sand hills and other sandy types found in narrow strips along the streams that head back in the sand country, and is present also in basins around the headwaters of streams and extending out along the main stream courses.

The topography is dominantly rolling, steeply sloping and broken, but in some areas it is undulating to rolling. Surface drainage is adequate but the movement of the water is retarded by the impervious pipe clay stratum. The areas also are subjected to seepage water from the higher lying sand region. Numerous small intermittent drainage ways cross the type, and in places erosion is fairly active.

The type is rather extensive but is not important, only 15 to 20 per cent being cleared and used for crops. Longleaf pine mixed with some hardwoods form the growth on the uncleared part of the type. Much of the good standing timber of the county is upon this land.

Cotton, corn, and small grains (oats, wheat, and rye) are the leading crops. Some cowpeas are grown, but few other legumes. Small plots of sweet potatoes, sorgo, and garden vegetables are planted on

most of the farms. This soil is not as productive as the other upland soils. Its general situation and the rough topography of the surrounding sand-hill country have been against its development. The yields of cotton under weevil conditions are low. Corn yields 10 to 25 bushels per acre. The small grains also give small returns. Leguminous crops do only fairly well. Vegetables yield well where the land is heavily manured.

The Hoffman coarse sandy loam ordinarily brings $10 to $30 an acre. Some more favorably situated areas or those supporting a good stand of timber have a higher value. The same general methods for improvement are recommended as for the Norfolk sandy loam.

PORTSMOUTH SANDY LOAM

The surface soil of the Portsmouth sandy loam in forested areas consists of 8 to 10 inches of black sandy loam, containing a relatively large quantity of organic matter. Below this is a layer, 4 to 6 inches thick, of light-gray, heavy, slightly sticky sandy loam. The subsoil, normally appearing at 12 to 18 inches, consists of a light-gray mottled with yellow or yellowish-brown sticky sandy clay, extending to depths of 3 feet or more. At about 4 feet the material in places becomes drab in color. A few small areas of loam texture are included, and in places the texture is quite sandy along the margins of the areas and nearly a muck in the center.

The Portsmouth sandy loam occurs in small depressions. The largest areas lie in the vicinity of Batesburg and Leesville, and small areas are scattered over the region between Summit and Pelion. It is developed upon broad, flat-topped ridges or sand flats, where it is associated with the Norfolk sandy loam or Norfolk sand. The depressions are commonly about one-fourth mile in diameter, and from 5 to 20 feet below the level of the surrounding country. The surface is level or slopes gently toward the center of the depression. There are no natural surface outlets, and the drainage is poor, water standing upon the surface during wet seasons.

About 15 per cent of this type is partly drained by ditches, but these in many places have become more or less choked with material from the banks and are ineffectual. Several of the better drained areas are cropped; others are used for pasture.

On the areas around Batesburg and Leesville the forest consists of loblolly pine and sweetgum; in the sand-hill country the black gum is the characteristic tree, and in a few areas there is some cypress. Several areas have no tree growth and seem never to have had any. These are known as savannas and the vegetation consists of reeds growing in shallow water which dries up partly or entirely in dry seasons. Such areas are valuable for grazing. Corn and oats were the only crops seen on this land during the survey. Both crops give good yields in favorable seasons.

This soil is not valued very highly for farming in its natural state. The cost of drainage is high, and it is rarely reclaimed except where it is drained for sanitary reasons near towns. The selling price is governed largely by the surrounding land.

When drained this soil is well suited to the production of corn and oats and such truck crops as strawberries, onions, lettuce, cabbage, and celery.

WICKHAM FINE SANDY LOAM

The soil of the Wickham fine sandy loam is a light-brown, mellow, fine sandy loam, 5 or 6 inches deep, passing into a brownish-yellow fine sandy loam, which extends to 10 or 12 inches. The subsoil is a light-red, firm but friable clay, slightly mottled or streaked with yellow. Spots along the breaks, where the surface material has been eroded and where better drainage has obtained, have a reddish-brown soil and red subsoil. In small swales within the type the surface soil is gray and the subsoil yellow to yellowish red. On some of the small terraces the texture is a medium sandy loam, the surface soil has a reddish-brown color, and the subsoil is a deep red. Areas of this description lie 1½ miles and 4 miles south of Cayce.

Wickham fine sandy loam is developed on terraces along the streams that head in the Piedmont and gather most of their sediments from Cecil soils. The terraces represent earlier flood plains of the streams. They now stand from 5 to 25 feet above normal stream level and well above overflow. The topography is level to undulating. The drainage is adequate, except in a few swales and depressions.

The largest areas lie on the Congaree River terraces south of Cayce. Smaller areas are mapped west of Leaphart and at the mouth of Bear Creek on terraces of the Saluda River. There is only a little more than 1 square mile of the Wickham fine sandy loam in the county. It is a good soil and fully 75 per cent of it is under cultivation. A second-growth forest of water oak, sweetgum, and other hardwood trees and shortleaf pine covers the uncleared areas. The leading crops are cotton, corn, and oats, with wheat, rye, sorgo, and cowpeas grown on small patches. Cotton yields, owing to injury by the boll weevil, are low. Corn returns 20 to 50 bushels and oats 20 to 40 bushels per acre.

The soil is naturally productive. It is easy to till, and is fairly retentive of moisture. Most of the land is farmed by tenants and little effort is made to build it up. It needs more organic matter, which in the absence of manures may best be supplied by turning under green-manure crops, preferably legumes. Deeper plowing, more thorough cultivation, and the rotation of crops would all tend to improve the yields.

ALTAVISTA FINE SANDY LOAM

The soil of the Altavista fine sandy loam is a light-gray, light-textured fine sandy loam 4 to 6 inches deep, passing downward into a pale-yellow heavy fine sandy loam, only slightly compact. This extends to 10 or 12 inches, where the subsoil, a yellow, friable clay, mottled with red in the lower part, appears.

Some variations from this description occur. In low swales there is a dark-gray surface soil and the lower subsoil is mottled with drab. Such areas are not extensive. Several areas in which the subsoil is heavy and plastic and mottled with red lie on the terraces of the Congaree River south of Congaree Creek. Near Leaphart a very fine sandy loam texture is developed in places, the soil having the same color as the typical soil, but the subsoil being lighter. These various departures are not extensive enough to warrant separate mapping.

The Altavista fine sandy loam occurs as terraces along the Saluda and Congaree Rivers. Areas are situated at Leaphart and south of Cayce. They have a level to slightly undulating surface, and are fairly well drained except in the swales. They lie 10 to 25 feet above the first bottoms and therefore well above overflow.

A little more than 1 square mile of this type is mapped, and about 30 per cent of this is cleared and in cultivation. The uncleared area supports a mixed forest of shortleaf pine and hardwoods.

Corn, cotton, and small grains are the principal crops, and few other crops except sorgo and cowpeas are grown. Small areas are devoted to pasture, especially the lower or swale areas. The yields are lower than upon the Wickham fine sandy loam.

The soil is deficient in organic matter. It holds moisture well. It is easily cultivated, although it can not be plowed as soon after rains as the sandier soils. Methods similar to those suggested for the heavier upland soils should be employed to improve this soil.

KALMIA SANDY LOAM

The soil of the Kalmia sandy loam consists of 6 or 8 inches of light-gray loamy sand passing into a yellow sandy loam, mellow in structure, which extends to 12 to 20 inches. Below this is a friable yellow sandy clay extending to depths of 3 feet or more. In well-drained spots the lower part of this layer is yellowish red or faintly mottled with red. In the poorly drained areas gray mottlings occur below 30 inches. Several small areas of coarse sandy loam are mapped with this type

The Kalmia sandy loam is a terrace or second-bottom soil lying from 5 to 20 feet above the first bottoms and above overflow. It is composed of material washed from Coastal Plain soils, mainly Norfolk. The topography is fairly level to gently undulating, and drainage is well established, though almost wholly internal. Seepage water from higher ground affects it in spots. Crops rarely suffer for lack of moisture.

The largest areas lie on the back terrace of the Congaree River below the mouth of Congaree Creek, a large stream that heads in and flows through the Coastal Plain region, and also along Congaree Creek. Small scattered areas are mapped on the terraces of the North Fork Edisto River in the southwestern part of the county.

The area of this soil is small, between 4 and 5 square miles. About 45 per cent of it is cleared and cultivated. On the rest there is a growth of mixed forest of shortleaf pine and hardwoods, among which water oak and sweetgum are prominent. Native grasses make a good growth where the forest is open.

Cotton, corn, and oats are the leading crops. The yields are generally low. Some cowpeas, wheat, and rye are grown. Sorgo, potatoes, sweet potatoes, vegetables, and melons are grown in small patches. The forested part of the type is used for grazing.

This soil is deficient in organic matter and is usually acid in character. The cultural methods and fertilizer practices are the same as upon the Norfolk sandy loam.

The selling price of land of this type ranges from $20 to $50 an acre, with some better situated and developed tracts higher.

MYATT SANDY LOAM

The surface soil of the Myatt sandy loam is a dark to almost black heavy loamy sand, 6 to 10 inches deep, resting on a light gray sandy clay, which changes at 15 to 18 inches into a very light gray sandy clay mottled with yellowish brown. This layer extends to 3 feet or more. The subsoil is smooth but friable when dry and sticky when wet.

The type occupies low terraces which in places are partly covered with water at times, though lying above normal overflows. Like the Kalmia, the type is derived from Coastal Plain material, reworked and deposited by the streams when they flowed at higher levels. The topography is level or nearly so, and the areas are poorly drained.

The largest areas occur on the back terrace of the Congaree River and along Congaree Creek. The type is also developed on Black Creek north of Rambo Bridge, and in scattered areas on the North Fork Edisto River between the mouth of Black Creek and White Bluff Bridge.

This soil is not used for crop production, but most of it is inclosed and used as pasture. It furnishes fairly good grazing. The forest is largely like that on the Kalmia sandy loam, but on some areas the growth is chiefly juniper and black gum, with a dense undergrowth of bay and laurel.

This land must be drained before it can be used successfully for crop production. This would not be difficult. When properly reclaimed the land will be suited for the production of corn, oats, and grasses.

AUGUSTA SANDY LOAM

The surface soil of the Augusta sandy loam is a gray loamy sand to sandy loam, changing at 5 to 7 inches into a yellowish heavy sandy loam and this rather quickly into the true subsoil. Beginning as a pink mottled with red, yellow, brown, and gray clay or sandy clay, compact, smooth, and brittle, the subsoil passes at about 20 to 30 inches into a less compact and more friable sandy clay mottled like the material above. The substratum is like the lower subsoil, but may contain strata of pure clay that is invariably mottled with white. Upon the breaks the subsoil is inclined to have bright-red mottles or to be reddish yellow in color. In poorly drained spots the surface soil is very dark gray and the subsoil mottling is faint red and drab.

The Augusta sandy loam occurs on terraces lying 10 to 20 feet above the first bottom. The surface is level to gently undulating or gently sloping. Swales exist in many places next to the hills. Surface drainage is fairly well established, but the impervious nature of the subsoil retards the internal drainage. Seepage water from the higher country often moves along the surface of the subsoil, and in dry seasons crops receive much of their moisture supply in this way. Most of this soil lies well above overflow, but a part of it is flooded during high stages of the streams.

Areas of this type are situated mainly along the terraces of Black Creek and the North Fork of Edisto River and its tributaries west of Black Creek. Only 2,368 acres of this soil are mapped. It is important, considering the small acreage, and about 60 to 70 per cent is cleared and under cultivation. The rest carries a mixed forest like that on the Kalmia sandy loam.

Cotton always has been the leading crop, but the presence of the boll weevil is causing a reduction of the acreage. Corn is the crop of second importance. Oats, wheat, and cowpeas are grown on a fair acreage, and rye, sorgo, and sweet potatoes occupy small patches. The yields are good in favorable seasons, but are easily affected either by excess or deficiency of rainfall.

CONGAREE FINE SAND

The soil of the Congaree fine sand is a light-brown to brown fine sand, 10 or 12 inches deep. The material becomes slightly lighter in color with depth, but the texture remains uniform to 3 feet. Both the soil and subsoil are loose and incoherent. The type varies from place to place, as is to be expected in soils of alluvial origin. In places the surface soil tends toward a loamy fine sand; in others it is a gray medium sand. The type occurs as a strip one-eighth to one-fourth mile wide along the banks of the large rivers that head in the Piedmont Plateau. It lies in most places 10 to 20 feet above stream level, but is subject to overflow. Areas are developed in the Saluda and Congaree River bottoms. The surface is level to undulating. In places a succession of low ridges or swales occur. The drainage is excessive.

There is less than 1 square mile of this soil in Lexington County, and about 10 to 15 per cent of it is cleared and under cultivation.

Corn is the chief crop, with some oats, rye, cowpeas, sorgo, melons, and sweet potatoes. The yields are good when not reduced by floods.

CONGAREE FINE SANDY LOAM

The surface soil of the Congaree fine sandy loam is a brown, mellow, light fine sandy loam 10 to 12 inches deep. This passes imperceptibly into a light-brown, mellow, heavy fine sandy loam to fine sandy clay, extending to a depth of 3 feet or more. Both soil and subsoil carry a noticeable quantity of mica. In places, notably along Broad River below Peak, areas included with this type are characterized by a brownish-gray loamy fine sand surface soil, 6 to 8 inches deep, passing into a yellowish-brown fine sandy loam, which rests upon a reddish-brown to reddish-yellow fairly compact but friable fine sandy clay subsoil.

The Congaree fine sandy loam is developed along the streams that receive all or practically all their drainage from Piedmont soils. It is developed along the Broad River from the Parr Shoals Dam to the mouth of Wateree Creek, covering the entire bottom with the exception of a few spots. Large areas also lie along the Congaree River south from Cayce and small areas along the Saluda River and some of its tributaries.

This is an alluvial soil lying on the higher bottom situations. The surface is fairly level to gently undulating. In places swales are developed that extend in the direction of the stream flow. Although the areas are subject to overflow, only the higher floods cover them. Both surface and internal drainage are good and the land drains very soon after the floods subside.

The Congaree fine sandy loam forms less than 1 per cent of the area of the county, or between 3 and 4 square miles. About 50 per cent of the land is cleared and used for cultivated crops. The rest is in forest, consisting of pine, water oak, sycamore, sweetgum, and willow, which is used mainly for pasture. The cultivated areas are used chiefly in growing corn, cotton, and oats. Corn yields 25 to 40 bushels per acre, cotton one-half to 1 bale when not attacked by the boll weevil, and oats 20 to 45 bushels. Damage or loss from floods is not as great as upon the other Congaree soils.

CONGAREE SILT LOAM

The surface soil of the Congaree silt loam is a rich-brown, mellow silt loam, 8 to 15 inches deep, with an average depth of 12 inches. This passes downward into a yellowish-brown to light-brown silty clay loam extending to depths of 3 feet and more. Both soil and subsoil are mellow, though the subsoil is slightly more compact, and both contain a noticeable amount of finely divided mica. The type is fairly uniform throughout its entire extent in this county, though in places the subsoil consists of interbedded strata of silt loam and fine sandy loam. In the poorly drained swales, also, surface soil is darker and the subsoil is mottled with drab.

The type has its largest developments in fairly extensive bottoms along the Congaree River south of Cayce, starting 2 miles below this place and extending nearly to the Calhoun County line. It is also mapped in scattered areas along the Saluda and Broad Rivers and along a number of creeks heading in the Piedmont region.

The type is derived from wash from the Piedmont soils, principally of the Cecil series. It occupies stream-bottom areas intermediate in elevation between the fine sandy loam and the silty clay loam. It is subject to overflow but not as deep or prolonged overflow as the latter soil. Most of the type is naturally well drained, and it contains only a few low spots or swales that need artificial drainage. The surface is level to very gently undulating.

The Congaree silt loam is the most important bottom-land soil in the county, and is more widely used for farming than any of the other alluvial types. From 65 to 75 per cent is cleared and used for crops; the rest of its area is in forest consisting of pine, water oak, sycamore, elm, willow, wild grape, and alder. This is used for pasturing cattle and hogs. Considerable cane is grown along the stream banks. The cleared areas are utilized mainly for growing corn, cotton, oats, and cowpeas. Cotton is uncertain under boll-weevil conditions. Corn yields 25 to 60 bushels per acre, or more in exceptionally favorable seasons. Oats yield 20 to 50 bushels per acre, but have a tendency to lodge. Cowpeas give heavy returns of forage. Crops are occasionally damaged by floods, and in some seasons are a total loss. Commercial fertilizers and manure are not used on this type. The soil is very retentive of moisture, crops never suffering for water even during the most severe droughts.

The type is held in large tracts and is seldom placed upon the market. It sells for $20 to $100 an acre.

The Congaree silt loam is better adapted to corn than to any other crop. It is fairly well suited to small grain, especially to oats. Oats and vetch followed by cowpeas and sorgo make a good succession of forage crops on land of this type. In other sections it produces

heavy yields of truck crops, including cabbage, potatoes, beans, beets, carrots, and onions. Dikes should be erected to minimize the loss from overflow, especially where truck crops are to be grown.

CONGAREE SILTY CLAY LOAM

The soil of the Congaree silty clay loam is a brown to reddish-brown silt loam to silty clay loam, 4 to 8 inches deep. The subsoil is a yellowish-brown silty clay that extends to a depth of 3 feet or more. The soil has a friable structure, but the subsoil is more compact. Finely divided mica is present in both soil and subsoil. The substratum is composed of beds of sand, silt, and clay. In many places below 24 inches a mottled brownish-yellow and rusty-brown color is developed and small black spots and small rounded iron concretions about the size of bird shot or coarse sand appear in the material. In poorly drained areas or lagoons, or where water stands constantly, the surface soil is dark and the subsoil is mottled with yellow and brown or drab below 12 to 18 inches.

Small areas of Wehadkee silty clay loam are included with this soil. These areas have a gray to light grayish brown surface soil, about 6 to 8 inches deep, passing downward into a mottled gray, drab, and yellow or yellowish-brown subsoil. The soil and the subsoil have nearly the same structure and texture as the Congaree silty clay loam, with the exception that the Wehadkee is slightly more compact. These areas are commonly poorly drained and support the same tree growth as the Congaree soil.

The Congaree silty clay loam is developed mainly upon the low bottoms of the Congaree River south of Cayce, in the bottoms west of Leaphart on the Saluda River, and along Crimes Creek in the northern part of the area.

The type is subject to deep and protracted floodings, and is not used for cultivated crops. It supports a growth of shortleaf pine, water oak, ash, ironwood, and wild mulberry. There is some switch cane in the undergrowth.

Artificial drainage is essential to the successful cropping of this land. Dikes would be necessary to prevent overflow and their construction would entail great expense. Land of this type formerly was used in many places for rice culture, and if drained and protected from overflow it would produce excellent crops of corn, oats, and certain truck crops, including cabbage, onions, and beans.

WEHADKEE SILT LOAM

The soil of the Wehadkee silt loam consists of about 5 inches of dark brownish gray to dark-gray silt loam, forming an upper layer, and 3 to 5 inches of light-gray or light brownish gray silt loam, forming a lower layer. At 8 to 10 inches there appears what may be termed the subsoil, a yellow or yellow and gray mottled silty clay loam to silty clay. This in most places extends to a depth of 3 feet or more, but in some places the material in the lower part of the 3-foot profile is gray or drab and a loam instead of a silty clay loam in texture. Both soil and subsoil have a compact structure. The Wehadkee silt loam differs from the Congaree silt loam not only in color but in the absence of mica. In poorly drained spots or swampy

areas the surface soil is dark and the entire soil and subsoil is mottled gray, yellow, drab, and faint brown.

The Wehadkee silt loam is confined to the creek bottoms of the streams which head in and receive most of their wash from the areas underlain by slate. The main areas of the type lie along the streams tributary to the Saluda River. It is developed in belts seldom more than one-fourth mile wide.

The topography is level to gently sloping, and the drainage on the whole is rather poorly established, though in many cases the streams have cut well-defined channels, the bottoms lying 2 to 5 feet above the normal water level. The type is subject to overflow.

The Wehadkee silt loam has a total area in the county of 4,032 acres, and only about 10 per cent of this is under cultivation. The rest supports a mixed growth similar to that on the bottom-land soils. Corn and oats are the only crops grown. They give fairly good yields without the aid of fertilizer. Crops are damaged some seasons by floods. Part of the type supports a fairly good sod of native grass and with the wooded areas is used as pasture.

The greatest need of the soil is better drainage, which can be supplied by straightening the stream courses and digging lateral ditches. The reclaimed areas should grow good corn, oats, and hay.

JOHNSTON LOAM

The surface soil of the Johnston loam is a dark-gray to black sandy loam, loam, or silt loam, the loam texture predominating. This may continue to 3 feet or more without much change, but is usually underlain at 10 to 18 inches by a subsoil of gray to dark-brown sandy loam, sand, sandy clay loam, or clay loam, in places mottled yellow or brown. The subsoil is firm and compact, sticky when wet and stiff when dry. The soil contains a quantity of organic matter and is spongy and soft when saturated, but becomes firm upon drying. As will be noted from the foregoing description, there are wide variations in the texture of the surface layer of the areas mapped as this type and even wider variations in the texture, structure, and color of the subsoil. The surface soil, however, is consistently dark, and the areas are uniformly swampy.

The Johnston loam is derived entirely from wash from Coastal Plain soils. Nearly all the streams upon which it is found have sluggish meandering currents and in many places no well-defined channels. The bottoms occupied by this type range from 200 feet to one-half mile in width. The largest and most important areas occur along the North Fork of Edisto River, on Black Creek, Congaree Creek, and Bull Swamp.

This is the most extensive of the alluvial soils, occupying 13,120 acres, or 2.6 per cent of the area of the county. It is of little present importance, as it is not farmed. The entire area is covered with a typical swamp forest growth, black gum predominating, with some loblolly pine, water oak, cypress, sycamore, sweetgum, and tupelo, and an undergrowth of briers, vines, and shrubs, mostly bay laurel. It is used as pasture for cattle and hogs.

The Johnston loam is sold in connection with adjoining types, and has little value except for its timber.

Artificial drainage is needed to develop this type for farming. This can be done by straightening the stream channels and by digging lateral ditches and ditches at the foot of the upland slopes, the latter to carry off the seepage water. The drainage of this soil can not be successfully carried on individually, but will require the concerted action of the owners along the entire stream or at least over large sections of the bottoms. When properly drained the land can be used for growing corn, oats, potatoes, and such truck crops as cabbage, lettuce, beans, and onions. It would also be valuable for hay and forage and as pasture land.

MEADOW

Under the term Meadow are grouped the soils occurring along the smaller streams, both those draining the Piedmont and the Coastal Plain soils, where the materials are so variable that no series or textural separation can readily be made.

The surface soil in such areas ranges from a silt loam to a sandy loam and includes some beds of stream wash sand and gravel. The color varies from gray to dark gray or brown. The subsoil is yellowish brown or mottled yellow, yellowish brown, gray, and drab. The drainage conditions range from good in spots to very poor and swampy.

Meadow is developed on the streams in the region south from Batesburg and Leesville, the largest areas being found along Duncan and Horsepen Creeks. It is of slight extent and little importance. Patches are cleared and used for crops or pasture. About half the cleared area is in pasture and the rest in corn and oats. A typical bottom-land forest of water-loving hardwoods covers the uncleared land.

SUMMARY

Lexington County lies in the west-central part of South Carolina and has an area of 801 square miles, or 512,640 acres. It has excellent transportation facilities, as five railroads radiate from Columbia and cross the county. Improved public roads reach nearly all parts. The climate, which is typical of the sand-hill belt, is characterized by short mild winters and long warm summers. The growing and grazing season is long, and the rainfall is ample and well distributed.

The county lies partly in the Piedmont Plateau and partly in the Coastal Plain region, and its surface ranges from level and undulating to rolling and hilly. All of the county, except strips of bottom land and a few depressions in the uplands, is naturally well drained.

There are two distinct classes of soils in the county which have different origin, color, and structural characteristics. The northern one-third comprises the so-called clay lands or red clay hills, with soils derived from underlying granite, schist, and slate rock. The southern two-thirds of the county includes a part of the sand-hill belt and here extensive areas of sand, as well as light sandy loam soils are developed, the soil materials coming from unconsolidated sedimentary deposits.

For a long time cotton has been the main crop in Lexington County, and even under boll-weevil conditions it continues to be the principal

crop. There has been, however, an increase in the acreage of corn wheat, oats, and rye since the advent of the weevil, and this acreage has been withdrawn from cotton. In addition to these staple crops, cowpeas, sorgo, sweet potatoes, and garden vegetables are grown. Some commercial orchards of peaches are established.

The county offers excellent opportunities for the reseeding of longleaf pine on an extensive area of sandy plains and sand hills. There is a good chance for extending the trucking industry, and the growing of a large variety of crops. Among the fruits, dewberries and Scuppernong grapes, as well as peaches, can be successfully produced.

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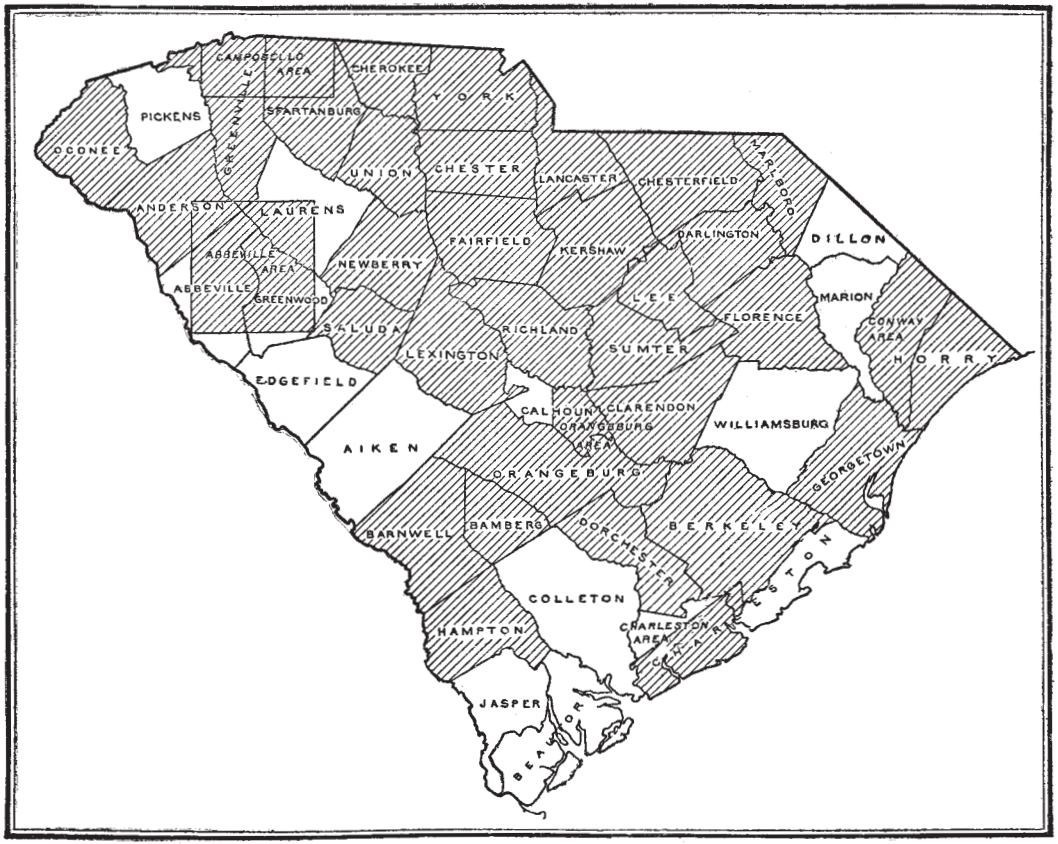

Areas surveyed in South Carolina, shown by shading

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