U. S. DEPARTMENT OF AGRICULTURE.

BUREAU OF SOILS—MILTON WHITNEY, Chief.

SOIL SURVEY OF MARLBORO COUNTY, SOUTH CAROLINA.

BY

CORNELIUS VAN DUYNE, IN CHARGE, W. E. McLENDON, W. J. LATIMER, AND T. M. MORRISON.

W. EDWARD HEARN, INSPECTOR, SOUTHERN DIVISION.

[Advance Sheets—Field Operations of the Bureau of Soils, 1917.]

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1919

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., November 13, 1918.

SIR: In the extension of the Soil Survey in South Carolina a survey of Marlboro County was carried to completion during the field season of 1917.

I have the honor to transmit herewith the manuscript report and map covering this survey, and to recommend their publication as advance sheets of Field Operations of the Bureau of Soils for 1917, as authorized by law.

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

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

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SOIL SURVEY OF MARLBORO COUNTY, SOUTH CAROLINA.

By CORNELIUS VAN DUYNE, In Charge, W. E. McLENDON, W. J. LATIMER, and T. M. MORRISON.—Area Inspected by W. EDWARD HEARN.

DESCRIPTION OF THE AREA.

Marlboro County, S. C., is situated in the northeastern part of the State, and adjoins North Carolina on the north and northeast. The county has a length of approximately 33 miles north and south, and a width of 20 miles east and west. Its area is 519 square miles, or 332,160 acres.

Marlboro County includes parts of five topographic belts, one of which, the Sand Hill belt, is divided into two areas differing in the details of topography. They are (1) the Marlboro Plain, (2) the Sandhill region, including (*a*) the Pegues Plateau, (3) the lower Coastal Plain, or Flatwoods, (4) the River Terraces, and (5) the Flood Plains of the rivers. The distribution of these several belts is shown on the accompanying sketch map, figure 2. These various topographic belts constitute a series of descending terracelike plains, the Sand Hill belt being the highest and the River Flood Plain belts being the lowest. The range in elevation is from 140 to more than 300 feet above sea level. In addition to their difference in elevation they differ in degree of dissection, the Sandhill section being most dissected and the River Flood Plains the least. The Pegues Plateau is undissected, but on account of the fact that it seems to be merely a fragment of the original belt that has been converted by erosion into the Sandhills, it is included as a part of the latter into which erosion has not yet been extended.

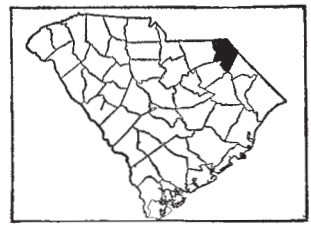
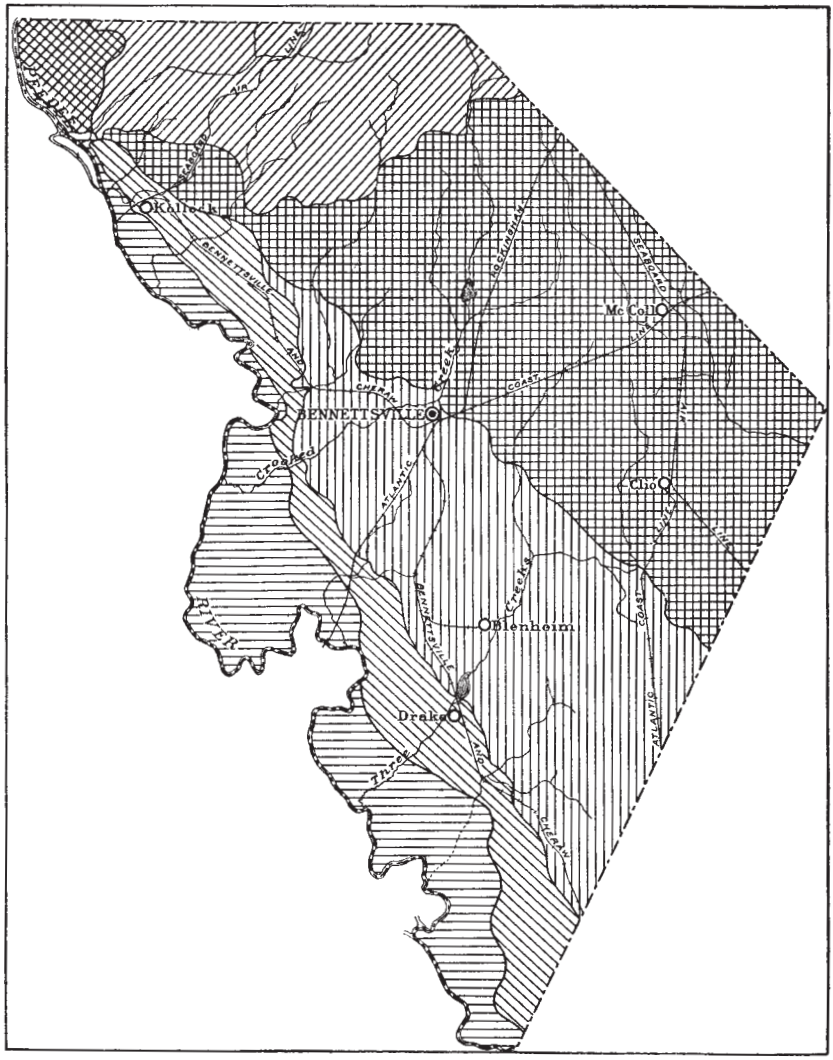


FIG. 1.—Sketch map showing location of the Marlboro County area, South Carolina.

The Marlboro Plain occupies about one-third the area of the county. It is a broadly undulating to level plain, sloping gently to the south and east, into which the few streams have cut valleys 50 feet or less in depth. The surface is marked by numerous depressions.

The Sandhill division covers approximately 80 square miles in the northern part of the county. It lies higher than the Marlboro Plain. The topography ranges from broadly undulating to rolling and hilly, with moderately wide divides.

The Pegues Plateau is the highest part of the county. It consists of a level and undulating area bordered by steep sandy or gravelly slopes. This plateau represents the oldest Coastal Plain deposits.



DISTRICT OF TOPOGRAPHIC TYPES IN MARLBORO COUNTY S.C.

FIG. 2.—Sketch map showing physiographic divisions of Marlboro County.

The Lower Coastal Plain or Flatwoods embraces approximately 115 square miles. It lies distinctly lower than the Upper Coastal Plain to the north and east, and 25 feet or more above the river ter-

race on the opposite side. The surface is distinctly level. The streams are few in number and flow in comparatively shallow and narrow valleys. Depressions are much less numerous than on the Marlboro Plain.

The river-terrace division is practically continuous along the western boundary of the county. It ranges in width from one-half mile to upward of 3 miles, attaining its greatest width near Everett, Drake, and the Dillon County line. The terrace boundaries, both on the upland and on the first-bottom side, are well defined.

At least 90 per cent of the county drains directly into the Peedee River. The extreme eastern part drains into it through the Little Peedee River. The Sandhill section is well drained. The run-off here is very slight. The streams in general have a steeper gradient and deeper and wider valleys than in any other section of the county. In the Marlboro Plain there are comparatively few streams, and broad, flat, to very gently undulating interstream areas are not connected with drainage courses. The streams have comparatively narrow bottoms, which lie 10 to 50 feet below the surrounding country. Their currents are sluggish and their courses meandering. In the Flatwoods section the streams are few. They rise largely in the higher part of the county and have few or no tributaries. Extensive flat areas, more or less poorly drained, occur between these streams. For the most part the streams flow sluggishly only a few feet below the general level of the upland. The only streams traversing the river terraces are those from the uplands, few, if any, originating in the terrace area itself. In the first bottoms the drainage is mainly by intermittent, sluggish sloughs. Near the river and on the slight rises the drainage is fairly adequate, except during overflows, but the remainder of the bottom is very poorly drained.

Marlboro County was established in 1785. The earliest recorded settlement dates from 1736, when Welsh colonists landed not far from the present site of the Society Hill Ferry in what is now known as Welsh Neck. The Peedee River afforded the only means of transportation and largely determined the location and extent of early settlement, which later spread quickly over the more accessible parts of the county. People from the English colonies in Virginia comprised a large proportion of the early settlers, with many French Huguenots and Scotch. The present white population consists largely of descendants of these pioneers of this and adjoining counties. The colored population represents more than one-half the total.

The county is unequally settled. The Marlboro Plain, the Pegues Plateau, and the western part of the Flatwoods section are the most thickly populated, followed by the Sandhill section, the remainder of the Flatwoods, and the river terrace divisions. Only a few families live in the first bottoms. The slow but steady increase in population

from 20,598 in 1880 to 23,500 in 1890, 27,639 in 1900, and 28,543 in 1910 is typical of an old-settled agricultural country. Except the population of Bennettsville, all the population, 91.5 per cent of the total, or an average of 55 persons per square mile, is classed as rural.

Bennettsville, the county seat, with a population of 2,646 in 1910, is the largest town. It is centrally located, with a public-road system radiating in all directions. Bennettsville is the commercial, marketing, and transportation center of the county. It is mainly a residential town, but has one cotton mill and an oil mill.

McColl, the second largest town, is located at the junction of the Atlantic Coast Line and the Seaboard Air Line Railways in the eastern part of the county. This town has three cotton mills, and is the commercial and shipping center for a considerable part of the county. Clio, the third town in size, is located in the eastern part of the county on the same railway lines. It is a locally important trading and shipping center. Blenheim, in the south-central part of the county, is also a trading center of local importance. Drake is mainly a sawmill town.

The county has good railroad facilities, all sections being within 10 miles of a shipping point. The Peedee River is navigable to Cheraw, in Chesterfield County, during the greater part of the year. The use of this stream has gradually decreased, and at present little freight is handled on it.

The county has a fairly extensive system of moderately well kept sand-clay roads, and these are constantly being extended and improved. The main roads radiating from Bennettsville, McColl, and Clio are the most improved. As a rule the roads in the distant parts of the county, especially in the Sandhill region, are not as good as in the central part. The roads on the river terrace and in the first bottoms are given little attention. Secondary or settlement roads are numerous. Bridges span all the creeks at the road crossings. There is a free bridge across the Peedee River near Cheraw. The Society Hill Ferry across the same river affords connection with Society Hill and other points west of the river.

Local and long-distance telephone service reaches all the towns and some of the farming sections. Practically all parts of the county are served by rural mail delivery routes. The county has a fairly good school system. Churches are numerous.

Cotton, the only important money crop, is marketed locally through cotton brokers, merchants, and other agencies. Local mills afford a market for only a small part of the crop, and the remainder is shipped to distant points. By far the greater part of the crop is sold either in advance of picking or as soon as picked. Local oil mills provide a market for part of the cottonseed.

CLIMATE.

The accompanying table is compiled from the records of the Weather Bureau station at Cheraw, in Chesterfield County, where the climatic conditions are quite similar to those prevailing in Marlboro County. The elevation of this station is 144 feet above sea level. The table gives the normal monthly, seasonal, and annual temperature and precipitation, and also the precipitation for the wettest and driest years recorded during a period of 29 years.

Normal monthly, seasonal, and annual temperature and precipitation at Cheraw, Chesterfield County.

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year (1890).	Total amount for the wettest year (1901).
	°F.	°F.	°F.	*Inches.*	*Inches.*	*Inches.*
December	44.1	78	8	3.26	1.96	4.66
January	43.3	80	3	2.82	1.27	3.10
February	42.5	82	—9	4.32	1.30	1.91
Winter	43.3	82	—9	10.40	4.53	9.67
March	53.1	93	16	3.72	3.64	3.80
April	60.9	94	28	2.78	2.09	4.51
May	70.7	103	36	3.57	4.13	10.19
Spring	61.8	103	16	10.07	9.86	18.50
June	77.3	104	41	5.36	.93	9.70
July	79.9	104	51	5.78	5.61	6.20
August	78.7	103	52	6.71	6.06	12.25
Summer	78.6	104	41	17.85	12.60	28.15
September	73.3	101	35	3.62	3.85	8.40
October	61.5	93	26	2.85	3.20	.18
November	52.1	90	14	2.19	.65	.61
Fall	62.3	101	14	8.66	7.70	9.19
Year	61.5	104	—9	46.98	34.69	65.51

The winter season is comparatively short and mild, but rather sudden changes and brief periods of moderately cold weather occur occasionally. The ground never remains frozen for more than a few days at a time, and in some years there is no snowfall. The winter mean is 43.3° F. The lowest temperature on record is —9° F. The summers are long and hot, with a mean temperature of 78.6° F. and a maximum of 104° F. Temperatures exceeding 100° F. are reported for the months of May to September, inclusive. The mean temperatures of the spring and fall are 61.8° F. and 62.3° F., respectively.

The mean annual precipitation is 46.98 inches, nearly two-thirds of which falls during the months of June, July, and August. The remainder is rather evenly distributed between the winter, spring, and fall. The recorded range in precipation is from 34.69 inches in 1890, the driest year, to 65.51 inches in 1901, the wettest year.

The average date of the last killing frost in the spring is April 1 and of the first in the fall November 3, giving an average growing season of 216 days. The date of the latest killing frost in the spring on record is April 24 and that of the earliest in the fall October 12.

The climatic conditions permit a wide range in the character of farming and in the variety of crops grown. Farming operations may be carried on uninterruptedly throughout the year. There are frequent departures from normal in temperature and precipitation, but the variations are seldom of sufficient extent to cause more than a partial failure of some one crop.

AGRICULTURE.

The early settlement and agricultural development of Marlboro County followed the course common to all sections of the Coastal Plain. The county was originally forested and the rivers afforded the only means of transportation. The clearings were necessarily small and scattered. Few of the earliest settlers were farmers. The first attempts at farming were made in the river bottom in what is now known as Welsh Neck. With permanent settlement agriculture began to make some progress. The lack of markets and transportation facilities made it necessary to grow only the supplies needed for home use. Small clearings were seeded to wheat and corn. As pasturage was abundant and the mast excellent, live-stock raising early assumed some importance, and bacon was one of the first products exported. As the transportation facilities improved and markets were provided, farming operations began to expand. The production of indigo was fairly important as long as the English Government provided a bounty. Cotton growing assumed importance near the end of the eighteenth century and progressed so rapidly that by the middle of the next century it was the chief crop. As it increased in importance, other crops and the live-stock industry declined. During the Civil War and immediately thereafter agriculture passed through a period of demoralization, and as it emerged assumed more or less the character of the present system.

In the table below are shown the acreage and production of the three principal crops at the last four census periods:

Acreage and production of the principal crops.

Year.	Cotton.		Corn.		Oats.		All other crops.
	Acres.	*Bales.*	*Acres.*	*Bushels.*	*Acres.*	*Bushels.*	*Acres.*
1880	41,251	23,785	33,773	338,527	4,727	63,180	7,018
1890	58,836	32,306	29,702	370,274	5,916	80,015	6,650
1900	57,491	37,881	35,486	474,340	7,541	127,250	9,668
1910	86,019	74,572	28,551	654,602	6,805	170,636	7,764

The following table shows the relative importance of the different crops and animal products for the year 1909, according to the census returns of 1910:

Value of crops and animal products, 1909.

Product.	Value.	Relative value.
	Dollars.	*Per cent.*
Cereals	752,216	11.2
Other grains and seeds	15,234	.2
Hay and forage crops	42,889	.6
Vegetables	137,451	2.0
Fruits and nuts	30,989	.5
All other crops (cotton)	5,412,195	80.7
	6,390,974	.....
Animals sold or slaughtered	168,106	2.6
Dairy products, including home use	32,357	.5
Poultry and eggs	109,856	1.7
Wool	27	.....
	310,346	.....
Total value from all sources	6,701,320	.....

Marlboro County is one of the leading cotton counties of the State. In 1909 there were 86,019 acres in cotton, producing 74,572 bales. The ginners' report gives the 1911 production of 75,000 bales, which is the maximum so far recorded. In 1915 the production fell to 50,720 bales and in 1916 to 34,777 bales. A 10-year average is approximately 60,000 bales. Cotton is planted on at least three-fourths of the cultivated area, and it is the chief crop on practically every farm. The average yield for the county is about three-fourths bale per acre, in comparison with the State average of approximately one-half bale per acre. Cotton is produced most successfully on the sandy loams of the Marlboro, Orangeburg, Greenville, Ruston, and Norfolk series, and on the well-drained soils of the river terraces. Both long and short staple varieties are grown, proportionately more of the former than in other counties of the State. The leading

short-staple varieties are, in order of importance, Herndon Five Lock (native of Marlboro County), Cleveland Big Boll, Cook, Wanamaker's Improved, and Texas Wool. The chief varieties of long-staple cotton are the Webber and Rogers Keenan. Cotton follows either cotton, corn, or cowpeas, with no definite system of rotation. The present fertilizer practice in growing cotton, modified in the last three years by the scarcity and high price of potash, is to use about 600 pounds of an 8–4–1 mixture and 150 pounds of nitrate of soda per acre. Formerly the applications ran as high as 1,200 to 1,500 pounds. About two-thirds of the fertilizer is applied at the time of planting and the remaining one-third about June 15. Cotton is picked by hand at the prevailing price of 50 cents a hundred pounds and is hauled to local gins, which charge $2.50 a bale for ginning.

Corn is the second crop in importance. The acreage devoted to corn exceeds that used for all other crops except cotton. In 1909 corn was planted on 28,551 acres, 22 per cent of the cultivated area, and produced 654,602 bushels, or approximately 23 bushels per acre.

It is estimated that there has since been a decrease in the acreage of corn until the present season (1917), when the total may be about the same as in 1909. Corn is grown more largely on farms operated by owners than on tenanted farms. The fields are usually small and with few exceptions the farmers do not produce enough corn for home use, so that large quantities are imported into the county. Corn not only supplies grain and roughage for all farm stock, but also furnishes part of the breadstuff. The ruling high price of corn is causing the farmers to plant an increased acreage of the crop and to give it greater attention. As a rule corn follows either cotton or corn. The Williamson method, with modifications to suit the local conditions, is generally followed. From 400 to 500 pounds of fertilizer is used per acre, 200 of which is applied in the rows at the time of planting and the remainder at the side of the rows after the corn has attained some size. Cottonseed meal is an important part of the mixture used for corn. The yield per acre is about 20 bushels, or slightly higher than the State average of approximately 18 bushels. The varieties planted are mainly local in reputation and include principally the Marlboro Prolific, Williamson's Improved, Stanton's Improved, and Fletcher's Improved. Early Yellow Dent is used for very early and late planting. Only a few farmers use care in the selection of seed. Corn is given rather frequent shallow cultivation. Some farmers sow cowpeas at the time of the last cultivation. The greater part of the corn crop is harvested by pulling the ears. The fodder is stripped and stored in bundles for forage, and the stalks are left standing in the fields.

Oats are probably the most important of the small-grain crops. The area in oats in 1909 was 6,805 acres, or about 5 per cent of the cultivated area, and the production was 170,636 bushels. Oats are commonly grown on soils whose natural drainage is rather poor and largely on the artificially drained depressions of the uplands. The crop is usually sowed broadcast or in drills in October or November, without fertilizer. About 150 pounds of nitrate of soda per acre is applied early in the spring. Rust-resisting varieties are grown, as the prevention of rust is the chief problem. The yields range from 20 to 60 bushels per acre, with an average of about 28 bushels. A large part of the crop is fed in the bundle. When cut for hay it is usually followed by cowpeas. In the last year or two more attention has been given to the production of oats.

Wheat and rye are the only other cereals grown. Less than 250 acres were reported in these crops in 1909, but the present acreage is several times larger. Wheat is usually sowed in November and 150 pounds of nitrate of soda per acre is applied about March 1. In addition some stable manure is used. Well-drained upland soils are chosen for wheat. The yields range from 8 to 28 bushels per acre, with an average of about 18 bushels. The greater part of the crop is thrashed and ground at local mills. The county imports large quantities of wheat products. Wheat and rye are grown to some extent between cotton rows as cover crops. Abruzzi is the chief variety of rye grown. The greater part of the crop is thrashed, giving yields of 15 to 25 bushels per acre.

In 1909 there were 2,784 acres devoted to cowpeas, from which 7,741 bushels of seed were gathered. By far the greater part of this crop is cut for hay, which runs from 1,500 to 3,000 pounds per acre. There are several methods of seeding the crop, among which are broadcasting after oats, wheat, or rye, and seeding in drills or broadcast between rows of corn at the last cultivation. The principal varieties of cowpeas grown are the Cotton Patch (local), Whippoorwill, and New Era. Many farmers are recognizing the feeding value and soil-improving qualities of this crop.

There were 2,592 acres in hay and forage crops in 1909, with a production of 2,309 tons. Grains cut green for hay represented 2,124 acres. Only 295 acres of tame grasses were reported. Although these crops are supplemented by corn fodder, large quantities of hay and feed are imported from outside sources. Among the tame grasses the most important are Bermuda grass, crimson clover, red clover, and alfalfa. In 1917 there were nearly 100 acres of the latter crop, which is being successfully grown by a number of farmers. Careful preparation of the seed bed, good manure, and medium to heavy applications of lime and stable manure are necessary. In-

noculation either by culture or by soil is also practiced. From four to five cuttings are obtained, with yields of upward of 1 ton per acre to the cutting.

In 1909 sweet potatoes were grown on 826 acres, producing 97,494 bushels, or approximately 115 bushels per acre. The plantings of this crop are always small. It is grown mainly for home use, the surplus being sold in the local markets. Ninety-two acres of Irish potatoes, producing 11,466 bushels, were reported in 1909. This crop is also grown in small patches for home use. The growing of potatoes for the early northern market is a developing industry in the vicinity of Clio. The crop is planted as early as the climate permits, with applications of 1,000 to 1,500 pounds of fertilizer per acre, and cotton is usually planted between the rows. From 40 to 50 barrels per acre is an average yield. The potatoes are dug late in May or early in June. Irish Cobbler is the favorite variety. Lookout Mountain is planted for the fall crop.

Less than 100 acres of sorghum were reported in 1909. Practically all of the crop is used for making sirup for home use. Nine acres of tobacco were grown in 1909 in the southern part of the county. Peanuts, velvet beans, and soy beans are grown to a slight extent. Garden vegetables are produced for use at home.

Cantaloupes for northern markets are being grown this year (1917) on about 600 acres. They are usually contracted for in advance and are shipped from the latter part of June to the 1st of July. The Rockyford is the chief variety. Two hundred and fifty crates per acre is an average yield. From 1,000 to 1,500 pounds of fertilizer per acre is applied at the time of planting. The rows are set 5½ feet apart, with the plants 18 inches apart in the rows. The crop is usually followed by cowpeas or soy beans.

There were 20,442 peach trees reported in 1909, including a few acres of young commercial orchards, and 6,640 apple trees, entirely in family orchards. Grapes, chiefly Scuppernong, to the number of 1,600 vines were reported in 1909. There were 721 nut trees, of which 611 were pecan. The number of pecan trees is greater at the present time, but pecan growing is not a specialized industry in any section of the county. The sandy loams of the Marlboro, Orangeburg, and Ruston series seem well adapted to the pecan.

Less than 5 per cent of the total value of all farm income in 1909 was from live-stock sources. Animals sold or slaughtered amounted in value to $168,106, representing the value of 43 calves, 693 other cattle, 8,180 hogs, and 31 sheep and goats. The meat products are for the most part consumed on the farms, but a few farmers have a surplus to sell. The county imports large quantities of meat products. The value of the dairy products in 1909, excluding home use, is given as $32,357. There were 1,938 dairy cows on farms in that

year. On only a few farms is dairying the chief source of income, and on only a small number is it even an accessory source of income. On many farms not enough dairy products are produced to supply the needs of the home. The colored tenant rarely has a cow. In general, live-stock farming in Marlboro County is confined to the raising of a few hogs and cattle by farmers who have access to large areas of unimproved land as free range, especially in the river bottoms. Hogs and cattle are left to shift for themselves, especially in the summer. The sale of poultry and eggs is a source of income on a few farms, the value of these products in 1909 amounting to $109,856.

The prevailing one-crop and tenant systems of farming make it impracticable to restrict the use of the different soils to the crops to which they are best adapted, but there is some recognition of the adaptation of soil types to certain crops. This recognition is more general than the distribution of the crops would seem to indicate. It is recognized that cotton does best where the depth to clay does not exceed 12 inches and that the long-staple varieties can not be profitably grown except where the sandy mantle is fairly shallow. Corn is quite frequently planted on deep, sandy soils where cotton would not be very successful. Wheat is always grown on well-drained soils, and oats usually on land having poor natural drainage.

In 1910 the average value of all farm property per farm was $4,279, of which the land represented 76.8 per cent, buildings 12.9 per cent, implements 3 per cent, and domestic animals 7.4 per cent. The farm houses range all the way from small and in poor condition to large and well kept. Forage crops are stacked outdoors and hauled to the barns as needed, and frequently the farm stock and machinery are inadequately housed. It is a common practice to leave the cotton bales outdoors. Farms are seldom fenced, and crops are frequently planted all around the farm buildings. The supply of machinery seems inadequate, even for the prevailing type of farming. Much of it is of the one-horse type. Labor-saving machinery has been adopted by comparatively few farmers. The greater part of the work stock consists of mules imported from the western markets, but horses are used to a small extent. The grade of work stock ranges from poor to good. Tractors are used on only two or three farms.

Crops are not generally rotated, although many of the progressive farmers recognize the need and value of a rotation. Cotton is frequently grown on the same field year after year, and in order to maintain the yields there is an increasing expenditure for fertilizer. Even some of the progressive farmers have considered it more profitable to grow cotton and to buy feed for the farm stock than to grow subsistence crops. Some farmers follow corn with cotton for two years and then return to corn, but there is such a

great difference in the acreage devoted to the two crops that this practice does not amount to much of a rotation. Others plant cowpeas in the corn at the last cultivation. Oats and wheat are frequently followed by cowpeas the same season.

The expenditure for fertilizers in 1909 was $1,020,805, or an average of $314.87 for each of 3,242 farms reporting. The expenditure was more than $700,000 over that reported in 1900. Complete mixtures, mainly 8–2–0 and 8–4–1,[1] are used. Homemade mixtures are preferred by some farmers. Nitrate of soda is quite extensively used, mainly as a top dressing. Lime has not come into general use. The scarcity of potash and the high price of acid phosphate have resulted in a decrease in the quantities of fertilizers used for all crops.

The total expenditure for labor in 1909 was $345,355, or an average of $161.23 per farm on 2,142 farms reporting. This average seems rather high, as so many small tenancies are classed as farms, but is accounted for by the large sums paid for labor on some of the large farms. Farms where the expenditure is less than the above average are greater in number than where it is equaled or exceeded. On many of the small tenancies practically all of the labor is done by the family, and on many others very little labor is hired. The laborers are mostly colored. The supply has always been fairly adequate for all farm needs, but laborers are becoming scarcer and are demanding higher wages. Labor is hired by the day, month, or by the piece. A fair average for the season of 1917 is 80 cents to $1 a day and $18 to $20 a month with board. Fifty cents per hundred pounds is the prevailing price for picking cotton.

The 1910 census reports 69.3 per cent of the area of the county in farms. There are 3,700 farms, of an average size of 62.3 acres. Improved land represents 34.6 acres, or 55.6 per cent of each farm, or 38.5 per cent of the total area of the county. The low average size is accounted for by the classing of tenancies as farms. The farms range in size from a few acres to several thousand acres. In some sections, especially in the central and east-central parts of the county, whole farms are practically all in cultivation, while in some other sections farms have only a few acres of cleared land. Outside of the river swamp there are only a few bodies of virgin forest. The county probably has a higher percentage of cleared upland than any other county in the State.

In 1910, 18.8 per cent of the farms were operated by owners, 80.4 per cent by tenants, and 0.8 per cent by managers. Many landowners direct operations on the home farm and have a general supervision over a number of small tenancies. In other cases the owners live in the towns and rent their farms, usually in small tracts. The per-

[1] The figures indicate the respective percentages of phosphoric acid, nitrogen, and potash.

centage of farms operated by the owners is noticeably higher in the best sections of the county. The greater number of tenancies are either one or two horse farms and range in size from 20 to 50 acres. The number of large leased farms is comparatively few. Several systems of leasing are practiced. The landowner may furnish seed, fertilizer, work stock, and house and receive a stipulated part, usually two-thirds, of the crop. When the owner furnishes one-half of the fertilizer and the house, the crop is usually divided equally. In case the owner furnishes none of the fertilizer, he receives from one-third to one-half of the crop. Cash rents range from $10 to $16 or even $20 an acre.

There is a wide range in land values in Marlboro County. The sale value of the deep sandy land in the northern part of the county is from $15 to $40 an acre; of the greater part of the Peedee River bottoms, from $15 to $25 an acre; of the Flatwoods portion of the southern part of the county, from $15 to $40 an acre; and of the well-drained sandy loams of the Marlboro, Orangeburg, Ruston, Greenville, and Norfolk series, in the remainder of the county, from $50 to more than $200 an acre.

SOILS.

Marlboro County lies in a belt extending from the Piedmont Plateau to the lower Coastal Plain and has a fairly extensive development of river terrace and flood plain. Differences in texture of the original material and subsequent differences of topography and drainage have resulted in the formation of a greater number of soils than occur in counties of less diversified natural conditions. Three well-defined soil groups, based on difference in the parent material and in the process of formation, are represented: Residual soils of the Piedmont Plateau; old sedimentary soils of the upper and lower Coastal Plain; and alluvial soils of the terraces and bottoms. The soils are grouped into series on the basis of color, structure, and origin. The series are divided into types on the basis of texture. As a rule the series distinction is well defined, but here and there types of the same texture belonging to different series merge into one another so gradually that their separation is an arbitrary matter. Differences, where not of sufficient extent and agricultural importance to warrant the establishment of a type, are mapped as phases. Twenty-one series, embracing 42 types and 10 phases, in addition to Muck, are recognized in Marlboro County.

Residual soils.—The residual soils cover an area of less than 2 square miles in the extreme northwestern corner of the county. They represent the weathered products of the underlying grayish, fine-grained Carolina slates. The soils of this group are unimportant,

as they occur for the most part on the steep slope toward the Peedee River from which the formerly overlying Coastal Plain deposits have been removed. Only one series of residual soils, the Georgeville, is mapped.

The Georgeville series includes types with brown to reddish-brown soils and red silty clay subsoils. Small fragments of the partially decomposed parent rock usually occur on the surface and within the soil material, which is underlain at shallow depths by bedrock. Quartz fragments also are present on the surface in most places.

Coastal Plain soils.—The formations from which the Coastal Plain soils have been derived are water-deposited material consisting chiefly of more or less unconsolidated beds of sands and clays. They represent sediments washed from the Piedmont Plateau and from the mountains to the north and deposited on the floor of the ocean when this region was submerged. Well borings at Bennettsville and McColl indicate that the deposits are approximately 475 feet thick at those points. The widely varying character of the present soils is due in part to the reworking and assorting action of shore currents, tides, waves, and winds; weathering, especially oxidation; the washing down or removal of the fine material; erosion; and the influence of vegetation. Within the area covered by the Coastal Plain soils are numerous small to moderately large depressions which have no natural surface outlet. In some cases these drain through the underlying material. Many of them are bounded by a narrow sand ridge on the south and east sides. No data regarding the character and structure of the underlying deep material are available. In some sections of the Coastal Plain similar depressions have been traced to the leaching out of portions or all of the stratum of limestone or of marl, and in this county the depressions may have been caused in a similar way.

The four divisions included in the upper and lower Coastal Plain have distinct soil characteristics, and certain series and types, though occurring elsewhere, are usually dominant in one of these divisions. For example, the Norfolk sand occurs in all of the divisions but predominates in the Sandhill section. The Coxville series is found mainly in the lower Coastal Plain, while the Hoffman series occurs only in the Sandhill section.

The soils of the Marlboro and lower Coastal Plains cover more than 80 per cent of the county and include an even higher percentage of the cultivated area. They belong to the Marlboro, Norfolk, Orangeburg, Ruston, Dunbar, Coxville, Grady, and Portsmouth series. The Sandhill section in the northern part of the county has distinct soil as well as topographic characteristics, the soil material doubtless being originally different from that giving the other Coastal Plain soils. Certain soil-forming agencies, particularly

erosion, the washing out of fine particles from the surface material, and wind action, have been much more active than in the remainder of the county. This division is characterized by well-drained soils of undulating to hilly topography, by a high percentage of deep sandy soils deficient in organic matter, and by narrow stream bottoms. The Norfolk series, in particular the deep sandy types, the coarse sand, and sand, and their sandhill phases, is by far the most extensive. Other series of minor importance are the Ruston, Marlboro, and Portsmouth.

The Greenville series is characterized by brown to reddish-brown or red surface soils and friable, red sandy clay subsoils. The surface is undulating to rolling and drainage is well established.

The Orangeburg series is distinguished by gray to grayish-brown, sandy surface soil, brown to browish-red upper subsoils, and friable, red sandy clay to heavy sandy clay subsoils. It has an undulating surface and good drainage.

The Ruston series includes types with gray to brownish-gray surface soils, light-brown upper subsoils, and yellowish-brown to brown and reddish-brown, friable sandy clay to rather heavy sandy clay subsoils, of a slightly sticky character. The material has the texture and structure of either the Norfolk or the Marlboro series. In color of subsoil it is intermediate between the yellow of the Norfolk and the red of the Orangeburg.

The Marlboro series has brownish-gray, sandy surface soils underlain by yellow, heavy sandy clay subsoils, frequently splotched with red below a depth of 24 inches. The subsoil has a characteristic sticky and soft, plastic but friable structure, which alone distinguishes it from the yellow subsoils of the Norfolk types. The soils are shallower and heavier than those of the Norfolk series. The Marlboro soils have a level to undulating or gently sloping topography and are well drained. They occur most extensively in a belt immediately south of the Sandhill section of this and other counties of the State.

The surface soils of the types included in the Norfolk series are gray. The subsoils range from yellow sand, in the sand members of the series, to yellow sandy material in the upper part and friable, yellow sandy clay in the lower part of the 3-foot section, as in the case of the sandy loam and fine sandy loam member of the series. Surface and subsurface drainage is adequate in normal seasons.

The Hoffman series includes types with gray surface soils underlain by friable, sandy clay subsoils ranging from yellow or red with a pinkish cast to mottled red, yellow gray, and purple color. These soils occupy sloping to hilly areas in the Sandhill section of the county.

The Dunbar series includes types which have moderately gray soils, yellow upper subsoils, and tough to very slightly plastic lower subsoils of yellow color, mottled with red and some gray. The surface is practically level, and surface and subsurface drainage is slow on account of the moderately dense structure and level character. This series represents moderately well drained areas of material similar to that giving the Coxville soils and is closely associated with that series. The soils are intermediate in drainage and stage of development between the Norfolk and Marlboro series on the one hand and the Coxville on the other.

The Coxville series is characterized by gray soils, by very pale yellow to mottled gray and yellow, stiff, heavy upper subsoils, and by lower subsoils of mottled gray, red, and yellow, tough to plastic clay. The red mottling is the most pronounced in the heavy types. The Coxville soils have a flat surface and very imperfect drainage.

The Grady series consists of types which have medium to dark gray or nearly black, compact surface soils; gray, friable to slightly plastic upper subsoils; and gray, heavy, plastic lower subsoils, mottled with red and some yellow. These soils occupy depressions within the other upland types. The natural drainage is usually very poor, but in a few cases water readily finds it way through the subsoil and the underlying material.

The Portsmouth series is characterized by dark-gray to black soils and gray, friable to slightly plastic subsoils, sometimes mottled with yellow. This series includes the most poorly drained soils of the upland, unsuited to cultivation without artificial drainage.

Alluvial soils.—The alluvial division includes soils in both a terrace and first-bottom position, occurring chiefly along the Peedee River. The terrace embraces a practically continuous belt of varying width extending from the North Carolina line to the southern extremity of the county. The soils of the terrace have been modified subsequently to deposition by oxidation, erosion, and the accumulation of organic matter. They are characterized by a level topography, fine textures, and heavy subsoils. Drainage ranges from poor to adequate. The soils belong to the Amite, Cahaba, Kalmia, Myatt, Leaf, and Okenee series.

The recent-alluvial soils cover a fairly continuous area of the Peedee River bottoms. They consist mainly of fine-textured sediments deposited during periods of overflow. The degree of oxidation, the character of the drainage, and differences in the parent material have resulted in the development of the several series. The Congaree and Wehadkee series are composed largely of material of Piedmont origin, the Thompson and Johnston series mainly of reworked Coastal Plain material.

The Amite series includes types which have brown to reddish-brown, friable soils and compact, red subsoils. It resembles closely the Greenville series of the upland. The Amite soils are well drained.

The soils of the Cahaba series have a gray to grayish-brown color and a friable structure. The subsoils consist of a brown to reddish-brown, compact to stiff clay, underlain by a stiff, mottled yellow, gray, and rusty-brown clay. The series occupies a flat and slightly sloping terrace position.

The Kalmia series includes gray surface soils, compact, yellow upper subsoils, and yellow, stiff lower subsoils, mottled with red and in a few cases with gray. The types of this series resemble closely those of the Norfolk and in places the Dunbar series. They occupy level terraces only a few feet above the first bottoms. This is the most extensive of the terrace series.

The Myatt series has gray surface soils underlain by yellow, compact clay subsoils or in places by yellowish-gray to gray, mottled with yellow and rusty brown, plastic to somewhat sticky subsoils. It closely resembles the Portsmouth and Grady soils except in color. The Myatt soils have a level surface and poor drainage.

The Leaf series embraces the types with gray surface soils and stiff, tough subsoils ranging from very pale yellow and yellow and gray mottled, in the upper part, to mottled gray and red, with some yellow, in the lower part of the 3-foot section. The soils closely resemble those of the Coxville series of the upland. They occur on rather poorly drained shortleaf-pine flats on the river terraces.

The Okenee series is characterized by black surface soils and gray, compact subsoils. It corresponds closely to the Portsmouth series of the uplands. The Okenee soils occupy slight depressions or flats, usually near the upland side of the river terrace, and are very poorly drained.

The Congaree series is distinguished by brown surface soils and compact, brown subsoils, both soil and subsoil carrying small mica flakes. The surface is generally flat. The lighter textured members lie slightly higher and nearer the river channel and are moderately well drained, but the heavy members drain slowly. The Congaree soils are subject to overflow, and diking and ditching are necessary in order to insure good crops.

The Wehadkee series embraces the types which have light-gray to brownish-gray surface soils and compact, heavy subsoils of light-gray color, mottled with brownish-yellow or brown. In places the upper subsoil has a distinctly yellow color and is underlain by a stiff, mottled yellow, red, and gray material. The series is subject to overflow and is very poorly drained.

The Thompson soils are gray, with friable, yellow subsoils. They are moderately well drained, except during infrequent periods of overflow.

The Johnston series includes dark-gray to black, mucky soils with gray to mottled gray and yellow subsoils. The series occupies flat first bottoms along Coastal Plain streams and is very poorly drained.

The following table gives the name and the actual and relative extent of each of the soil types mapped in Marlboro County:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Marlboro sandy loam	53,056	16.0	Kalmia sandy loam	3,392	1.0
Norfolk sandy loam	30,144		Amite sandy loam	1,792	1.0
Rolling phase	3,648	10.3	Low-terrace phase	1,536	
Deep phase	256		Dunbar sandy loam	3,072	.9
Norfolk sand	19,840	8.1	Coxville sandy loam	3,072	.9
Sandhill phase	6,848		Portsmouth sandy loam	2,944	.9
Johnston loam	25,920	7.8	Georgeville silty clay loam	2,944	.9
Congaree silty clay loam	23,616	7.1	Kalmia silt loam	2,816	.8
Hoffman coarse sandy loam	14,464	4.4	Coxville clay loam	2,496	.8
Dunbar very fine sandy loam	4,416	3.3	Congaree silt loam	1,792	.6
Slope phase	6,720		Terrace phase	448	
Wehadkee silty clay loam	10,944	3.3	Congaree fine sandy loam	1,856	.6
Ruston sandy loam	8,384		Myatt sandy loam	1,792	.5
Deep phase	1,664	3.1	Dunbar silt loam	1,792	.5
Coarse phase	256		Cahaba clay loam	1,536	.5
Norfolk coarse sand	8,576		Norfolk fine sandy loam	1,408	.4
Sandhill phase	1,472	3.1	Leaf sandy loam	1,408	.4
Loamy phase	192		Thompson loam	1,344	.4
Coxville silt loam	10,176	3.1	Marlboro fine sandy loam	1,344	.4
Portsmouth loam	9,984	3.0	Ruston sand	832	.3
Grady loam	9,728	2.9	Ruston fine sandy loam	832	.3
Kalmia very fine sandy loam	9,088	2.7	Amite loamy sand	768	.2
Okenee loam	7,616	2.3	Greenville sandy loam	704	.2
Leaf silt loam	7,040	2.1	Kalmia fine sandy loam	576	.2
Norfolk coarse sandy loam	6,528	2.0	Orangeburg loamy sand	448	.1
Muck	4,416	1.3	Grady clay loam	320	.1
Orangeburg sandy loam	3,904	1.2	Total	332,160	

GEORGEVILLE SILTY CLAY LOAM.

The Georgeville silty clay loam consists of 5 or 6 inches of brown to reddish-brown silt loam to silty clay loam, underlain by brittle, red silty clay to a depth of 3 feet or more. The subsoil frequently shows some yellow mottling and usually carries fragments of partially decomposed slate. A shallow gray silt loam mantle covers the surface in places. This is either so thin that the red clay material is turned up in plowing or it has been entirely removed by erosion so that the red clay forms the present surface soil. Quartz fragments

occur in a few places. On the steeper slopes the partially decomposed rock is encountered within the 3-foot section.

As this type lies immediately below the gravelly and sandy Coastal Plain strata, some of the latter material has washed down over the surface in places, giving rise to small areas of soil which belongs to the Bradley series. Such areas are not large enough to map.

The Georgeville silty clay loam occurs only in the extreme northwest corner of the county, where it occupies much of the lower part of the break from the upper Coastal Plain level to the Peedee River. It extends farthest back from the river along the tributary streams which flow in narrow, steep-sided valleys. Only a few small tracts susceptible of cultivation occur. The surface ranges from strongly rolling to steep and broken, and drainage is excessive.

This is a very unimportant type. Only small tracts are in cultivation, with the remainder in forest. Wheat is about the only crop grown. Exposed surfaces erode readily, and cultivation is difficult. The type can best be used in producing timber crops. Its value for agricultural purposes is very low.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Georgeville silty clay loam:

Mechanical analyses of Georgeville silty clay loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
242901	Soil	1.4	7.8	3.6	6.5	2.8	56.5	21.3
242902	Subsoil	.5	2.8	1.1	2.5	1.5	35.0	56.3

GREENVILLE SANDY LOAM.

The Greenville sandy loam consists of 6 to 10 inches of rather loose, brown to reddish-brown loamy sand to light sandy loam, underlain by a dark red sandy loam to friable sandy clay which continues to a depth of 3 feet or more. As mapped, the type includes some areas of material coarser than sandy loam.

The only area of the Greenville sandy loam mapped covers slightly more than 1 square mile, about 5 miles southwest of Bennettsville. The surface is practically level. No drainage ways are developed, as the soil absorbs all the rainfall. The subsoil structure permits the excess water to find its way downward, but the material retains sufficient moisture for crops.

The Greenville sandy loam, though inextensive, is nearly all in cultivation. A small acreage supports a rather heavy growth of oak, with a few scattered pines. This is an important soil on the farms where it occurs. It is productive and easily tilled and is as well farmed as any type in the county.

Cotton is the leading crop. Corn, grain, cowpeas, cantaloupes, and other crops are grown on a smaller scale. Excellent yields are obtained nearly every season. The farming methods and fertilizer practices are practically the same as on the well-farmed areas of the Marlboro, Ruston, and Orangeburg sandy loams.

No land of this type is on the market. It is valued at $150 or more an acre.

ORANGEBURG LOAMY SAND.

The soil of the Orangeburg loamy sand is a loose, grayish-brown loamy sand to a depth of 6 inches. The subsoil consists of a loose, reddish to reddish-brown loamy sand to a depth of 20 to 24 inches, underlain by a red, sticky, light-textured sandy loam which extends to a depth of 3 feet or more. The changes in color and texture of soil, subsoil, and deep subsoil are very gradual. Throughout the type the texture grades toward a loamy coarse sand rather than a fine sand. The area near Madeline consists of grayish sand grading into yellowish-brown, slightly loamy sand which in turn changes into the typical subsoil. Several isolated areas of Orangeburg loamy sand, from a few acres to 400 acres in extent, occur in the more or less sandy belt bordering the Peedee River terrace. One area is located near New Hope School in the northwestern corner of the county. The largest area lies about 4½ miles southwest of Bennettsville, where it is associated with the Norfolk sand and sandy loam.

The surface of the Orangeburg loamy sand is level to very gently undulating. There is very little run-off, as the type absorbs practically all the rainfall. Internal drainage is good.

This type is of local importance. All of it is in cultivation. The type has a moderately low organic-matter content. It is easily tilled under a wide range of moisture conditions, and crops seldom suffer from drought or an excess of moisture. The soil is considered desirable for cotton, corn, and a number of other crops. Cotton is the leading crop. Corn is of minor importance. Under good farming methods the yields closely approach those obtained on the Orangeburg sandy loam. The farming methods do not differ essentially from those on associated soil types.

The Orangeburg loamy sand covers parts of large farms, and has a sale value of $50 to $100 an acre.

The content of organic matter of this type should be increased by growing leguminous and other cover crops. Rotations should be adopted that would enable such diversification.

ORANGEBURG SANDY LOAM.

In its typical development the Orangeburg sandy loam in this county consists of 6 inches of gray loamy sand grading into a brownish-yellow or reddish-yellow loamy sand, which at a depth

of 14 to 16 inches is underlain by a friable, bright-red sandy clay extending to a depth of 3 feet or more.

The type in many places is associated with the Marlboro sandy loam and represents Marlboro material with a red subsoil. In such case the type consists of about 6 inches of brownish-gray loamy sand underlain by brownish-red sandy loam, which at 10 to 12 inches rests upon a red, heavy sandy clay to clay loam. A few small shallow areas occur on short slopes toward stream courses and depressions. In these the sandy surface soil rests directly upon the red subsoil, which is exposed here and there where the soil mantle has been eroded completely away. In places the material grades toward coarse and in others toward fine sandy loam. Here and there some small gravel occurs in the soil.

The largest area of Orangeburg sandy loam occurs 2 to 4 miles north of Bennettsville. An important area lies in the northwestern corner of the county near New Hope Church, and another about 3 miles northwest of Bennettsville. Several small areas are scattered over the upland division of the county. The type is associated with the Norfolk, Marlboro, and Ruston sandy loams. Its surface is level to very gently undulating or gently sloping. Even moderately steep slopes are uncommon, but all of the type is well drained.

The Orangeburg sandy loam is an important type, although its total area is small in comparison with the sandy loam of either the Norfolk, Marlboro, or Ruston series. A small part of the area north of Bennettsville is in forest; the rest of the type is in cultivation. This was one of the first soils in the county to be cultivated. The soil usually holds sufficient moisture for crops, and yet they do not suffer during seasons of excessive rainfall. The soil is easily tilled under a wide range of moisture conditions and responds readily to good treatment. It is one of the most productive soils in the county and the greater part of it has been well farmed and is in a good state of cultivation. It is especially adapted to the production of cotton, and is also one of the best general-farming soils in the State.

Cotton is by far the most important crop. Corn, grain, and forage crops are grown to some extent. Yields average as high as on any type in the county. Cotton yields 1 to 1½ bales per acre and corn from 15 to 30 bushels. Oats do well, the yield ranging upward of 35 bushels per acre. Wheat gives good yields. Practically all forage crops are successful. Farm methods are in a general way the same as on the Norfolk and Marlboro sandy loams.

This type commands as high a sale value as any other type in the county, the price ranging from $100 to $150 an acre.

The general appearance of the farms, crops, and buildings on this soil indicate that its farming has been successful. The soil, however, needs more organic matter to replace the constantly decreasing sup-

ply. Leguminous crops, such as cowpeas, velvet beans, and vetch, and winter cover crops may be turned under for this purpose. The use of 2-horse implements would not only save time and labor but make the cultivation more efficient. Crops should be diversified in order that sufficient forage, vegetables, fruit, etc., may be grown to supply all the needs of the home and the stock. This will also permit a much-needed rotation of crops. Deeper plowing and more frequent shallow cultivation would prove beneficial.

Included with the Orangeburg sandy loam, and shown on the map by gravel symbols, are some gravelly areas of the type. These consist of a reddish-brown gravelly loamy sand to a depth of 8 inches, underlain by a red gravelly sandy loam which usually rests upon the gravelly, red sandy clay subsoil near the bottom of the 3-foot section. The gravel consists of well-rounded quartz fragments ranging from a fraction of an inch to 3 or 4 inches in diameter. These gravelly areas occur only in the extreme northwestern corner of the county on or near the North Carolina line. They are of little agricultural importance, though nearly all under cultivation. The surface ranges from undulating to steeply sloping. Drainage is well established and in places excessive. Cotton and corn are successful, but the yields are lower than those obtained on the typical sandy loam. Plowing and cultivation are rather difficult owing to the gravel, but its presence on the surface prevents destructive erosion even on steep slopes.

RUSTON SAND.

The Ruston sand is a loose, light-brown sand, with a depth of 6 to 8 inches. The subsoil is a sticky, brown to reddish-brown sand or loamy sand extending to a depth of 3 feet or more. The type carries varying quantities of coarse sand grains and in places approaches a loamy coarse sand in texture. It differs from the Orangeburg loamy sand mainly in the brown color of its subsoil, the subsoil of the latter being red.

The greater part of the Ruston sand occurs in the northwestern corner of the county in association with the Norfolk sand. Several areas occur elsewhere in the Sandhill section. An area of rather coarse texture lies to the east of Mossy Bay. Other narrow strips border a few of the depressions in the Marlboro Plain. Where it is associated with the Norfolk sand, spots of this type are conspicuous on account of their brownish surface material.

The surface of the type is level to very gently undulating. Good surface and internal drainage exists.

This is a comparatively inextensive and unimportant soil type. Though the structure is rather loose the type usually holds sufficient moisture for crops. It is easily tilled under a wide range in moisture

conditions, and readily responds to good methods. Practically all of it is cleared and farmed.

The Ruston sand is used almost exclusively for growing cotton. Corn and wheat are minor crops. Moderate yields are obtained. The type has about the same selling value as the associated soils in the several sections of the county.

The Ruston sand is fairly well farmed but needs more organic matter, which may be supplied by turning under leguminous and grain cover crops.

RUSTON SANDY LOAM.

To an average depth of 6 inches the Ruston sandy loam is a gray to brownish-gray sand which frequently carries enough fine material to give it a loamy texture. The subsurface layer is a brownish-yellow to reddish-yellow loamy sand to a depth of 12 to 15 inches. The subsoil is a yellowish-brown to reddish brown, moderately friable sandy clay extending to a depth of 3 feet or more.

Along the contact with the Marlboro and Orangeburg soils the type consists of 6 to 8 inches of moderately loose, light-brown loamy sand which grades quickly into a yellowish-brown to reddish-brown, slightly sticky to heavy sandy clay in which red mottlings frequently appear at depths approximating 3 feet. Small spots occur where the subsoil material lies near enough the surface to give the surface material a reddish-brown color.

The Ruston sandy loam is widely distributed over the upland between the Sandhill section on the north and the Flatwoods section on the south and west. The areas are for the most part small. In many instances they either border the stream bottoms or occur in connection with well-developed depressional areas of Grady and Portsmouth soils. Most of the type has a broadly undulating to nearly level surface. Where it borders stream bottoms rather short, gradual slopes are characteristic. In only a few instances are the slopes steep. All of the type is thoroughly drained.

The Ruston sandy loam is of high agricultural importance, as it is widely distributed over the best sections of the county and probably 95 per cent of it is in cultivation. It is regarded as a productive, desirable soil, adapted to cotton, corn, grain, and all the other common crops. The soil is somewhat low in organic matter. It is easily tilled under a fairly wide range in moisture conditions and does not clod or bake. It holds moisture as well as any soil in the county. Cotton is grown on 90 per cent or more of the acreage in cultivation. Corn is planted in small patches for farm use. Oats, wheat, cowpeas, potatoes, and vegetables are very minor crops.

Yields on this type have practically the same range as on the Marlboro and Orangeburg sandy loams. Cotton yields from three-fourths

to 1½ bales per acre, corn 15 to 35 bushels, and oats 25 to 35 bushels. All other crops do well. Yields are seldom seriously lowered by unfavorable climatic conditions during the growing season. This soil is handled in the same way as the Marlboro and Norfolk sandy loams, and it can be improved by the same means. The exchange of land of this type is not active. Values of $100 to $200 an acre are frequently quoted.

Ruston sandy loam, deep phase.—The deep phase of the Ruston sandy loam consists of about 6 inches of gray to brownish-gray sand underlain by a brownish-yellow to light-brown, slightly loamy sand which at a depth of 24 to 30 inches rests upon a yellowish-brown to reddish-brown, friable sandy clay. This phase differs from the typical soil principally in the depth to the clay subsoil.

The deep phase is inextensive. Several small areas occur in the same general region as the typical Ruston sandy loam and in the lower parts of the Sandhill section. It has a nearly level surface, but is well drained. All of it is farmed to cotton and corn. Good crops are obtained with proper management, but yields range slightly lower than on the typical soil.

Farming methods follow closely those in use on more extensive sandy types.

Ruston sandy loam, coarse phase.—The Ruston sandy loam, coarse phase, consists of a loose, gray, coarse sand to a depth of 6 to 8 inches, grading into a brownish-yellow to light-brown slightly loamy coarse sand which is underlain at 15 to 20 inches below the surface by a yellowish-brown to reddish-brown, friable sandy clay. This continues to a depth of 3 feet or more. In places fine quartz gravel occurs on the surface and in the sandy mantle. Small spots exist where the subsoil lies relatively close to the surface and in these the soil has a distinctly brown color.

This phase is of small extent. A considerable acreage occurs near Blenheim on slopes along Three Creeks. Other small areas are found to the south and west of Lester.

Practically all of the phase occupies well-defined slopes bordering first bottoms, terraces, or flats, and drainage is thorough. Its agricultural importance is slight, although the greater part of the soil is in cultivation to cotton and corn, which give fair yields. The phase is handled in the same manner as the other soils of the Ruston series.

RUSTON FINE SANDY LOAM.

The surface of the Ruston fine sandy loam is a gray fine sandy to loamy fine sand grading at about 6 inches into a yellowish to light-brown loamy fine sand. At 10 to 12 inches the fine sandy material changes quickly into a somewhat friable, yellowish-brown to reddish-

brown fine sandy clay, friable but compact, which extends to a depth of 3 feet or more.

Where the fine sandy material is deepest the soil has a distinctly gray color and a light texture. Where the fine sandy layer is shallow it has a yellowish-brown to brown color and the subsoil is distinctly reddish brown. In spots too small to map the clay subsoil has been exposed by the removal of the sandy mantle. An area of approximately 200 acres, one-half mile southeast of Covington Mill, may be considered a shallow phase of the Orangeburg fine sandy loam. In the Flatwoods region the soil to a depth of about 6 inches is a grayish-brown very fine sandy loam to fine sandy loam, resting directly upon a reddish-brown, rather dense clay loam to silty clay which becomes slightly mottled with yellow in the lower part of the 3-foot section.

The greater part of the Ruston fine sandy loam lies about 4 miles southeast of Bennettsville, in association with the Marlboro fine sandy loam. Other small areas are scattered here and there. The surface is very gently undulating to sloping. Much of the type covers a section where the depressional areas are abundant and well defined, and they are to a large degree responsible for the present surface features of the type. Both surface and subsurface drainage are thorough. Practically no stream courses occur within the type.

This is an important soil in the limited section where it is the dominant type. All of it is in cultivation. It is regarded as a productive soil on which crops are not readily affected by extremes of rainfall. Cotton is the leading crop. Corn, oats, cowpeas, and vegetables are grown for home consumption. Yields range about the same as on the Ruston sandy loam. The type is farmed in the same way as the sandy loam, and can be improved by the same means. The land ranges in value from $30 to $100 or more an acre.

MARLBORO SANDY LOAM.

The Marlboro sandy loam is a gray to grayish-brown loamy sand to light sandy loam, with a depth of 6 inches, underlain as a rule by a subsurface layer of yellow sandy loam 2 to 6 inches thick. The subsoil to a depth of 3 feet or more is a deep-yellow or cottonseed-meal colored, heavy sandy clay, usually splotched with red below a depth of 24 to 30 inches. Both soil and subsoil usually have a more compact structure than the Norfolk sandy loam types. The subsoil is sticky and slightly plastic but seldom tough. Small pebbles or accretions are common in it, but seldom abundant. In places a substratum of red and yellow or gray and yellow mottled clay occurs at a depth of several feet below the surface.

The Marlboro sandy loam closely resembles the typical Orangeburg sandy loam in texture and structure. It grades shallow rather than

deep, and in places the subsurface layer is either very thin or the soil rests directly upon the heavy subsoil. As a rule the soil carries coarse sand grains, and in places the type approaches a coarse sandy loam in texture. East of Bennettsville in places it grades toward a fine texture. The splotches of red in the subsoil are frequently lacking. Where these splotches are especially abundant the material is slightly brittle and less plastic. The brownish color of the soil is especially emphasized when moist or wet.

This type characteristically has a heavier texture throughout the 3-foot section than the Norfolk sandy loam. The soil auger is pulled out with difficulty, as the material clings to the sides of the boring.

The Marlboro sandy loam occurs in each of the divisions of the county except the alluvial division. It is most extensively developed over that part of the county north and northeast of Bennettsville, where it is the dominant type. Other important areas occur about 6 miles east of Bennettsville, 3 to 4 miles southeast of Clio, north of Blenheim, west and southwest of Bennettsville, 3 to 4 miles southwest of Blenheim, and east of New Hope School in the northwestern part of the county. The most commonly associated types are the Ruston, Norfolk, and Orangeburg sandy loams.

The Marlboro sandy loam has a nearly level or very gently undulating to gently sloping surface. Short, steep slopes are very infrequent. The type covers broad interstream areas whose surface is dotted with depressions occupied by dark-colored soils. There is a fairly well-defined southward slope over the main body of this type. This seems to be more noticeable west than east of Crooked Creek.

This soil has good drainage. Several large streams and a number of small ones traverse it, but branches do not ramify to all portions of the type, and extensive areas occur which have no connection with drainage courses. These drain in part internally and in part into the depressions, which are drained either artificially by ditches or naturally through the underlying material.

The Marlboro sandy loam is one of the most extensive and important soil types in the county. It is the only important type which is predominant over any considerable area. Practically all of it is devoted to crops. Soil, drainage, and topographic conditions as well as location are all favorable to cultivation. This was one of the first upland soils to be cleared and farmed. It has a structure which permits good internal drainage, yet it retains sufficient moisture within reach of crops. It is productive and easily farmed under a considerable range in moisture conditions. The content of organic matter is rather low, though on the whole it is higher than in other soils which have been under cultivation for the same length of time. This type forms either the whole or a part of many of the best farms.

Cotton is the chief and the only money crop. Corn is grown for forage, but only on a small acreage. Oats, wheat, rye, potatoes, vegetables, and other crops are grown, though not in sufficient quantities to supply the local needs. A few farmers are growing cantaloupes commercially. Yields average as high as on any other type in the county, or even higher, owing not only to the productive character of the soil, but also in part to the generally good farming methods in use. Cotton yields 1 to 1½ and in some instances 2 bales per acre. The yields of long staple are slightly less than of short staple cotton. Corn yields 20 to 35 bushels per acre, wheat 10 to 30 bushels, and oats range from 20 to 50 bushels. Cantaloupes average about 250 crates per acre.

This is probably the best farmed soil in the county. Much of the plowing is done with 2-horse implements, but subsequent cultivation is largely with 1-horse implements. The growing of cotton has been so successful that other crops have in a large degree been neglected, and in the last few years sufficient feed and forage crops have been grown to supply only a very small part of the farm needs, the farmers considering that an acre in cotton brings more than enough income to buy the subsistence products which could be grown on it. In many cases tenants are compelled to plant only a very few acres in corn.

The fields are kept in continuous cultivation for years without rotation. Cowpeas are generally planted between the corn rows and cut for hay in the fall. A few farmers sow rye between the cotton rows to serve as a winter cover crop, which is either turned under in the spring or allowed to ripen seed. The acreage in oats and wheat is comparatively small, as the former crop is usually grown on the associated soils of the Portsmouth and Grady series. Where these crops are grown on this type they are followed by corn the same season; cantaloupes are followed by cowpeas; Irish potatoes are followed by cotton.

Stable manure is applied to the cotton land as far as possible and cotton is always heavily fertilized. There has been a slight decrease in the acreage applications in the last few years on account of the scarcity of potash and the high cost of other essential ingredients. From 600 to 800 or 1,000 pounds per acre is used for cotton, two-thirds of this amount being applied at planting time and the remainder later. Nitrate of soda is also applied about June 1, at the rate of 150 pounds per acre. Some farmers use commercial fertilizers for corn, but cottonseed meal is most commonly used.

Land within that part of the county where this type is extensively developed commands a high price. It is held in fairly large farms

and very little is on the market. The average sale value exceeds $125 an acre, and as high as $200 an acre has been reported.

The present one-crop system of farming must be somewhat modified before the productiveness of this type can be increased and maintained at its maximum. If more subsistence crops were grown, a rotation could be adopted, including leguminous and cover crops, without cotton losing its place as the chief money crop. The use of two-horse implements in cultivation would give better results. Subdividing the rather large holdings would result in better farming.

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

Mechanical analyses of Marlboro 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.*
242924	Soil	1.7	15.2	12.8	42.4	16.4	8.4	3.2
242925	Subsurface	2.5	14.5	11.4	34.4	13.9	15.9	7.6
242926	Subsoil	2.8	10.8	7.0	21.6	9.8	12.1	35.7
242927	Lower subsoil	1.6	9.5	7.3	19.7	8.0	9.2	44.4

MARLBORO FINE SANDY LOAM.

The surface soil of the Marlboro fine sandy loam consists of about 6 inches of gray to brownish-gray, light fine sandy loam, underlain by yellow fine sandy loam. The subsoil, encountered at 8 to 12 inches, is a yellow, heavy fine sandy clay usually splotched with red below a depth of 24 or 30 inches. Scattered pebbles, accretions, occur on the surface and in the soil material. The soil though light in texture is fairly compact; the subsoil is typically rather sticky and slightly plastic. When very dry it appears more friable. The type grades toward a very fine sandy loam in some places, and in others may carry more than the usual amount of medium sand.

The Marlboro fine sandy loam occurs in several fairly well-defined areas in scattered sections of the county, principally about 4 miles east of Bennettsville and to the north of Clio. Another body is mapped north of Blenheim. An area of about 1 square mile lies 1 to 2 miles west of Drake.

The surface of this type is level to gently undulating. There are fairly numerous depressions containing other soil types. Drainage courses are infrequent, although there is some run-off. The greater part of the rainfall is absorbed, and the internal drainage is good.

This is an important soil type in small sections where it is the dominant soil. Almost all of it is under cultivation, as natural conditions were favorable for its early development. The structure of

the type permits the excess moisture to drain away, yet the soil holds a sufficient supply to carry crops over dry periods. The soil is easily tilled and responds readily to good farming methods. Much of the type is fairly well farmed. It is regarded as productive and desirable for special and general crops. Cotton is the predominating crop. The production of other crops, mainly corn, oats, and vegetables, is insufficient to meet the home and farm needs. There is practically no difference between yields on this type and on the Marlboro sandy loam. It is farmed in the same way, and the suggestions given for the improvement of the Marlboro sandy loam apply equally well to this type.

Mechanical analyses of Marlboro 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.*
242928	Soil	0.5	6.4	6.8	58.0	9.5	14.4	4.4
242929	Subsurface	.6	6.4	7.6	61.0	10.8	10.0	3.6
242930	Subsoil	.3	4.3	4.6	39.7	7.0	11.1	32.6
242931	Lower subsoil	.4	4.0	4.5	38.2	5.6	8.6	38.0

NORFOLK COARSE SAND.

The Norfolk coarse sand consists of 6 to 8 inches of gray, coarse sand, underlain by pale-yellow to deep-yellow, coarse sand to a depth of 3 feet or more. The depth of the sand mantle over the sandy clay ranges from 4 to 15 feet or more. The type has a loose and porous structure throughout the 3-foot section. In places it carries angular quartz material coarser than coarse sand. The immediate surface in forested areas is usually medium gray in color for 1 or 2 inches, underlain by pale-yellow, coarse sand. As a rule the subsoil is brighter yellow than in the sand member of the series.

Where the type occurs on narrow sandy ridges bordering depressions it has a medium-gray surface layer 2 or 3 inches deep, underlain by an almost white, coarse sand to a depth of 3 feet or more. Material of this character does not properly belong to this type but is included on account of its small extent.

The Norfolk coarse sand does not occur extensively in the coarse sandy part of the Sandhill section. Areas are mapped near the Richmond County, N. C., line, in the drainage basins of Crooked and Lightwood Knot Creeks, on the edge of the Sandhill section about 2 miles east of Hickson, in the southern part of the county north and southeast of Drakes Pond, between Bristow and the Dillon County line, and bordering Gum Swamp on the east from the Scotland County, N. C., line nearly to the Little Peedee River.

The surface of this type ranges from level to undulating. The area east of Gum Swamp is the most irregular, closely approaching the sandhill phase in surface features. Not many drainage ways traverse the type, but a number head just within its boundaries. A few areas of this soil occupy low ridges on the south and east of the depressions within various sandy loam types. All the rainfall finds its way downward through the soil, and there is no run-off. The type is well drained.

The coarse sand is not as extensive or as widely distributed as the Norfolk sand, and its agricultural importance is less, as only about one-half of it is cleared and farmed. The percentage is reduced by the comparatively small farming development in the Sandhill section and on the east side of Gum Swamp. The growth in the forested areas consists of longleaf pine and some oak. The type is deficient in organic matter, is droughty in seasons of less than normal rainfall, and has only a low to medium productive capacity. In some seasons fertilizers leach beyond the reach of crop roots. Occasionally during long-continued rains, crops suffer from an excess of water on more or less level areas where the depths to clay is slightly in excess of 3 feet. The soil responds readily to good treatment and its productiveness may be readily increased.

Cotton is the leading crop. Corn is second in importance. Other crops occupy a very minor place in the agriculture. Yields range from light to medium, depending upon the season and the kind of farming. Cotton yields one-half to 1 bale per acre, with now and then smaller crops. Corn yields 10 to 20 bushels per acre.

Medium to heavy applications of fertilizers are used for all crops. From 600 to 1,000 pounds per acre of an 8–4–1 mixture (formerly 8–4–4) is used for cotton. About two-thirds of the fertilizer is applied when the crop is planted, and the remainder at one side of the row about June 1. Nitrate of soda is applied also about June 1, at the rate of 150 pounds per acre. Cottonseed meal is the principal fertilizer used for corn.

The price of land of this type has a wide range, considering the character of the soil. In the Sandhill section the price ranges from $15 to $25 an acre, while in other parts of the county it is from $25 to $75 an acre. The suggestions given for the improvement of the Norfolk sandy loam will apply equally well to this type.

Norfolk coarse sand, sandhill phase.—The soil of the Norfolk coarse sand, sandhill phase, is a gray, incoherent coarse sand. The subsoil is a loose, pale-yellow to yellow coarse sand extending to a depth of 3 feet or more. The depth of the sandy mantle ranges from 5 to 14 feet or more. The phase carries some angular quartz gravel. The separation of this phase is in large measure based on topography

and agricultural value. It covers deep sandy areas whose surface is more irregular than that of the typical Norfolk coarse sand.

This phase occurs for the most part in the drainage basin of Whites Creek, in the extreme northern part of the county. It is the predominant type along the Richmond County, N. C., line from a point about 2 miles east of the Washington and Atlanta Highway west to the Hamlet Road. Smaller areas occur elsewhere in the Sandhill section. An area lies near the Dillon County line about 1½ miles east of Brownsville.

The topography of this phase more closely resembles that of the typical Sandhill belt of North and South Carolina than does that of the same phase of the Norfolk sand. The hills are higher and larger, with moderate to steep slopes. In places the phase covers the slopes to the streams as well as the divides. Drainage ways are abundant, but there is little run-off. The soil absorbs the rainfall, which finds its way through the underlying material to the streams and to greater depths.

Only a few acres here and there are used for crops. Nearly all of the phase has a timber growth of scrub oak, blackjack, and a few longleaf pines. The rough topography, the tendency toward droughtiness, and its natural low crop-producing power have prevented the development of this soil. Though rather inaccessible to markets, it lies fairly close to the railroad.

Cotton and corn are the only crops. The yields are light and uncertain, especially since a sufficient supply of potash has been unobtainable.

Land of this character is held for the most part in large tracts, and there are practically no sales. The selling value of areas which have no valuable timber ranges from $5 to $15 an acre.

Norfolk coarse sand, loamy phase.—The loamy phase of the Norfolk coarse sand consists of 6 or 8 inches of loose, gray to light brownish gray coarse sand, underlain by a somewhat coherent, yellow to orange-yellow, loamy coarse sand to a depth of 3 feet or more. The phase has a loaminess in the subsoil which is not characteristic of the greater part of the type.

Several areas of the loamy phase occur between Crooked and Naked Creeks, on or near the Wire Road. Others lie both north and south of the Little Peedee River bottom, in the extreme eastern portion of the county. The surface is level to very gently undulating or sloping. There is no run-off, as all the rainfall is readily absorbed. The structure of the subsoil permits good internal drainage.

This phase is important in the sections where it occurs near the loose, deep sandy soils. It represents the best grade of land classified as Norfolk coarse sand.

Cotton is the only important crop. The yields average slightly higher than for the typical Norfolk coarse sand and almost as high as for the Norfolk sandy loam. The farming methods do not differ essentially from those in common use on the sandy loam. The value of this phase varies with the associated types and the location. The phase can be improved by the same general means suggested for the improvement of the more level types of the Norfolk series.

NORFOLK SAND.

To a depth of 6 to 8 inches the Norfolk sand is a loose, light-gray to dark-gray sand. The subsoil is a porous, pale-yellow to yellow sand of uniform character to a depth of 3 feet or more. Yellow sandy clay underlies the type at depths ranging from 3 to 10 feet or more. Quartz sand of medium grade comprises the greater part of the material. The virgin soil usually has a thin mantle of gray sand underlain by pale-yellow sand. Upon cultivation the two layers become mixed, giving the whole a gray color which upon continued cultivation becomes lighter. The subsoil ranges from yellowish gray through yellow to orange yellow, depending largely on the amount of fine material and upon the depth to the underlying yellow sandy clay. In general, it seems to have more color in the Sandhill section than in the flat areas in the more recent Coastal Plain.

Near the margins of the type the underlying sandy clay may be encountered within the 3-foot section. In places there is a noticeable content of coarse sand. Several areas have been included whose subsoil is sufficiently loamy to constitute a loamy phase. Some of the sandy ridges bordering depressions have a gray to white soil and subsoil.

The Norfolk sand occurs in all parts of the county except the alluvial division and the fine-textured part of the Flatwoods. The areas range from small to large. In general, the type is least extensive in the central and west-central parts of the county. Its most important development is in a more or less continuous belt, averaging 1 mile in width, extending from 1 mile north of Salem Church southeast to the Dillon County line. Other important areas are located in the vicinity of Bethel Church, in the extreme northwestern part of the county, 1 to 2 miles north of Kollock, north of Aarons Temple, between Crooked and Lightwood Knot Creeks, 2 miles south of Boykin Church, south and southwest of Newtonville, 1 to 2 miles north of Willis School, northeast of Bullards Mill, 2½ miles northwest of McLaurins Mill, and northwest and north of McColl.

The greater part of this type is found in three more or less distinct positions. In the Sandhill division it occupies the highest elevations in the section where it is found, either on ridges or broad, undulating flats or divides. In other places it borders the Peedee River terrace

and the bottoms of certain creeks, in particular Crooked and Beaverdam Creeks, and has a level to undulating or sloping surface. Nearly all the remainder of the type is associated with the numerous depressions and bays. Here it occurs either on small, narrow ridges or in more extensive areas, largely on the south and east sides of these depressions.

All the Norfolk sand is well drained. Practically no drainage courses are developed in the type, but the surface material readily absorbs the rainfall and the porous structure usually permits the water to find its way downward. In the rather level areas where the depth to the underlying clay only slightly exceeds 3 feet the moisture conditions are fairly good.

The Norfolk sand is locally an important soil type. Approximately 90 per cent of it is in cultivation. The forested areas have a growth of scrub oak, the original longleaf pine having been removed. Practically all of the type is capable of cultivation. The soil is especially deficient in organic matter. Its moisture-holding capacity is rather low and the loose, sandy subsoil in places allows fertilizers to leach beyond the reach of crops. The type warms up early in the spring and can be cultivated soon after heavy rains. Its natural productiveness is relatively low, and seems to vary with the depth to the underlying clay and with the amount of fine material in the soil and subsoil.

Cotton is the leading crop, followed by corn. On some of the smaller areas associated with the Marlboro, Ruston, and Norfolk sandy loams corn is the principal crop. Oats, potatoes, vegetables, forage crops, and fruit are grown to a small extent, and a little tobacco is produced in the extreme southern part of the county.

Medium to light yields of cotton and corn are obtained under the present methods of cultivation. On some farms where attention has been given to building up the soil the yields are fairly satisfactory. Yields have decreased in the last few years on account of the scarcity of potash. Cotton yields on the average about one-half bale to the acre, but with heavy fertilization and improved methods of farming 1 bale may be obtained. The yields of other crops average lower than on the Norfolk sandy loam. All farming operations center around the production of cotton. Almost no attention is given to improving the productiveness of the soil or to planting the crops and varieties to which it is best adapted.

The price of this land has a wide range on account of its occurrence in association with many different soils. Farms largely or wholly on this type may be purchased for $10 to $75 an acre, depending upon the location, improvements, and distance from market.

The same general practices should be followed in improving this type as in the case of the sandy loams.

Norfolk sand, sandhill phase.—The sandhill phase of the Norfolk sand represents, as a rule, deeper accumulations of sandy material distributed over areas of more uneven topography than in the case of the typical Norfolk sand. It consists of a gray, loose sand grading at about 6 inches into yellow, medium sand which extends to a depth of 3 feet or more. The depth to the sandy clay material is 5 feet or more.

This phase corresponds closely in color, texture, and structure to the typical soil. A distinguishing feature is its light-gray or ashy surface. It includes small areas of typical Norfolk sand and others which have a bright-yellow to orange-colored, loamy sand subsoil.

Nearly all of this phase lies within an area 5 miles square between Wolf, Phils, and Naked Creeks and north of the Cheraw-Gibson Road. A small area occurs southeast of Sandhill Bay near Blenheim. The greater part of the phase is ridgy or rolling. Numerous drainage ways head in or near the phase, but there is no run-off, as the rainfall is absorbed and finds its way downward. Part of it comes to the surface as springs and seepage to form the streams. The drainage in places is excessive.

Less than 10 per cent of this phase is used for cultivated crops. The remainder has a cover of scrub oak and blackjack, with some longleaf pine. The stand of wire grass and broom sedge is scattering. The clearings are for the most part small and located close to cultivated areas of other types. Owing to the deficiency in organic matter and the tendency toward droughtiness the phase is not very productive. Cotton and corn are the only crops grown. The yields are light and uncertain. Land of this type ranges in price from $10 to $30 an acre.

Increased yields of all crops will result from following the plan for soil improvement suggested in the case of the typical Norfolk sand.

NORFOLK COARSE SANDY LOAM.

The surface soil of the Norfolk coarse sandy loam is a loose, gray coarse sand which grades into a subsurface layer of yellow, loamy coarse sand. At a depth of 15 to 20 inches the latter changes into a friable, yellow coarse, sandy clay extending to a depth of 3 feet or more. Material coarser than coarse sand may be present, and rounded quartz gravel occurs in a very few places.

The greatest variation is in the depth to the sandy clay subsoil. In the central and southern parts of the county the type occurs on slopes toward stream terraces or bottoms, while in the Sandhill section practically all of it is rolling, and with this variation the depth of the sandy mantle may range from a few inches to 2 feet or more even within short distances.

The greater part of this type occurs in the drainage basin of Whites Creek in the northern part of the Sandhill section. Elsewhere the areas are comparatively small and widely scattered. An area occurs near Bullards Mill, another about 3 miles southeast of Bennettsville, and several lie 1 to 3 miles north of Everett. Others occur along the slope or break toward the Flatwoods section to the west and southeast of Hebron Church. The areas in the Sandhill section are gently rolling, with a few fairly steep slopes toward the streams. In other sections the type occupies moderate slopes leading to lower-lying soils. Drainage is well established. There is little erosion except during very heavy rains. In places wet spots are caused by springs and seepage. During excessive rains the sandy mantle becomes filled with water and injury to crops results.

In the Sandhill section approximately 75 per cent of the Norfolk coarse sandy loam is cleared and farmed. Uncleared areas have a forest cover of longleaf pine and oak. In the remainder of the county practically all of the type is used for crops. The soil is deficient in organic matter, but it is easily tilled and can be cultivated under a wide range of moisture conditions. It holds sufficient moisture for crops, except in protracted droughts, and is fairly productive.

Cotton leads all other crops in acreage and value. Comparatively little corn is grown. The average yield per acre of cotton is between one-half and three-fourths bale, with a range of one-half to 1 bale. Corn yields 10 to 20 bushels per acre. Tillage operations and fertilizer practices are essentially the same as on the Norfolk sandy loam, and the two soils can be improved in productiveness by the same means.

In the Sandhill section practically none of the type is on the market, as it is held in large tracts. Elsewhere it does not occur in sufficiently large areas to form whole farms, and it sells, according to the value of the associated types, at $50 to $100 an acre.

NORFOLK SANDY LOAM.

The Norfolk sandy loam consists of 6 inches of loose, gray sand which grades abruptly into a subsurface layer of porous, grayish to pale-yellow loamy sand, this being underlain at a depth of 15 to 20 inches by friable, yellow sandy clay. The sandy clay extends to a depth of 3 feet or more.

On the whole this is a fairly uniform type. In the eastern part of the county, where it occurs in association with the Marlboro sandy loam the boundaries are in some cases rather arbitrarily placed, as in approaching the streams the sandy mantle gradually deepens over the typical Marlboro subsoil. An effort was made to class the material as Norfolk sandy loam where this surface mantle exceeded 14

inches in depth. In a very few cases material of sandy texture to a depth of 24 inches is included with the type. Here and there, especially on slopes toward streams in the southwestern half of the county, small rounded gravel may occur. The type includes a few areas of Norfolk fine sandy loam, occurring in association with the Marlboro fine sandy loam between Clio and Tatum. Some patches of Grady and Portsmouth soils also are included.

The Norfolk sandy loam, with its two phases, is one of the most extensive soils in the county. It occurs in all sections, except over the fine-textured Flatwoods and the Peedee River bottom. Only a small acreage of typical material occurs within the Sandhill division. A few areas are mapped on the Peedee River terrace. Some of the more important developments occur in the vicinity of Hebron Church, Clio, and McColl; along Beaverdam Creek, along Crooked Creek from the Wire Road south to Moores Mill, north of Hickson on the Bennettsville & Cheraw Railroad, northeast of Madeline on the same road, about 3 miles north of Bennettsville, and 3 to 5 miles southwest of Bennettsville.

The surface is level to gently undulating, with here and there a short slope toward a stream course or the river terrace. The loose surface material readily absorbs the rainfall and the subsoil permits the excess moisture to find its way downward, at the same time retaining sufficient for crops. Only in infrequent periods of continued heavy rains, as in the summer of 1916, do crops suffer from too much moisture. None of the type needs artificial drainage.

The Norfolk sandy loam is one of the most extensive soil types in the Coastal Plain. In many places it is the dominant type and represents the best land in the locality. In this county it is not a dominant soil over any large area, nor is it the best soil encountered, but it is sufficiently extensive to give it a relatively high agricultural importance. Practically all of the land has been cleared, and at least 95 per cent of it is under cultivation. It was one of the first types to be cleared and farmed. The greater part is well located with respect to transportation and marketing facilities. Good drainage, favorable surface features, and good moisture-holding capacity were factors which influenced in its early development. Like the other types of the Norfolk series it is deficient in organic matter. Tillage is easy and may be carried on under quite a range in moisture content. This is one of the earliest soils in the county. It is regarded as a productive and desirable soil adapted to a variety of crops.

Cotton is planted on approximately nine-tenths of the acreage in cultivation. A little long-staple cotton is grown. Corn ranks second in importance. Wheat, rye, and oats are minor crops. Cowpeas

and other forage crops are grown to some extent. Many farms on this type do not produce sufficient forage for farm use, but the acreage in these crops is greater than in recent years preceding the making of the survey.

Two-horse implements are used to a small extent, mainly in plowing, but most of the work is done with 1-horse implements. Cowpeas are frequently planted in corn, usually at the time of the last plowing, and are mainly cut for hay. Soy beans are coming to be grown in the same way. Oats and wheat are followed either by corn or cowpeas the same season. The fields are kept in continuous cultivation, frequently to the same crops year after year. A few farmers use narrow drills to sow rye in the cotton before picking time. The rye is either allowed to ripen seed or is turned under the following spring. In most cases, however, fields are left bare during the winter.

Formerly heavy applications of an 8–4–4 fertilizer mixture were used, but on account of the scarcity of potash the fertilizers now analyze about 8–4–1, and the application has been reduced in order to prevent excessive growth of weed at the expense of fruit. This has resulted in some decrease in the yields. The acreage applications now range from 600 to 800 pounds, about two-thirds of which is applied at planting time and the remainder later. Nitrate of soda is applied about June 1, ordinarily, at the rate of 150 pounds per acre. Cottonseed meal is in common use as a fertilizer for corn. No fertilizer is used for oats or wheat at the time of seeding, but these crops are fertilized in the spring at the rate of 150 pounds per acre. Some farmers mix their own fertilizers. Stable manure is applied as far as possible to cotton.

Land of the Norfolk sandy loam usually commands a high price. Very little is on the market. The price ranges from $50 to $100 an acre. A few less desirable areas in the Sandhill section or in certain other sections of the county may be purchased at a lower figure.

This type needs the addition of organic matter and nitrogen. These constituents may be supplied by plowing under leguminous green-manure crops. The turning under in the spring of winter cover crops will also assist in supplying organic matter. Crops should be diversified, so that sufficient subsistence products may be grown to meet all the needs of the home and the farm. The use of 2-horse implements should tend to relieve the threatened shortage of labor and also permit deeper and better plowing and more efficient cultivation. There should be more intensive farming of smaller acreages.

Norfolk sandy loam, rolling phase.—The rolling phase of the Norfolk sandy loam is separated largely on the basis of topography,

but in addition it is much less uniform in depth, color, and texture. It grades toward a coarse texture in a number of places. The phase occurs in a sandy region and owing to this and to its topography there is naturally a range in the depth of the sandy mantle, occurring so irregularly or over such small tracts that the differences can not be shown on a map of the scale used. This range is from 10 to 30 inches. The phase occurs in close association with other deep sandy soils of the Norfolk series and with the Hoffman coarse sandy loam, and small areas of those types are included.

All of this phase as mapped lies within the Sandhill section. It also occurs on a few short, narrow slopes in other parts of the county, but these areas were not mapped separately. The most important areas lie south and east of Whiteoak Church, east and southeast of Aarons Temple, and on the North Carolina line about 2 miles east of New Hope Church. The phase covers broadly rolling to rolling and hilly areas and moderate slopes whose drainage is well established. Streams and small draws are more numerous than in areas of the typical Norfolk sandy loam.

The greater part of this soil is in cultivation. The remainder supports a growth of longleaf pine and small oak. The phase is deficient in organic matter and is subject to erosion over cleared areas on some of the slopes, but it holds sufficient moisture in seasons of average rainfall. In places crops suffer from lack of moisture in excessively dry seasons, and in wet seasons too much water may affect crops. As a rule, the slopes are not so steep as to render cultivation difficult.

Cotton is the leading crop. Corn in grown on a relatively larger acreage than on the typical soil. Oats are a minor crop, grown for the most part on the lower slopes where moisture is most abundant. Yields range with the season and the farming methods. On the whole, they are slightly lower than on the typical Norfolk sandy loam. Aside from the necessity in many cases of contour cultivation, and in extreme cases of terracing, the farming methods follow the general plan found on the typical soil.

Norfolk sandy loam, deep phase.—The deep phase differs from the typical Norfolk sandy loam in the depth to the sandy clay subsoil. It consists of 6 inches of gray sand grading into a pale-yellow, slightly loamy sand, which is underlain at a depth of 24 to 30 inches by a friable, yellow sandy clay or heavy sandy loam.

Several small areas of this phase occur, mainly in association with the typical sandy loam. Its surface is level, but drainage is well established. All of the phase is in cultivation to cotton and corn. Yields as a rule are slightly lower than those obtained on the typical soil. Practically the same methods of farming are followed, and the selling value of the land is about the same.

NORFOLK FINE SANDY LOAM.

The Norfolk fine sandy loam consists of a loose, gray fine sand grading at about 6 inches into a pale-yellow, slightly loamy fine sand, which at a depth of 14 to 18 inches rests upon a yellow fine sandy clay. This continues to a depth of 3 feet or more.

Nearly all of this type lies in the vicinity of Clio, where it is associated with the Marlboro fine sandy loam. The surface is nearly level and the drainage is almost entirely through the soil and the underlying material.

This soil is easily tilled and holds moisture fairly well, but it is deficient in organic matter. It responds readily to good farming methods and is regarded as a productive soil adapted to a considerable range of special and general crops.

Cotton is the chief crop. Corn, grain, Irish potatoes, and watermelons are of some importance. The same yields are obtained as on the Norfolk sandy loam.

The price of land of this type is slightly higher than for the sandy loam, owing mainly to its location close to markets. Practically none of it is for sale.

The type is handled in the same way as the sandy loam, and the same suggestions apply in regard to its improvement.

HOFFMAN COARSE SANDY LOAM.

The soil of the Hoffman coarse sandy loam consists of 2 or 3 inches of gray coarse sand underlain by a yellow to pink or pinkish-red, loose coarse sand which continues to a depth of 8 to 14 inches. The subsoil is a fairly friable, hard, brittle, and partly indurated coarse sandy clay ranging in color from faint pink to pinkish red or mottled yellow, red, purple, and white, and extending to a depth of 3 feet or more. The white material is smooth and slick, resembling kaolin. The presence of fine angular quartz fragments is characteristic of the type.

There are a number of minor variations in color and texture. Some small areas of Hoffman sandy loam are included. As the type occupies rather uneven areas in a more or less sandy country there is naturally much variation in the depth of the sandy mantle, which ranges from 1 or 2 inches on small knolls, steep slopes, and eroded areas to 2 feet or more in places favorable to its accumulation. As a rule the sandy material is deeper on the lower part of the slopes.

A few areas of Hoffman gravelly sandy loam are included with this type and shown on the soil map by gravel symbols. This gravelly soil is quite variable in texture and color, especially in the subsoil. It is developed on gentle slopes and on hillsides. It has a low agricultural value, and very little of it is farmed.

The Hoffman coarse sandy loam is confined to the Sandhill section in the northern part of the county. By far the greater part of it lies within the drainage basins of Whites and Phils Creeks, especially along their middle and upper courses. The type occupies more or less irregular slopes leading toward drainage courses, the divides between which are usually covered with deep sandy soils. The slopes range from gentle to moderately steep. Short draws tributary to the streams are fairly numerous. In the forested areas there is little runoff, except on areas of shallow soil, as surface material readily absorbs the normal rainfall. The type is on the whole well drained.

Less than 20 per cent of the Hoffman coarse sandy loam is cropped. The remainder has a forest growth consisting of scattering pine and scrub and blackjack oak. The soil is deficient in organic matter, and extremes of moisture affect crop yields more than on the other sandy loams of the county. The soil in cleared fields on even moderate slopes erodes readily.

Cotton is the leading crop. Corn, vegetables, and fruit are grown to a small extent for home use. Cotton yields about one-third to two-thirds bale per acre, and corn 10 to 25 bushels. The relatively low average yields result in part from the poor farming methods in quite general use. A few farmers by means of heavy fertilization and the plowing under of leguminous and cover crops obtain fairly good yields.

Much of this land is held in large tracts, and very little of it is on the market. It is usually held at a price higher than its agricultural value warrants. The owners have received considerable income from the sale of timber.

All cultivated fields on even moderately steep slopes should be carefully terraced. On slopes of less gradient contouring of the crop rows will be effective in checking erosion. Leguminous and winter-cover crops should be more extensively grown to provide nitrogen and organic matter and to give protection from erosion and leaching.

DUNBAR SANDY LOAM.

The soil of the Dunbar sandy loam is a loose to rather compact, gray sand to slightly loamy sand, 6 to 8 inches deep, underlain by a subsurface layer, 2 to 6 inches thick, of yellow, light sandy loam. The subsoil is a moderately stiff to slightly plastic, heavy, yellow sandy clay which becomes mottled with red and frequently with gray at a depth of about 24 inches. This soil has been classed in some counties previously surveyed as a well-drained phase of the Coxville sandy loam. It is intermediate between the Coxville sandy loam and either the Norfolk sandy loam or the Marlboro sandy loam. It is better drained than the former and not as well drained as the Norfolk

or Marlboro. Where it occurs in association with the Marlboro type the soil is shallower and the subsoil heavier than where the associated type is the Norfolk sandy loam. In the former case the subsurface layer may be entirely lacking or very thin. The heavier the subsoil material, the shallower the depth at which the red mottlings appear.

The Dunbar sandy loam occurs in the flatwoods section where material of medium texture is developed and in the higher lying costal plain where conditions have been favorable for its formation. A fairly large area lies east of Hilson Bay, and others are mapped near the north end of Catfish Bay in the southern part of the county. Aside from the areas located 1 mile or so northwest of Tatum, very little of the type occurs north of a line drawn east and west through Bennettsville.

The surface of this type is practically flat. The greater part of it is adequately drained in normal seasons, as it either occurs on a slight swell or rise in the Flatwoods or its drainage has been improved by ditches dug to drain the associated more poorly drained soils.

Approximately 75 per cent of the Dunbar sandy loam is cleared and farmed. The remainder supports a mixed forest of pine and oak. With the construction of ditches in some areas to insure good drainage, all of the type is cultivable. The soil is easily handled, but it is rather low in organic matter and is only moderately productive.

Cotton leads in acreage. Other crops are corn and oats. Yields range from light to medium, according to the season and the state of cultivation. The farming methods are practically the same as on the associated soils.

Few farms are located wholly on this soil, and its sole value is dependent upon that of the surrounding types.

The two chief factors which reduce yields on this soil are insufficient drainage and the low content of organic matter. In most cases thorough draining of the individual areas can be easily accomplished. Organic matter may readily be supplied by plowing under leguminous, green-manure, and winter cover crops.

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

Mechanical analyses of Dunbar 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.*
242953	Soil	4.6	16.5	7.0	20.4	19.8	27.2	4.6
242954	Subsoil	3.4	9.2	3.6	10.3	12.6	26.4	34.6
242955	Lower subsoil	3.0	8.0	3.0	9.4	9.6	28.2	38.4

DUNBAR VERY FINE SANDY LOAM.

The surface soil of the Dunbar very fine sandy loam is a compact, gray very fine sandy loam, 6 inches in depth. This grades quickly into a stiff, yellow, heavy silt loam to heavy silty clay loam, which at 15 to 20 inches changes to a mottled yellow, red, and gray, tough silty clay extending to a depth of 3 feet or more.

This type is fairly uniform throughout its extent. It grades on the one hand toward its slope phase and on the other toward the Coxville silt loam, according to the thoroughness of drainage. The yellow upper subsoil is the characteristic feature of the type. There is some local variation in the intensity of the red mottling of the lower subsoil, and in some places the gray is quite pronounced. Small areas of Coxville very fine sandy loam and silt loam are doubtless included in the type.

The Dunbar very fine sandy loam is quite widely distributed over the Flatwoods section south and southeast from Bennettsville to the Marlboro-Dillon County line. A small area lies about 2½ miles northwest of Bennettsville.

The surface generally is flat, but a few areas occupy slight rises above the surrounding types. Drainage is retarded by the compact structure and level surface, but the type has better drainage than the Coxville soils.

The Dunbar very fine sandy loam is not an extensive type, but approximately 75 per cent of it is under cultivation. It is practically the only fine textured, strictly Flatwoods type that is cultivated. All of it is susceptible of cultivation. The uncleared areas have been logged off and now support a scattering growth of pine and small oak. Fair yields are produced in favorable seasons. The soil warms up slowly in the spring and can not be handled under a wide range of moisture conditions on account of its tendency to clod and bake. A crust forms on the surface after heavy rains and sometimes interferes with the growth of the seedlings. The soil is deficient in organic matter.

Cotton is the leading crop. Corn and grain are of minor importance. The average yield of cotton is about one-half bale per acre, with a range of one-third to three-fourths bale per acre. Corn yields 10 to 20 bushels per acre, and oats 25 to 30 bushels. Yields may be reduced by late planting on account of slow drainage, by too much moisture during the growing period, or by a lack of moisture during protracted dry spells. The farming methods on this soil are about the same as on the medium-textured better drained upland types.

The price of this land ranges from $25 to $75 an acre, according to the location with respect to markets and shipping points and the character of the associated types.

Better drainage and an increased content of organic matter are the greatest needs of the type. There is usually sufficient slope to enable the installation of open ditches and tile drains at moderate cost. Crops may be grown profitably without artificial drainage, but the latter insures higher yields. The growing of leguminous crops between the rows of other crops and in rotation would add much-needed nitrogen and if the entire crops were turned under would also greatly aid in maintaining an adequate supply of organic matter. Cover crops of winter grain may be grown with profit.

Dunbar very fine sandy loam, slope phase.—The Dunbar very fine sandy loam, slope phase, consists of about 5 inches of compact, yellowish to slightly brownish gray very fine sandy loam, underlain by a stiff, compact, yellow silty clay which is usually intensely mottled with red below a depth of 15 to 20 inches. The latter layer has a more brittle structure than where these mottlings are lacking.

In places the sandy surface material has been partly or entirely removed, so that the soil has a brownish color or the subsoil material is at the surface. Numerous patches of this character occur over the more sloping part of this phase. There is a tendency for fine sandy material to accumulate on slopes and in places the phase approaches a brown fine sandy loam, underlain by a brown to slightly reddish-brown silty clay which usually shows some yellow and grayish mottlings in the lower portion of the 3-foot section. In two or three areas small rounded pebbles of accretionary origin are abundant.

The greater part of this phase occurs 4 to 10 miles southeast of Bennettsville in the vicinity of Hagins Prong, Cottingham Creek, and Three Creeks. The surface is gently rolling to sloping. The drainage is largely in the form of surface run-off, as the surface soil is compact, and internal drainage is slow.

This phase represents the best-drained portion of the type, and practically all of it is in cultivation. It is a good soil but is rather deficient in organic matter, and it holds moisture only moderately well. The phase is planted almost exclusively to cotton, corn being grown on only a small acreage. The yields are medium to light, though slightly higher than on the typical Dunbar very fine sandy loam. The farming methods are the same as on the typical soil and the phase can be improved by the same means.

The following table gives the result of mechanical analyses of samples of the soil, subsurface, and subsoil of the Dunbar very fine sandy loam:

Mechanical analyses of Dunbar very 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.*
242956	Soil	0.2	0.9	0.9	36.4	29.2	25.7	6.4
242957	Subsurface	.0	.4	.4	21.9	21.8	30.5	24.7
242958	Subsoil	.0	.2	.4	18.5	19.2	25.1	36.1

DUNBAR SILT LOAM.

The Dunbar silt loam consists of about 5 inches of compact, gray to brownish-gray silt loam, underlain by a stiff yellow to brownish-yellow silty clay loam which at about 20 inches changes to a tough, yellow and red mottled silty clay extending to a depth of 3 feet or more. In places gray mottlings appear, especially in the lower part of the 3-foot section. Aside from the medium-gray color of the immediate surface and the pale to grayish yellow color of the shallow subsurface layer in the timbered areas, this type is remarkably uniform in color, texture, and structure. It grades in places toward the Coxville silt loam, according to the character of its drainage.

One area of Dunbar silt loam, 3¼ miles long and nearly 1 mile in width, lies 2 to 5 miles south of Bennettsville, west of the Blenheim Road. The type is associated with the Dunbar very fine sandy loam in occurrence. It has a distinctly flat surface, and there is little run-off. The internal drainage is slow on account of the compact surface and the dense structure of the subsoil. The greater part of the type is not well enough drained for successful crop production without artificial drainage.

Only a few acres of this soil are in cultivation. Over 95 per cent supports a forest growth composed mainly of pine. Cotton is practically the only crop grown, and the yields are light and uncertain. The soil warms up slowly in the spring, and under natural conditions crops must be planted late. It is deficient in organic matter, and clods unless worked under the proper moisture conditions. The type is farmed in the same way as the Dunbar very fine sandy loam, and has about the same range in value. It is adapted to the same crops, and may be improved by the means suggested for that type.

COXVILLE SANDY LOAM.

The Coxville sandy loam consists of 6 inches of medium-gray sand to loamy sand, grading into a pale-yellow, compact sandy loam to sandy clay loam which is underlain at about 12 inches by a stiff and tough, yellow and gray clay loam to clay, showing red mottlings below a depth of 24 inches.

This type is not extensive, as the Coxville material in the Flatwoods is for the most part of fine texture. The areas are generally small. There is practically none of this soil in the northern half of the county. Several areas are located in the immediate vicinity of Bennettsville, and 4 to 5 miles east and southeast of Clio. Three lie 4 to 5 miles southwest of Bennettsville.

The surface of this type is flat. In places it appears to lie slightly lower than the surrounding soils. All of it is poorly drained, though drainage is better than on the extensive areas of other Coxville types.

Less than 20 per cent of the type is used for the production of crops. The remainder supports a forest of mixed pine and oak. Practically all of the merchantable timber has been removed. Native grasses are usually abundant. The type is considered as not adapted to profitable farming until thoroughly drained. Cotton, corn, and oats are the only crops grown, and as a rule the yields are light and uncertain.

The price of this land is largely based on the prospective value of its timber crop. It is sold in conjunction with the surrounding types.

The success attained in farming some small artificially drained areas indicates that the improvement of this soil would be profitable. Improved tracts of similar soil in other sections of the Coastal Plain are successfully farmed.

COXVILLE SILT LOAM.

The surface soil of the Coxville silt loam is a gray silt loam about 5 inches deep. The subsoil is a stiff, very pale yellow to mottled pale yellow and gray silty clay loam to silty clay, underlain at about 12 inches by a tough, mottled red and gray silty clay which continues to a depth of 3 feet or more. In places yellow appears as a minor color in the lower subsoil.

The chief color differences in this soil are due to the intensity of the red mottling. In some places there are only occasional red mottlings and in others they are abundant. As mapped the type includes areas which have a very fine sandy loam texture but are otherwise typical. Since nearly all of the type as mapped is unimproved cut-over land, there are doubtless a few small included areas of Dunbar silt loam or very fine sandy loam.

The largest developments of Coxville silt loam lie to the south of Dunbar. The type occurs throughout the flatwoods section south and southeast of Bennettsville. Its surface is flat, and the drainage is very poor, especially in the larger areas where no attempt has been made to drain them artificially. Water stands on the surface in the winter and spring and after heavy rains in other seasons. A few streams head within areas of this type but they have such a sluggish

current that they are not effective in taking care of the excess water. Part of the rainfall is taken up by the vegetation, part evaporates, some drains away slowly through the streams, and a very little finds its way downward through the impervious subsoil and substratum.

The silt loam is the most extensive type of the Coxville series. Only a few small tracts of a few acres each are in cultivation, on or near the boundaries between this and better-drained types. The merchantable timber has been removed and the present growth consists of small pine, a few gums, and now and then a small oak. Grass grows abundantly. It is burned over each season, but the land is used very little for pasture. The soil must be worked under the proper moisture conditions or it clods and bakes. It is rather difficult to work with the usual farm implements and stock, and it is not safe for profitable farming until artificially drained, as scarcely a season passes when crop yields are not decreased to a greater or less extent by late planting or by an excess of moisture in the growing season. Cotton and corn are grown on the small acreage in crops. The yields are rather light and uncertain. This land is held in large tracts and there is no demand for it for farming.

Soil of similar character has been reclaimed in other sections of the lower Coastal Plain and used in the production of a number of crops. Drainage of soil here is practicable, but long canals, connecting with streams far enough down their course to give sufficient fall, and frequent lateral ditches are necessary to drain the type sufficiently for cultivated crops. In addition it will be necessary to use liberal applications of lime to sweeten the soil and improve its physical condition. Vegetable matter should be turned under to increase the normally low organic-matter content. When this soil is thoroughly reclaimed profitable crops of corn, cotton, oats, forage, strawberries, and other crops may be grown.

COXVILLE CLAY LOAM.

The surface soil of the Coxville clay loam is a compact, sticky, gray to almost black, heavy silt loam to clay loam, 4 to 5 inches deep. The subsoil consists of a stiff to tough, mottled gray, yellow, and rusty-brown silty clay, which, at a depth of 12 inches rests upon a tough, mottled gray and red silty clay extending to a depth of 3 feet or more. The mantle of soil material is characteristically shallow, frequently only 2 or 3 inches deep, and often the surface material is a sticky silty clay loam or even approaches a very fine sandy loam. Practically all of this type is wooded and has a darker surface soil than the other Coxville types.

The Coxville clay loam occurs in the extensive Flatwoods area southwest and south of Dunbar. It has a flat surface and is very

poorly drained. Water stands on the surface for long periods in the spring and after heavy rains, as there is practically no run-off and the impervious character of the subsoil does not permit the downward movement of water.

All of this type has been logged off in the last few years. It now has a scattering growth of small pine and occasional gum. Native grasses grow where the stand of timber permits. Some of this soil is in cultivation, but artificial drainage is necessary before the type can be successfully farmed, and there is no demand for land of this character for agriculture.

Drainage should be accomplished by a system of main canals and lateral ditches, constructed to drain a large area. Reclamation is practicable if attempted on a large enough scale. Liming would greatly improve the physical condition of the type. The deficiency in organic matter should be met by the use of stable manure or the plowing under of green-manure crops. When this soil is thoroughly reclaimed corn, oats, and forage crops will be successful on it.

GRADY LOAM.

To a depth of about 6 inches the Grady loam is a medium to dark gray loam to silt loam. The subsoil is a light-gray, sticky to somewhat plastic, heavy sandy clay to clay loam, underlain at a depth of 15 to 20 inches by a mottled gray and ocherous-yellow, slightly plastic to tough clay loam to clay. Red splotches frequently occur below a depth of 20 to 24 inches.

All of this type occupies depressions or sinks, and it has a marked uniformity in texture and structure of subsoil, but on the basis of subsoil color and drainage the areas mapped may be separated into three general classes: Those which closely resemble the Portsmouth series except in subsoil structure; those closely conforming to typical Grady loam; and those which are moderately well drained internally and closely resemble Dunbar material in character of subsoil. The first areas are the least well drained; they have a fairly black soil and sticky or waxy to tough, gray subsoil with few or no yellow mottlings. The last consists of a few inches of medium to dark gray soil underlain by a yellowish light clay loam, streaked with gray in places, which rests upon a yellow, fairly crumbly clay loam containing splotches of red and some gray mottling. The red material seems to be partially indurated and imparts to the lower subsoil its crumbly structure. A few small areas have a brownish soil which rests upon yellow or reddish material of friable structure. The natural drainage of all the areas of this last class is sufficient for crops.

The type is influenced to some extent by the character of the associated soils. The variations range all the way from a sandy loam texture near the margin of the depressions to silty loam or silty clay

loam near their center, and are especially noticeable in the small to medium areas.

The Grady loam has a wide distribution over all parts of the upper Coastal Plain except the Sandhill section. It is especially abundant over the Marlboro Plain in association with the soils of the Marlboro series. It covers the level floors of depressions which lie 2 to 10 feet below the surrounding country, and in most places has no natural surface drainage. The internal drainage ranges from very poor to fair. A large part of the type is artificially drained by ditches connecting with the natural drainage ways.

Over 75 per cent of the small to medium-sized areas in association with the Marlboro sandy loam and fine sandy loam have been cleared and ditched and are planted to crops. The remainder is covered with a forest of pine and other trees, with an undergrowth of vines and brush. The agricultural importance of the type is due in part to its use for certain crops to which the sandy uplands are less well adapted. Crops generally do not suffer from too much moisture where drainage has been given careful attention. The soil contains plenty of organic matter, and also has received the fertilizing elements leached from the fertilizer, which have been applied to the higher lying soils.

Oats and corn are the chief crops. Cotton, wheat, rye, and forage crops are also grown. The yields vary with the thoroughness of the artificial drainage. The highest average yields of oats in the county are obtained on this type. In some cases the areas are farmed by themselves and again, especially in the case of small ones, they are farmed as parts of fields with other soil types. Frequently their boundaries are marked by the outlines of the grain fields. Small grains are sowed without fertilizer, but nitrate of soda is applied in the spring. Lime is applied by a few farmers.

This type is sold with the associated soils, and on this account much of it is rather high in price.

The productive capacity of this type may be increased by giving more attention to drainage. The ditches should be kept free from brush and briers and sufficient laterals dug to drain each area thoroughly. Considerable land is wasted by the use of open ditches, and the expense of tiling is justified not only by the increased acreage available for crops but also by the decreased cost of maintaining the ditches. All of the type should be heavily limed.

GRADY CLAY LOAM.

The Grady clay loam consists of about 6 inches of medium-gray to nearly black silty clay loam or clay loam underlain by a light-gray to nearly white silty clay or clay which usually has yellow and red mottlings in the lower 12 inches of the 3-foot section. The sub-

soil is sticky to slightly plastic when wet and tough and hard when dry. The type has the same general range in color, texture, and structure as the Grady loam.

The Grady clay loam occupies medium to rather large depressions in the upper and lower Coastal Plain sections. The surface is flat and the drainage as a rule poorly established.

Very little of this type is under cultivation. The forest, which covers much of it, consists of pine and occasional gum trees, with a varying undergrowth of vines and shrubs. The soil contains considerable organic matter, but it is not highly regarded for agriculture. Its sale value is the same as that of the associated types.

This soil is not safe for farming without artificial drainage. It can be drained by digging ditches to connect with streams. Heavy applications of lime should also be used. Where thoroughly reclaimed the type would be adapted to the production of oats and corn. The soil is somewhat difficult to handle.

PORTSMOUTH SANDY LOAM.

The surface soil of the Portsmouth sandy loam consists of a dark-gray to black loamy sand to sandy loam, 6 to 10 inches deep. The subsoil is a sticky sandy loam to an average depth of 20 inches where it is underlain by a slightly plastic, gray sandy clay, frequently mottled with yellow. In places the subsoil is a gray to gray and yellow mottled, stiff sandy clay loam to clay. In a few areas the type has a fine mucky loam texture in the surface soil.

In some of the bays, particularly in part of Mossy Ocean and Sandhill Bay, Portsmouth sand is included with the sandy loam, owing to its small extent. This soil consists of black loamy sand underlain by gray sand. None of it is cultivated. Its agricultural value is low as compared with that of the sandy loam.

The Portsmouth sandy loam although inextensive has a fairly wide distribution. The areas are for the most part small. The largest area is mapped in Sandhill Bay. The type occupies depressions, approaches to the stream courses, or small flats at or near the heads of drainage ways. The surface is either flat or very gently sloping, and natural drainage is poor. Almost all the type is so located that it receives seepage water from other soil types.

Practically none of this soil is in cultivation. It supports a forest growth of pine, gum, and water-loving oaks, together with vines and brush. Grass is abundant where the forest is not too dense.

Fairly good yields of oats, corn, and forage crops may be obtained where the type is thoroughly drained and otherwise improved.

PORTSMOUTH LOAM.

The Portsmouth loam consists of a dark-gray to black, light loam to silt loam, 6 to 10 inches deep, underlain by a gray sandy loam to

sandy clay or clay extending to a depth of 3 feet or more. As a rule a few yellow mottlings appear in the lower part of the 3-foot section. The soil has an abundance of organic matter. It is friable when dry but in undrained areas is sticky and plastic.

Where the type occurs in especially small bodies there is usually a narrow belt of more or less sandy material surrounding the loam area. Frequently gray sand immediately underlies the dark colored surface soil and this in turn rests upon gray sandy clay. In certain areas the soil is a silt loam, as in the "bays" north and east of Hilson Bay in the southern part of the county. These have about 10 to 12 inches of dark-gray, mucky silt loam resting upon a plastic, gray and yellow mottled clay loam to clay. Many small areas of this type have been cleared, drained, and cultivated for years; the soil has lost its typical black color and is now dark gray.

The Portsmouth loam has a wide distribution south of the Sandhill section. It occupies either depressions from a few to several hundred acres in extent bordered on one or two sides by sand ridges, or gladelike areas around the heads of streams. Where it occurs in depressions water drains slowly through the underlying material. Where the areas are connected with drainage ways the water finds its way slowly to the streams as well as through the underlying material. The type receives seepage water from the adjoining soils, and in places is semiswampy. Some provision has been made for draining many of the smaller areas and a number of the larger ones by connecting them with open ditches to a natural drainage channel. Some of the areas are in this way well drained and others partly drained.

The artificially well-drained areas have a high agricultural value on individual farms, owing to their adaptation and use for grain and forage crops. Approximately 20 per cent of the type is cleared and farmed. The remainder has a forest growth of pine and gum, with an abundant undergrowth of briers and brush.

Oats, wheat, and corn are the chief crops. Cotton is grown to a small extent. Where the fields are thoroughly drained crops give good yields. Some of the unimproved areas have a valuable stand of timber. Most areas are too small to have a separate sale value, and constitute parts of farms which include a much larger acreage of higher lying well-drained soils.

The adaptation of this type to the profitable production of certain crops justifies the cost of drainage. Much of the type is closely associated with the best soils of the county, and its reclamation is essential to efficient farming on those types. The change from open ditches to tile drains would make more land available for crops. The use of lime will be found beneficial.

AMITE LOAMY SAND.

The soil of the Amite loamy sand is a loose, brown to reddish-brown loamy sand about 10 inches deep. The subsoil is a loose, dark-red to reddish-brown loamy sand or brown sand extending to a depth of 3 feet or more. Both soil and subsoil contain some finely divided mica. A substratum of compact, reddish sandy clay underlies the type at depths slightly exceeding 3 feet. On certain slopes toward the lower lying soils the subsoil is redder than typical.

The largest area of Amite loamy sand occurs on the Peedee River terrace one-half mile north of Kollock. Three other areas lie near the river in the northwestern corner of the county. Several bodies occur in Welsh Neck, about one-half mile east of Society Hill Ferry.

The surface of this type is level to gently undulating. It lies 10 to 40 feet above the first bottom, but there is no run-off. The porous subsoil gives good internal drainage, yet retains sufficient moisture to carry crops over ordinary periods of drought.

This is an inextensive soil but one of local agricultural importance on farms on the terrace north of Kollock. Nearly all of it is in cultivation. The type is easily tilled under a wide range in moisture content. Fertilizers do not readily leach beyond the zone of root development. The soil has a fair content of organic matter, and is regarded as productive and adapted to the general farm crops. Cotton is the leading crop, with corn and oats next in importance. The greater part of the type is well farmed and gives good yields. Cotton averages about three-fourths bale per acre, oats about 20 bushels, and corn about 25 bushels.

Land of this type of soil can be bought for $50 to $80 an acre.

The Amite loamy sand is farmed in much the same way as the sandy loam. The type can be improved in the way suggested in the discussion of the sandy loam members of the series.

AMITE SANDY LOAM.

The Amite sandy loam consists of 6 to 10 inches of brown to slightly reddish-brown, mellow sandy loam, underlain by brownish-red to red, slightly sticky, compact, heavy sandy clay or compact, friable clay to a depth of 3 feet or more. The soil has a rich-brown color under all moisture conditions. The subsoil is without mottlings. Clay particles cling to the surface of the sand grains in a charcteristic manner. Included with the type are small bodies of Amite fine sandy loam, the largest of which lies about 2 miles west of Drake.

In places the soil is as much as 14 inches deep and overlies a subsoil of reddish, friable sandy loam. In places adjacent to the first bottoms, especially in the northwestern corner of the county where the terrace is narrow and somewhat eroded, both soil and subsoil show considerable more reddish color than is typical.

Several areas of Amite sandy loam, ranging in size from a few acres to several hundred acres, occur on the extensive Peedee River terrace, for the most part on the side toward the river. Its most extensive development is in the vicinity of Kollock. The type generally lies 10 to 40 feet above the flood plain, but in the northwestern corner of the county where the flood plain is lacking it lies as much as 60 to 70 feet above the stream. The surface is level to very gently undulating. Where the terrace is narrow and high a slightly more uneven topography exists. The rainfall quickly finds its way downward through the type, so that it is always well drained, and even high overflows do not reach it.

This type is regarded as one of the best of the terrace soils and practically all of it is in cultivation. It is naturally productive, holds sufficient moisture, and is easily tilled. It warms up early in the spring.

Cotton is by far the most important crop. Corn is of minor importance. Oats and wheat are grown on a small acreage, and some other crops are produced for home use. Yields on this type are little affected by the distribution of the rainfall. Cotton yields from two-thirds to 1 bale per acre. A yield of 35 bushels of corn per acre is not uncommon. Oats yield about 25 bushels per acre.

The Amite sandy loam is handled in much the same way as the best of the upland types, and it can be improved by the same means. Cotton is the only money crop and in some cases the feed and forage crops are not sufficient to supply the farm demands. Medium to heavy applications of fertilizer are used for cotton, and a less amount for corn and grain.

Very little of this type is for sale by itself. The price ranges from $50 to $100 an acre.

Amite sandy loam, low-terrace phase.—The Amite sandy loam, low-terrace phase, consists of 6 to 8 inches of brown, sandy loam, underlain by brownish-red, compact clay to a depth of 3 feet or more. In places fine sandy loam of light-brown or grayish-brown color is encountered. In some rather shallow soil areas the soil has a slightly reddish color.

The Amite sandy loam, low-terrace phase, occurs in the Peedee River bottom from Gardners Bluff southward to the Dillon County line. It occupies scattered areas ranging from a few to several hundred acres in extent, on slight rises or swells, locally known as islands, lying 1 to 5 feet above the bottom lands and 15 to 20 feet above the river. In places a more or less distinct drop or terrace line marks the river side of these areas. The surface usually is very gently sloping or undulating, but is in a few cases level. Drainage is well established, as the subsoil permits the downward movement of water. The phase is subject to short periods of overflow, though

these may not occur every year. This is one of the first soils to be freed from flood waters and it quickly drains sufficiently to allow cultivation.

The Amite sandy loam, low-terrace phase, was one of the first types to be cleared and cultivated, and practically all of it was in cultivation before the Civil War. At that time a large part was more or less completely protected from overflow by levees, which are now broken in many places. At present not more than one-fourth of the type is used for crops. The remainder has a scattering growth of old-field pine and brush, with an abundance of grass. The soil is productive and easily tilled, but the liability to overflow and the comparative inaccessibility of much of it retard its more extensive use. Cotton, corn, and grain are grown to a small extent. The uncultivated areas afford pasturage. A small tract in alfalfa is giving satisfactory results. Under favorable conditions good yields of crops are obtained on this soil, but the average yield is moderately low on account of the occasional loss or damage by overflows.

This phase is handled in the same way as other more extensive soils. A large part is farmed by tenants and it is planted to the same crop year after year. Less fertilizer is used than on the upland types of similar character.

The land is owned in large tracts which include mainly timbered parts of other types. Its selling value ranges from $25 to $50 an acre.

The construction of levees and roads is necessary to insure the more extensive use of this soil. Alfalfa seems to do well when not injured by overflows.

CAHABA CLAY LOAM.

The Cahaba clay loam consists of 3 or 4 inches of brown silt loam to silty clay loam underlain by a tough, brown to reddish-brown silty clay or clay which at about 20 inches changes to a slightly friable or brittle, yellowish-brown to brown silty clay, faintly mottled with yellow. This silty clay extends to a depth of 3 feet or more. In some places the brown to reddish-brown subsoil material is exposed and forms conspicuous spots in fields; in others there is a shallow mantle of gray silt loam on the surface.

This type occurs for the most part on the river side of the Peedee River terrace. Its surface is sloping or undulating, depending upon the distance back from the first bottoms. It lies 5 to 20 feet above the first bottoms and is not overflowed. The run-off is rather excessive on account of the shallow, fine-textured soil and the compact structure of the subsoil. The internal drainage is poor.

The Cahaba clay loam is an inextensive soil, but all of it is cleared and either is now or has been under cultivation. Areas here

and there appear to have been at least temporarily abandoned and have a growth of grass, weeds, and brush. The soil is difficult to handle, as it clods badly and bakes after rains. It is deficient in organic matter and has a tendency to erode during heavy rains.

Cotton is the leading crop. Corn is grown to a small extent. The soil is farmed in conjunction with the surrounding types and the yields have practically the same range as on the Kalmia very fine sandy loam and silt loam. The farm methods and fertilizer practice are practically identical with those in common use upon other terrace types. The price of this lands depends largely upon that of the associated types. Much of it lies a considerable distance from the central marketing points.

KALMIA SANDY LOAM.

The Kalmia sandy loam consists of 6 inches of light to medium gray sand grading into a pale-yellow, slightly loamy sand which is underlain at 15 to 20 inches by a light to pale yellow, stiff sandy clay, usually mottled with gray in the lower part, and in places with red, but the latter is not as common as in the heavier textured types of the series.

In places the type as mapped grades toward the Myatt sandy loam as the drainage becomes less thorough. Several fairly small areas of Kalmia coarse sandy loam are included, mainly where the streams emerge from the uplands to the terraces. In places the sandy clay subsoil is not encountered above 30 inches, and in a few instances small areas which have a loamy sand as the deep subsoil have been included.

The Kalmia sandy loam is the most widely distributed of the terrace types. It occurs in disconnected areas of varying size on the upland side of the Peedee River terrace from a point near Kollock to a point near Brownsville in the southern end of the county. It is more abundant above Marlboro than below. In addition the type is encountered in isolated areas along Crooked and Three Creeks, Gum Swamp, and the Little Peedee River.

Areas of this type have a level terrace topography, relieved only by slight swells and low, poorly drained spots. They lie 5 to 20 feet above the first bottom, and are moderately well drained, as the soil readily absorbs the rainfall and water does not stand on the surface after rains. The position of the type adjacent to the uplands in many cases makes it the recipient of seepage water, causing wet areas too small to map as separate types. The water table appears to be comparatively close to the surface during the greater part of the year.

A smaller percentage of this type is in cultivation than of the Kalmia fine sandy loam or very fine sandy loam. The uncleared

areas support a growth of pine, oak, and other trees. Grass is fairly abundant. Soil, topographic and drainage conditions are in general favorable for the development of this soil, but to a certain extent this has been retarded by its location. In agricultural value it is comparable to the Dunbar sandy loam of the uplands. The soil has a rather small content of organic matter, but it is easily tilled and is moderately productive in favorable seasons.

Cotton is the leading crop. Corn follows in importance. Other crops are grown to a small extent for family use. Practically all of the farming is done by tenants. Yields compare favorably with those obtained on most of the other terrace soils but are low in comparison with those of the better farmed and more productive upland types. In wet seasons yields are usually light. Cotton yields from one-third to three-fourths bale per acre. Farm practices follow the same general plan as on the upland soils of the same texture.

This soil is sold in large tracts in which several soil types are represented. From $25 to $75 an acre probably represents its value.

KALMIA FINE SANDY LOAM.

The Kalmia fine sandy loam consists of a gray fine loamy sand, 6 inches deep, grading into yellow fine sand, usually slightly loamy, which extends to a depth of 15 inches. The subsoil is a rather brittle, yellowish fine sandy clay. Red and gray mottlings frequently appear in it below a depth of 24 inches and continue to 3 feet or more. The only variations in this type consist of gradations toward adjoining finer or coarser soils and occasionally greater depth of the gray surface soil, which in places rests directly upon the subsoil without the intervening subsurface layer.

This is the least extensive of Kalmia types. It occurs in isolated areas on the Peedee River terrace, mainly between Madeline and Three Creeks. The surface is level to slightly undulating, the latter topography occurring only where the type is cut by drainage ways or borders the river bottom. The surface soil quite readily absorbs the normal rainfall, but internal drainage is somewhat restricted by the subsoil structure. On account of its position it is better drained than much of the Kalmia sandy loam.

Approximately 50 per cent of the Kalmia fine sandy loam is in cultivation. The remainder supports the mixed timber growth characteristic of the cut-over terrace lands of similar character. It is regarded as a moderately productive soil when well managed, although deficient in organic matter. It is easily tilled.

Cotton is the chief crop. Corn, vegetables, and forage crops are produced on small tracts for home use. Uncleared areas afford some

pasturage. The yields, methods of farming, and fertilizer practice are practically the same as on the similar-textured soils of the uplands.

The location and the percentage of improved land on the associated types largely determine the sale value of this land. The range is from $35 to $50 an acre.

KALMIA VERY FINE SANDY LOAM.

The Kalmia very fine sandy loam is a compact, gray very fine sandy loam 5 to 6 inches deep, passing abruptly into a stratum of moderately friable though compact, yellow clay loam to silty clay loam, forming the upper subsoil. At 18 to 20 inches the latter rests upon a tough and stiff, yellow silty clay to clay, mottled with red and some gray, which extends to a depth of 3 feet or more. While the surface soil of cultivated areas is prevailingly gray, wooded areas have a very thin layer of medium-gray soil with a yellow to pale-yellow subsurface layer. In some places small areas approach the Cahaba very fine sandy loam in character, and in other places, under opposite conditions, the Leaf silt loam.

The very fine sandy loam is the most extensive type of the Kalmia series. The largest areas lie near Marlboro and near Genoa. The type occupies a level position on the Peedee River terrace from 10 to 25 feet above the flood-plain, from which it is separated by short slopes. The type is moderately well drained during the greater part of the year, although in common with other level terrace types which have heavy and dense subsoils, the surface and internal drainage is somewhat slow after heavy rains. The type receives little or no seepage from the uplands and is free from overflow.

Over one-half of this soil is in cultivation. The remainder comprises cut-over land upon which the timber growth is mainly small pine and post oak. The original forest cover was either almost wholly shortleaf pine or mixed shortleaf and longleaf pine. The soil is deficient in organic matter, and it is harder to cultivate than the coarser types. It warms up slowly in the spring. It is regarded as of low to medium productiveness under the prevailing methods of farming.

Cotton is the chief crop. Corn and other crops are grown only on small acreages for home use. The average yield of cotton is one-half bale per acre. The yield ranges with the season but seldom exceeds three-fourths bale per acre. Corn gives 10 to 25 bushels per acre. The yields seem to be readily affected by the character of the season.

In general, farming operations are about the same as on the more extensively utilized upland types, but this soil, on the whole, is less

well farmed. Nearly all of it is in the hands of negro tenants who use 1-horse implements. Much of the type has been in continuous cultivation for many years without any effort to improve or even to maintain its productiveness.

This type is owned for the most part in large tracts, and few sales are made. It is held at from $25 to $50 an acre.

The low organic content of the soil should be increased by turning under green crops, either leguminous or cereal cover crops. Lime should be used in connection with green manuring. The depth of plowing should be gradually increased, and crops should be given more efficient shallow cultivation. Winter cover crops should be grown to prevent leaching during the winter months. Farmers should diversify crops in order to produce sufficient forage and feed for home use.

KALMIA SILT LOAM.

The Kalmia silt loam is a gray to yellowish-gray, compact silt loam 6 inches deep. Below this stratum is a layer of stiff, yellow clay, forming the upper subsoil, which is frequently faintly mottled with gray. At 15 inches the mottling is more prominent, and it increases with depth, the lower subsoil being a mottled yellow and gray, stiff clay, with here and there splotches of red.

In the virgin areas the surface material is for the most part a yellow silty clay loam which works up into a gray to yellowish-gray silt loam upon cultivation. Small eroded spots may occur in fields that have long been under cultivation. Here the surface soil is very thin or entirely lacking, and the spots have the appearance of Cahaba clay loam but are too small to show on the map. Some small, less well-drained areas grade toward the Leaf silt loam. On the whole, this is a fairly uniform terrace type, comparable to the Dunbar silt loam of the uplands.

The Kalmia silt loam occurs mainly in two sections on the Peedee River terrace, one about 2 miles east of the Cheraw Bridge and the other 2 to 5 miles southwest of Brownsville. Small areas occur elsewhere within the terrace. The surface is characteristically level, with a fairly abrupt slope toward the Peedee River bottom, 10 to 20 feet below. The position of the type on the river side of the terrace gives it moderately good drainage, notwithstanding the compact structure of the subsoil and the level surface. It is not subject to overflow.

Less than one-tenth of the Kalmia silt loam is used for crops. The remainder has been logged off and now supports only a scattering growth of pine and small oak. Grass is fairly abundant. The soil is deficient in organic matter and somewhat difficult to handle.

It warms up slowly in the spring and clods badly unless worked under the proper moisture conditions. Cotton is the chief crop. The yields are moderately light and rather uncertain. Corn is also grown. The same type affords some pasturage. This soil is farmed in the same way as the other terrace soils, and the methods are frequently inefficient.

The Kalmia silt loam is owned in large tracts. It is held at $25 to $50 an acre.

MYATT SANDY LOAM.

The soil of the Myatt sandy loam is a light sandy loam about 6 inches deep, ranging from dark gray in virgin tracts to medium gray in cultivated areas. The subsoil is a yellowish-gray, or gray streaked with yellow, light sandy loam underlain at a depth ranging from 12 to 20 inches by a gray somewhat plastic and sticky sandy clay, mottled with yellow and rusty brown, extending to a depth of 3 feet or more. The color changes are gradations, but the textural change between upper and lower subsoil is fairly abrupt. The type grades toward a fine sandy loam in many places, and such areas have a fine sandy clay subsoil. It is intermediate in character between the Kalmia and Okenee sandy loams.

The Myatt sandy loam is confined mainly to the Peedee River terrace. A few small areas occur along the larger interior streams, such as Gum Swamp and Little Peedee River. The surface is usually level, but in places the type has a slightly depressed position with respect to other terrace types. The surface drainage is inadequate, but the subsoil allows fairly good internal drainage when means have been provided for removing the surplus surface water.

This type is comparatively inextensive, and very little of it is in cultivation. It supports a mixed forest growth. The soil carries a medium amount of organic matter. It warms very slowly in the spring, and is not regarded as a safe soil for farming until drained. Cotton and corn are almost the only crops grown. In favorable seasons the yields about equal those obtained on the Kalmia soils. Farming methods follow the same general plan as on the other terrace soils.

This soil is always included in farms with other types, and the character of the surrounding land largely determines its price, which probably ranges between $25 and $50 an acre.

Drainage is the first requisite in the improvement of this type. Artificial drainage is feasible in most cases, as the areas lie in such a position that the ditches would be comparatively short and shallow. Liming would be beneficial. When this soil is thoroughly reclaimed all the common crops can be profitably grown under good farming methods.

LEAF SANDY LOAM.

The surface soil of the Leaf sandy loam is a gray, medium sand to a depth of 6 inches, underlain to 12 inches by a pale-yellow subsurface layer of loose, light sandy loam. The subsoil is a mottled yellow, red, and gray stiff and tough clay extending to a depth of several feet.

Variations in this type are mainly in the depth to the heavy subsoil material, which is frequently only 6 to 9 inches below the surface. In an area southwest of Drake, which is subject to overflow during excessively high floods, the soil closely resembles the Chastain sandy loam.

The Leaf sandy loam is the dominant soil type over a section of the Peedee River terrace, about 3½ miles in length and over 1 mile in width, between Hickson and Everett on the Bennettsville & Cheraw Railroad. The surface is distinctly level, closely resembling the flatwoods section of the uplands. The type is traversed by several streams whose bottom lands are about 5 feet below its level. On account of its flat surface and relatively impervious subsoil drainage is very slow, and water stands on the surface after heavy rains.

Practically none of the Leaf sandy loam is cleared and in cultivation. All of it has been logged off, and now supports scattered small pine, gum, and scrubby oak. Grass is abundant. Farming development has been retarded by inadequate drainage. The soil is comparable in character and agricultural value to the Coxville sandy loam of the uplands. Cotton is the only crop grown; it gives medium to light yields. The soil is farmed in the same way as the Kalmia sandy loam.

LEAF SILT LOAM.

The soil of the Leaf silt loam consists of 3 to 4 inches of gray silt loam underlain by a subsurface layer of heavy silt loam, light yellow or yellow faintly streaked with gray, approximately 4 inches thick. The subsoil is a tough, stiff, gray clay, mottled with red and yellow, which continues to a depth of several feet. The textural change between soil and subsoil is abrupt, but the color changes gradually, the red appearing at different depths and infrequently not at all.

The variations in this type are due mainly to differences in the depth of the surface soil. An extensive area south of Brownsville mapped with this type should really be classed as a silty clay loam, as the silt loam mantle seldom exceeds 3 inches in thickness. Here, too, the red subsoil mottlings are inconspicuous or wholly lacking, although the material has all the other characteristics of the typical Leaf subsoil.

The Leaf silt loam is one of the most extensive and widely distributed soil types on the Peedee River terrace. It occurs more extensively in the southern than in the northern half of the terrace. It has a flat surface in which drainage ways have not yet been developed, and the greater part of the rainfall must necessarily either be taken up by the vegetation, be evaporated, or slowly find its way downward through the nearly impervious subsoil, so that water stands on the surface for long periods and the type is poorly drained during much of the growing season.

Practically none of this type is used for crops. The present timber stand consists of pine, gum, and a few scrubby oaks. Grass is abundant where the trees are scattering. Poor drainage has been the chief factor in limiting the use of this type, but unfavorable location and a shallow soil have also hindered development. The type is rather difficult to till and warms up very slowly in the spring. It is low in organic matter.

The acreage in cultivation is so small that it is impossible to state yields accurately, but yields are light in comparison with the better types. This soil needs drainage and organic matter. It can be drained at a relatively low cost, as the natural drainage courses are near at hand. Organic matter may be supplied by turning under green-manure crops. Good results follow the use of lime.

OKENEE LOAM.

The Okenee loam consists of 10 to 18 inches of black fine-textured loam, underlain by a dark-gray loam of coarser texture extending to a depth of 3 feet or more. The soil when wet is sticky to mucky. The structure of the subsoil ranges from sticky to somewhat plastic. In places near the boundary with sandy types the soil is coarser than typical, and from a point northwest of Bristow to 1 mile or more south of Brownsville there occur small bodies of Okenee sandy loam. The type very closely resembles the Portsmouth loam.

The Okenee loam occurs on the Peedee River terrace, mainly between Hickson and Madeline on the Bennettsville & Cheraw Railroad and between Marlboro and the Marlboro-Dillon County line. It is also found along Gum Swamp and Crooked Creek bottoms opposite and below Bennettsville. It occupies low or depressed areas on the upland side of the terrace. Streams rise in or cross nearly all of the larger areas of the type, but its position and the excessive seepage from the adjacent uplands keep it in a semiswampy condition during the greater part of the year.

The Okenee loam is a fairly extensive terrace soil, but only a few acres are in cultivation, the remainder supporting a forest of gum, maple, cypress, pine, and other trees, with a dense undergrowth

of brush and vines. The heavy forest growth, the difficulty of adequately draining the land, and the small demand for land not well suited to cotton production have retarded its development, although when properly drained and improved it becomes a productive soil, adapted to a considerable range of crops. Near Hickson an improved area is in potatoes, and the crop seems to be doing well.

The present price of this land for agricultural purposes is low. Part of the type is valued largely for its timber.

Drainage, the first requisite in the reclamation of this type, may be accomplished by digging ditches along the present drainage ways and constructing lateral ditches to all parts of the individual areas. Fairly heavy applications of lime would prove beneficial.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Okenee loam:

Okenee 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.*
2429120	Soil	1.8	8.5	4.2	16.8	15.5	30.4	22.6
2429121	Subsoil	4.6	15.8	7.4	24.5	14.4	19.4	13.8

CONGAREE FINE SANDY LOAM.

The Congaree fine sandy loam is a brown, mellow fine sandy loam, 8 to 10 inches deep, with a subsoil of slightly lighter brown fine sandy loam, loose to compact in structure. Stratified fine sand and silt form the substratum. Both soil and subsoil contain a fairly large amount of mica.

In places the texture grades toward a very fine sandy loam. As a rule the type is usually lightest next the river and becomes finer as the distance from the river increases, finally grading into the silt loam of the series. Above the Cheraw Bridge a small area of loamy fine sand occurs. There is some variation in the character of the subsoil, especially the deep subsoil, which is in places a fine sand or very fine sand.

The Congaree fine sandy loam is developed in the broad Peedee River bottom. The largest and most continuous area lies between Gardners Bluff and the Society Hill Ferry. The surface is prevailingly flat, but broken here and there by the channels of creeks from the uplands. It lies 10 to 20 feet above the normal level of the river, and surface and internal drainage are good except for occasional overflows during periods of high water. The type is the first of the bottoms soils to emerge from the flooded area, and it drains quickly after the floods have subsided.

Only about one-half of this type is in cultivation, although practically all of it was used for crops prior to the Civil War. The decrease in the cultivated area is due partly to the fact that the levees have not been maintained. The uncultivated part of the type supports a growth of old-field pine or broom sedge. This is a productive soil and its cultivation is profitable notwithstanding the occasional loss or damage of crops by overflow. Tillage is comparatively easy.

Corn, grain, and cotton are the chief crops. Good yields are obtained in favorable seasons. Farming methods are somewhat lax, as the farmers regard profitable yields as certain if overflows do not occur during the growing season. Little or no fertilizer is used, no stable manure is applied, and crops are not rotated.

Land of this character is held in large tracts with adjoining types, and little of it has changed ownership in recent years. From $30 to $50 an acre probably represents its present sale value. This type may be improved in the same way as the silt loam of the series.

CONGAREE SILT LOAM.

The Congaree silt loam consists of 8 to 10 inches of mellow, brown silt loam underlain by a fairly friable, compact, heavy silt loam or silty clay loam, slightly lighter brown in color, extending to a depth of 3 feet or more. Both soil and subsoil usually are micaceous. In places material ranging from a pure sand to very fine sand or very fine sandy loam is encountered at or below a depth of 30 inches.

This type grades on the one hand toward the Congaree very fine sandy loam and on the other toward the silty clay loam. The rich-brown color of the surface soil is always present. In general the soil is most typical on the river side of the areas, while on the opposite side there is frequently a gradation toward a yellowish-brown to slightly mottled brown and yellow color in the lower part of the 3-foot section. In some included old stream courses, too small to map, the soil usually resembles either the Congaree or the Wehadkee silty clay loam.

The Congaree silt loam occurs in the Peedee River bottom from near the North Carolina line south to the southern limit of Welsh Neck. Its surface is level except where traversed by a few shallow old stream courses. The type lies 10 to 20 feet above the normal level of the river and is usually overflowed for short periods one or more times a season. While the surface and subsurface drainage is rather slow, artificial drainage is unnecessary in seasons of average precipitation. In places old levees give some protection from inundation. The type emerges quickly from overflows and in a moderately short period drains sufficiently to allow cultivation.

Practically all this type is used for crops. It was one of the first bottom soils to be cleared on the old river plantations, and it has

been in cultivation more or less continuously since that time. The soil carries a moderate amount of organic matter, but tillage operations must be restricted to periods when the moisture is just right, as the soil clods and bakes badly if handled when too wet. It is productive under favorable conditions, as it receives a thin deposit of river sediment nearly every year. It is well adapted to the production of general farm crops.

A noticeably smaller proportion of the type is planted to cotton than in the case of the upland and terrace soils. Corn probably leads in acreage, followed by the small grains and cotton. Overflows may occur either early or late, and may delay planting or injure or kill the growing crop. As a rule, the yields are either very good or very poor. Corn yields about 25 to 50 bushels per acre and oats 30 to 40 bushels.

Much of this type is inefficiently handled on account of distance from the farm buildings and of danger from overflows. As a rule, a heavier grade of farm machinery is used than on the sandy uplands. Corn rows are placed the same distance apart as on the uplands, but the plants are allowed to stand closer in the rows. No definite rotation of crops is practiced. A few farmers use fertilizers, but the applications are light and for the purpose of giving the crop a good start.

Land of this character is owned in large tracts and farmed usually in conjunction with upland types. Practically none of it is changing ownership.

The productive capacity of this and the associated types should warrant a considerable expenditure to prevent overflows. Much of the type was at one time more or less well protected, but the old levees have broken in many places. Cooperation among the landowners will be necessary in order economically to protect this type from overflow.

Congaree silt loam, terrace phase.—The soil of the Congaree silt loam, terrace phase, is a light-brown to brown, compact, fine-textured loam to silt loam, about 6 inches deep. The subsoil is a brownish-red clay loam to silty clay loam extending to a depth of 3 feet or more. The subsoil has a hard and stiff though rather brittle structure.

This phase occurs in the Peedee River bottom, occupying rises only slightly above the low river swamp. It has fairly good natural drainage, except during periods of rather high overflow, when it is covered with water to a depth of a few feet. As a rule it is inundated annually for short periods.

This soil was one of the first to be put in cultivation, and all of the areas mapped have been in cultivation at some time. At present only a small proportion of it is used for crops, the remainder being cov-

ered with the forest growth typical of old fields. The levees constructed in early days are no longer maintained. The soil is inherently productive. Cotton, corn, and grain are grown in small fields, and under favorable conditions good yields are obtained. The land needs protection from overflow in order to be farmed successfully. The construction of roads would enhance its value.

CONGAREE SILTY CLAY LOAM.

The surface soil of the Congaree silty clay loam consists of 8 to 12 inches of fine, mellow silty clay loam of a rich-brown color when moist and light-brown when dry. The subsoil to 3 feet or more is a brown, compact silty clay loam showing a few specks of rusty brown or gray. In the lower swamp the subsoil in many places is a brownish-yellow silty clay loam. Again there are areas with a brown surface soil and a mottled gray to rusty-brown subsoil, the latter being quite similar to the subsoil of the near-by Wehadkee silty clay loam.

The Congaree silty clay loam is confined to the first bottom of the Peedee River. It begins as a narrow strip near the northern end of the county and widens out into large and almost continuous areas following the river. The surface is generally level, with a few old sloughs or depressions running parallel to the river, especially in the larger bends. All of the type is subject to heavy inundations and occasionally the overflows attain a depth of 10 feet or more.

Very little of this soil has been drained and reclaimed, and only patches of it are now under cultivation. It supports a magnificent growth of ash, gum, elm, some oak and hickory, and an undergrowth of cane. It is primarily an open-forested swamp, being dry the greater part of the year. The soil is the richest in the county and would produce very large yields, particularly of corn, if it were not overflowed so frequently. If it were cleared and seeded to grass, especially Bermuda grass, excellent pasture for cattle would be obtained. The soil is so productive that no fertilizer would be necessary for the production of crops. In some places in the Carolinas it is extensively used for the growing of corn and pasturage crops.

WEHADKEE SILTY CLAY LOAM.

The soil of the Wehadkee silty clay loam is a brownish-gray to gray silty clay loam, about 10 inches deep. The subsoil is a light-gray silty clay to clay, mottled with yellowish brown, to a depth of 3 feet or more. The soil and upper subsoil, especially when wet, are sticky. The lower subsoil is compact and rather tough when moist, but assumes a fairly friable structure when drying out.

There are a number of variations within the type as mapped, as it covers an inaccessible section of the river bottom. In places the

material closely approaches the color and structure of the upland Dunbar series, except that the soil has a brownish color from recent deposition of sediment. Such areas consist of brownish silty clay loam underlain by compact, yellow silty clay loam to silty clay, which below a depth of 24 inches changes to a compact and hard silty clay of mottled yellow, red, and gray color. Again, the material may closely resemble that of the Leaf series in color and structure of subsoil, except that the upper subsoil is very sticky when wet. Material belonging to the Thompson series is also included. The boundary between the Congaree soils and this type is fairly definite in the accessible parts of the bottom. In other places the boundary as drawn is more or less generalized.

The Wehadkee silty clay loam is confined to the terrace side of the wide Peedee River bottom. An area several square miles in extent, starts at the road from Society Hill to Bennettsville and continues southeast to the Atlantic Coast Line Railroad. A still larger one occurs about 1 mile south of Hunts Bluff, extending in a southerly direction to a point about 3 miles southwest of Brownsville. A third area lies almost immediately west of the north end of this one. A narrow strip borders the terrace for some distance about 1½ miles southwest of Everett.

The surface of this type is characteristically flat, with an imperceptible slope in the direction of the stream flow. Locally there are old slough channels and other slightly depressed areas. The type lies 10 to 15 feet above the normal level of the river, or at practically the same elevation as the Congaree silty clay loam. It is very poorly drained, and in places water stands on the surface for long periods. Although it is subject to fairly deep overflow one or more times a year very little sediment is being deposited at the present time.

This is the second most extensive type in the river bottom, being exceeded only by the Congaree silty clay loam. Practically all of it supports a virgin timber growth, consisting mainly of water and willow oak, sweet and black gum, holly, ash, ironwood, and a number of other trees. A few small tracts have been logged off, but none of the land has been cultivated.

The value of this type depends upon that of its timber. It is owned in large tracts.

The prevention of overflow is essential to the successful farming of this type. The reclamation of large tracts by the cooperation of the owners in the construction of levees and drainage ditches is the only practicable way to cope with the problem. When reclaimed, the type will produce good yields of corn and grain and make excellent pasture land.

THOMPSON LOAM.

The Thompson loam consists of grayish to yellowish-brown loam to silty loam about 10 inches deep, underlain by a silty clay loam of a yellow color or of a basic yellow, mottled with gray and some red. The soil has a fairly friable structure, but the subsoil is hard and compact, although moderately friable when dry. The brownish color of the soil is due to accessions of sediment from recent overflows. The type lies south of the two largest creeks crossing the Peedee River bottom and its component materials are doubtless deposited in part by the river and in part by the tributary streams. In places the soil is slightly sandy and lighter in color than typical.

The Thompson loam is confined to several areas, mainly near the upland side of the Peedee River bottom, ranging from a few to several hundred acres in extent. The largest area lies about 1 mile southwest of Mathesons Mill on the road from Society Hill to Bennettsville. Another one of considerable size is approximately 3½ miles southwest of Drake. A small area occurs along Marks Creek in the northwestern corner of the county.

The surface of the type is level. In places it is traversed by narrow depressions or old sloughs in which occur strips of other soils too narrow to map. The type is rather imperfectly drained, and is subject to overflow.

None of this land is in cultivation. It supports a growth of pine, oak, sycamore, maple, and a number of other trees. Its sale value is based mainly on the forest growth, varying with the stand of merchantable trees. There is no demand for the land for agriculture.

The construction of levees to protect this land from overflow should precede its use for crops. The type when properly reclaimed should be a strong soil adapted to the production of corn and other grains and grasses.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Thompson loam:

Mechanical analyses of Thompson 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.*
2429136	Soil	1.5	5.8	2.0	17.0	22.4	31.4	19.7
2429137	Subsoil	.8	3.6	1.4	16.0	19.3	30.2	28.3

JOHNSTON LOAM.

The areas mapped as Johnston loam represent swampy to semi-swampy material in the first bottoms along all the well-defined streams of the county except the Peedee River. In general the material is a dark-gray to nearly black sandy loam to loam or silty loam

extending with very little variation to a depth of 3 feet or more or underlain at depths ranging from 15 to 20 inches by a gray sandy loam to clay loam which continues to 3 feet or more. As a rule the texture of the material varies with the character of the surrounding soils and the location in the individual bottoms. A more or less sandy texture prevails along the streams in the Sandhill section, while the texture is finer in the comparatively wide bottoms and especially along streams in the Flatwoods section. In places the material is decidedly mucky.

The Johnston loam occurs in low-lying strips, ranging from a few hundred feet to one-half mile or more in width, along practically all the creeks and branches of the county. The largest areas occur along Crooked, Naked, Whites, Phils, Beaverdam, and Three Creeks, Gum Swamp, and Little Peedee River. The surface is flat, with a slope in the direction of the stream flow. The stream bottoms range from 5 to 50 feet below the general level of the surrounding country. In some places the drainage water spreads over the bottoms, and in others it follows fairly well defined but meandering channels. Drainage is very poorly established, owing in part to seepage from the adjoining uplands. The type is subject to rather frequent overflow.

None of this land has been reclaimed for farming. It supports a fairly dense growth of mixed pine, gum, oak, maple, cypress, and tupelo, with an undergrowth of vines and shrubs.

This land is valued along with the adjoining types. In its present state its real value is based upon the stand of timber.

Artificial drainage is the first essential in the improvement of this type. This may be accomplished by straightening the stream channels. In addition, the construction of a few lateral ditches will be necessary in the wide bottoms, and in places ditches will be necessary to remove the seepage from the uplands. It is probable that the gradient is sufficient for the streams thus straightened to deepen their channels and keep them so open that the liability of overflow will be greatly lessened. This soil, when reclaimed, will produce good yields of hay and other forage crops, and thus greatly assist in balancing farming operations.

MUCK.

Muck consists of a friable, smooth, finely divided, and quite thoroughly decomposed mass of organic matter, with an admixture of mineral matter consisting of silt, clay, and some fine sand. As mapped in this county it carries little or no fibrous material.

Four areas of Muck are mapped in Marlboro County. In Catfish Bay mucky material extends to a depth of 3 feet or more, and the subsoil apparently carries very little more mineral matter than the soil. None of this area is cleared and some of it supports the original timber growth. North of the Little Peedee River near the

Dillon County line another small area of similar character is mapped. Part of this has been cleared and cultivated. The Muck in Hilson and Mossy Bays may be best described as a shallow phase, as the mucky layer ranges in depth from 12 to 18 inches in the old clearings, although it is probably deeper near the center of the bays and their uncleared sections. The subsoil is very plastic, gray to mottled gray and yellow clay loam to clay, continuing to a depth of 3 feet or more.

Muck occupies a depressed position with respect to the surrounding soil types. The surface is flat. Small streams either head in the several areas or ditches, have been dug in order partially to drain them. A large acreage in the upper end of Hilson Bay has been improved with ditches so that the material does not remain swampy throughout the year. Over the remainder of the Muck a swampy to semiswampy condition prevails, water standing on the surface for long periods and the material being saturated during the greater part of the year.

Part of Catfish Bay supports its original growth of scattered pine, with a fairly dense undergrowth of cane, vines, etc. The remainder has been recently logged off. In Hilson Bay the present timber is scattering cypress, gum, maple, and pine, typical of cut-over land. The part formerly cultivated supports a growth of wild grasses and weeds. Mossy Bay comprises mainly cut-over land on which there is a scattered growth of forest trees, vines, and underbrush.

At present Muck is not used for crop production. Approximately 1,000 acres in Hilson Bay were once in cultivation, but have been abandoned for years and are now used for pasture. The land is held at a low price.

The reclamation of Muck by artificial drainage is in most cases practicable, as natural streams head in or near the areas. When this land is reclaimed it is adapted to the production of corn, cabbage, and other crops.

SUMMARY.

Marlboro County is located in the northeastern part of South Carolina, adjoining the North Carolina line. Its length and width are approximately 33 and 20 miles, respectively. It has an area of 519 square miles, or 332,160 acres.

This county occupies part of a belt extending from the crest of the Sandhill region into the lower Coastal Plain. It lies 140 to 300 feet or more above sea level, the highest elevations being in the northern part. The surface varies from level to undulating and hilly. All of the county drains into the Peedee River system. Drainage is well established in the undulating and hilly sections, but poorly established in much of the level country.

The settlement of Marlboro County dates from 1736 and its organization from 1785. Welsh, English, French Huguenots, and

Scotch were among the early settlers, and the present white population consists largely of their descendants. The Marlboro Plain is the most thickly settled section and the river flood plains the most sparsely settled. The population in 1910 was 28,543, over nine-tenths of which was rural. Bennettsville is the largest town and county seat. McColl and Clio are other towns of importance.

The county has good railroad facilities, and a fairly extensive system of public roads. Rural mail delivery routes reach practically all parts.

The climate is characterized by short mild winters and long hot summers. The mean annual precipitation is 46.98 inches, nearly two-thirds of which falls during the summer months. There is a range in temperature from an absolute maximum of 104° F. to an absolute minimum of —9°. The mean annual temperature is 61.5°. The average length of the growing season is 216 days. Climatic conditions are adapted to the production of a wide variety of farm crops.

Agriculture has always been an important industry and has become the leading one since the decline of lumbering and turpentining. In 1910, 69.3 per cent of the county was in farms, averaging 62.3 acres each, of which an average of 34.6 acres was improved land.

In 1909 cotton was grown on 66.6 per cent of the total cultivated area and its value was 84.6 per cent of the total value of all crops. Both long and short staple varieties are grown. Corn is widely but not extensively grown. Wheat, oats, and rye comprise the other cereals grown. Cowpeas, sweet potatoes, Irish potatoes, forage crops, sorghum, cantaloupes, and vegetables are minor crops. Less than 5 per cent of all farm income in 1909 was from the sale of live stock and animal products.

Marlboro County is considered one of the best developed and most extensively farmed counties in the South. There are a large number of different soil types in the county, but the most important and best developed lands are included in the Norfolk, Marlboro, Ruston, Orangeburg, Greenville, and Dunbar series. These soils are well drained and are used principally for the production of cotton. Corn and cowpeas are successfully grown, and a few fields are devoted to wheat and oats. Peanuts would do well not only upon these soils, but also on the sandy soils of the river terrace.

The best drained second-bottom or Peedee River terrace soils are the Amite and Kalmia. These are devoted to the same crops as the upland types. The first-bottom lands are little used for agriculture at present. The Congaree soils are naturally productive and when reclaimed from overflows give large yields of corn without fertilization. They are fine grass soils and natural pastures for cattle are available in many parts of North Carolina on such lands. They offer an excellent opportunity for the cattle industry.

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[PUBLIC RESOLUTION.—No. 9.]

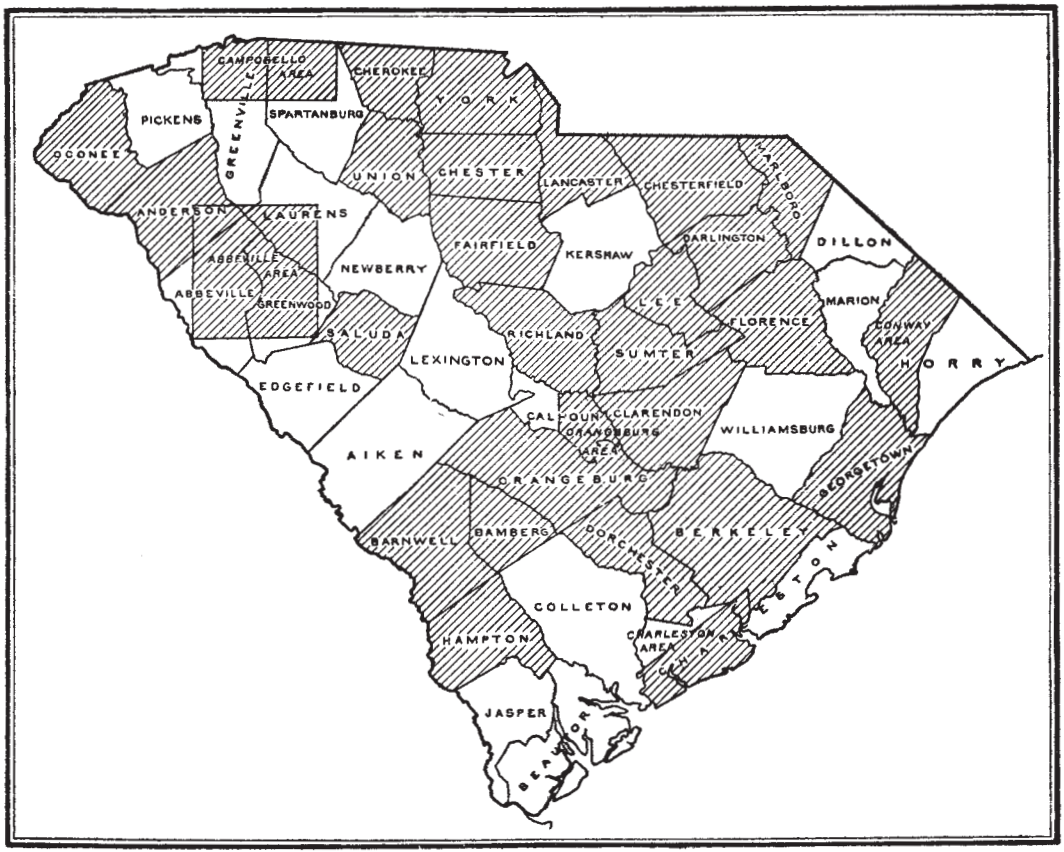
JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

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.]



Areas surveyed in South Carolina.

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