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Soil Survey of Williamsburg County South Carolina

By
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and C. S. SIMMONS

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with the South Carolina Agricultural Experiment Station

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By W. J. LATIMER, in Charge, B. H. HENDRICKSON, F. R. LESH, A. H. HASTY, W. E. THARP, and C. S. SIMMONS

COUNTY SURVEYED

Williamsburg County is in the eastern part of South Carolina. (Fig. 1.) Kingstree, the county seat, is 60 miles north of Charleston, 36 miles south of Florence, and 48 miles from the Atlantic Ocean. The southern boundary is formed by Santee River, and Peedee River touches the northeast corner. The county is roughly rectangular in shape and includes an area of 981 square miles, or 627,840 acres.[1]

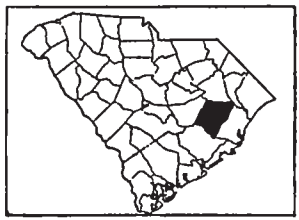


FIGURE 1.—Sketch map showing location of Williamsburg County, S. C.

The county lies in the "flatwoods" region of the Atlantic coastal plain, and has the typical physiographic features of this region. The land surface is level or undulating and is broken by numerous streams which have formed low swamp developments. The outstanding features of the upland are the undulating well-drained areas which flank the bluffs surrounding the swamps. They merge into the wider flats or extensive plains which for the most part are level, being broken only by slight elevations and many larger bays, in which the small streams head. These bays form one of the pronounced surface features. Another noticeable physiographic feature is a well-defined sand ridge, standing from 10 to 15 feet above the general land level, which extends from near Kingstree in a northeast direction to Lake Swamp, and south of Black River for a short distance. The escarpment of the western ridge is well defined and marks a line of bays which are held or formed by this barrier. On the south the ridge slopes gently to a lower level. Locally the more prominent parts of the ridge are called the "sand hills." The large swamps of Santee River, which lie along the southwestern edge of the county, range from 1 to 4 miles in width. The bluffs along the Santee swamp are higher and have more relief than those along other streams. The swamps of Black River, which average 2 miles in width, pass through the south-central part of the county. Black Mingo Creek heads in the county and reaches a width of 1 mile before it leaves. The Lake Swamp-Lynches River-Peedee River Swamp, ranging from one-half to 2 miles in width, lies along the northeastern boundary.

The general slope of the land is to the southeast, with a drop of about 1 foot to the mile. An elevation of about 76 feet above sea

[1] The soil map for Williamsburg County includes 44 square miles of Florence County which was annexed to that county since it was surveyed.

level [2] is reached on the northwestern boundary line. The main streams reach tide level near the southeastern edge of the county.

Considered as to drainage, the land of the county may be grouped into three classes, as follows: (1) Undulating well-drained land along the swamp edges and ridges throughout the interior plains, comprising about 25 per cent of the land area; (2) imperfectly drained land of the interior plain, comprising about 35 per cent, where the relief is not sufficient for drainage water to run off rapidly; and (3) the poorly drained swamps along the streams and bays in the interior, which occupy fully 40 per cent.

The southwestern part of the county is drained by short lateral streams into Santee River; the south-central, central, and northwestern parts are drained by numerous tributaries into Black River; the north-central part is drained by Black Mingo Creek, and the northeastern part is drained through Lake Swamp, Lynches River, and Peedee River. Most of the large bays in the interior of the upland drain in two directions. Some of the largest of these are The Morass, and Dobson, Smiths, Sand, Alligator, Butlers, Rutledge, and Findley Bays.

Santee River has cut a much deeper valley than the other streams. Here the bluffs are from 30 to 45 feet above the water level of the swamps. The bluffs along Black River and other large streams range from 20 to 30 feet, and along the smaller swamps the rise is from 5 to 10 feet, ranging down to only a few feet near their heads. Other areas merge imperceptibly into the bays and flats from which the streams rise. A number of sink holes occur in the southeastern part of the county, some of which are drained by underground streams, and others form dry craterlike depressions.

The larger streams, although sinuous, have rather rapid currents. Black River flows at an elevation of about 50 feet above sea level where it enters the county on the northwest and reaches tide level where it leaves on the southeast, giving a gradient of 1⅓ feet to the mile. The smaller streams have rather swift currents where they break from the upland to the main river swamps, but elsewhere the currents are sluggish, and the streams have a tendency to spread out over the swamp instead of following a well-defined channel. Such streams are commonly spoken of as swamps. The larger streams with well-defined channels are designated as creeks and the smaller ones as branches or runs.

A number of drainage districts are in operation; one in the northern part of the county drains about 30,000 acres and seems to be giving satisfaction.

The first settlement in Williamsburg County was made at Willtown Landing on Black Mingo Creek in 1725, and in 1732 a party of Scotch settled in Kingstree. Soon afterwards the French Huguenots began to settle along the Santee River bluffs. The present population is descended largely from the original settlers and from the slaves. Some people have come in from adjoining counties. The county was organized in 1785.

The population in 1920 was 38,539, all classed as rural. The density was 41.6 persons to the square mile. Kingstree, the county

[2] UNITED STATES GEOLOGICAL SURVEY. SOUTH CAROLINA, MANNING QUADRANGLE. Topographic map. 1921.

seat, with a population of 2,074 in 1920, is the largest and most important town. It is a tobacco, cotton, and truck market. Greelyville, Lane, and Hemingway are small but commercially important towns.

Lake City, which is just north of the county, is an important market for tobacco and other crops in that section; Andrews, in Georgetown County, is a shipping point and market for the southern part; and Johnsonville is used for trading by residents of the northeastern part.

The county is well supplied with transportation facilities. The main line of the Atlantic Coast Line Railroad passes north and south through the county, with a branch line extending northwest from Lane. The Seaboard Air Line Railway extends through the eastern part of the county, with a branch from Andrews to Lane.

The county roads are, for the most part, good and are being rapidly improved. United States Highway No. 17 passes north and south through the county. Several well-constructed State roads reach the important towns and trading centers. The secondary roads are fair in dry seasons but poor in wet seasons.

CLIMATE

The climate of Williamsburg County is oceanic. It is marked by comparatively short mild winters, long hot summers, and heavy rainfall well distributed throughout the year. Freezing temperatures are common during the winter, but the cold spells are of short duration. Snow is rare, and zero weather has never been recorded. In summer, the thermometer frequently reaches 100° F., and high temperatures have been known to continue for several weeks, but fresh breezes have a tendency to break up the muggy condition of the atmosphere and moderate the heat to a great extent. The precipitation averages 46.44 inches annually. Of this amount more than one-third falls during the summer when it is needed by the growing crops, and even in the driest year on record the summer rainfall was almost normal. The rainfall for the remainder of the year is about equally distributed among the three seasons. Torrential thundershowers are frequent in summer.

The prevailing climatic conditions over a long period of time have had a marked effect on the soils. The heavy rainfall has leached most of the soluble minerals from the soil and carried down the fine insoluble materials to the subsoil. This process has been very active on the strongly rolling soils and less active on the interior plains. Since the land was put under cultivation erosion has been active on the steeper slopes. The strong sunshine has a tendency to dissipate the organic matter, especially in well-drained aerated lands and cultivated fields. On the flats and in poorly drained areas and swamps, the accumulation of organic matter has been facilitated by the high water table.

The average date of the last killing frost is March 15, but killing frost has occurred as late as April 18. The average date of the first killing frost is November 14, and the earliest recorded was on October 9. The average growing season is eight months, which is ample for the production of a great variety of crops, and many farmers obtain two crops from the same ground in one season. The climatic condi-

tions are favorable for the production of general farm crops, tobacco, and truck crops, and for livestock raising.

The mild winters make possible the production of some hardy winter crops and a variety of spring crops for the northern markets.

Table 1 gives the monthly, seasonal, and annual temperature and precipitation as recorded by the Weather Bureau station at Kingstree.

TABLE 1.—*Normal monthly, seasonal, and annual temperature and precipitation at Kingstree, S. C.*

[Elevation, 54 feet]

Month	Temperature			Precipitation			
	Mean	Absolute maximum	Absolute minimum	Mean	Total amount for the driest year (1911)	Total amount for the wettest year (1916)	Snow, average depth
	°F.	°F.	°F.	*Inches*	*Inches*	*Inches*	*Inches*
December	47.3	85	8	3.05	2.21	2.24	0.3
January	47.7	80	9	3.06	1.02	1.16	.6
February	47.5	85	6	3.95	.75	2.77	1.4
Winter	47.5	85	6	10.06	3.98	6.17	2.3
March	56.6	95	22	3.40	1.55	1.72	(1)
April	63.2	95	28	2.81	1.03	1.63	0
May	71.8	100	39	3.19	.78	1.92	0
Spring	63.9	100	22	9.40	4.26	5.27	(1)
June	78.0	105	44	5.16	2.88	4.57	0
July	80.6	103	51	6.52	4.11	31.13	0
August	79.5	101	43	6.30	8.60	3.56	0
Summer	79.4	105	43	17.98	15.59	39.26	0
September	74.3	100	34	4.10	2.78	5.73	0
October	64.5	96	25	2.85	3.69	4.55	0
November	54.7	88	15	2.05	3.56	1.20	(1)
Fall	64.5	100	15	9.00	10.03	11.48	(1)
Year	63.8	105	6	46.44	33.86	62.18	2.3

[1] Trace.

AGRICULTURE

Williamsburg County was settled a little later than the country along the coast. The settlers did not attempt agriculture on a European basis but produced subsistence crops found to be suited to the region, such as corn and sweetpotatoes. Many of the settlers who came from south of the Santee River were rice planters. Numbers of Scotch settlers were flax growers and weavers. Indigo and tobacco were grown at an early stage in the agricultural development, and cotton was introduced 30 or 40 years after settlement but did not become important until after 1800. As rice culture became unprofitable following the Civil War, it was gradually abandoned and cotton became the chief money crop.

Other crops were not subordinated to cotton in this county to the same extent as in most parts of the State. Subsistence crops have always held an important place. Cattle and hogs have been kept in gradually increasing numbers since the early settlement.

By 1879, according to the United States census report, cotton was grown on 15,898 acres, corn on 30,291 acres, oats on 1,070 acres, rice on 3,428 acres, and sweetpotatoes on 1,173 acres.

In 1919, the census figures credit the county with 54,324 acres of corn, 1,998 acres of oats, 2,006 acres of dry peas, 12,858 acres of hay and forage, 19,355 acres of tobacco, 49,631 acres of cotton, and less than 1,000 acres in the following subsistence crops combined, wheat, rye, rice, potatoes, and other vegetables.

Table 2, compiled from United States census reports, gives the acreage of the leading crops and shows the general trend of agriculture in Williamsburg County from 1879 to 1924.

TABLE 2.—*Acreage of principal crops in Williamsburg County, S. C., in stated years*

Crop	1879	1889	1899	1909	1919	1924
	Acres	*Acres*	*Acres*	*Acres*	*Acres*	*Acres*
Cotton	15,898	33,951	41,067	65,594	49,631	34,987
Tobacco	----------	(1)	1,217	3,899	19,355	11,154
Corn	30,291	37,134	48,919	48,054	54,324	46,709
Oats	1,070	2,527	2,892	6,480	1,998	[2] 303
Hay and forage	38	342	2,650	5,962	12,858	[3] 13,673
Sweetpotatoes	1,773	1,436	1,823	2,047	522	1,279
Rice	3,428	1,247	2,206	117	15	46
Potatoes	----------	6	56	54	28	76

[1] Less than 1 acre. [2] Threshed for grain. [3] Hay only.

These figures indicate a stable agriculture and steadily increasing production, notwithstanding the loss of a large area from the county, during each decade, by annexation to adjoining counties.

The year 1919 may be taken as marking the high tide of the agricultural development which began with the close of the Civil War. The depression of 1920 and the advent of the cotton-boll weevil in 1922 brought about serious farm conditions. During the first few years of weevil infestation many farms were abandoned and crop production was curtailed. However, conditions are again becoming more nearly normal as indicated by the report of the State statistician for 1925, which gives the following acreages: Cotton, 36,000; tobacco, 15,000; corn, 50,769; oats, 7,260; sweetpotatoes, 2,463; cowpeas, 5,845; and potatoes, 507. A number of new crops, early potatoes, beans, and peas, appear as truck grown for the northern markets.

The trend toward a diversification of crops has continued as cotton production has proved unprofitable. This year (1928) there is a further decrease in cotton acreage and an increase in that of tobacco. It is estimated that from 500 to 600 acres are in early potatoes, from 1,000 to 1,200 acres in beans, 325 acres in peas, and several hundred acres in broccoli.

Owing to the uncertainty of the cotton crop, tobacco has become the main cash crop, supplemented by early truck crops and sweetpotatoes. Subsistence crops grown on a large scale are corn, oats, cowpeas, and hay. Soybeans, velvetbeans, sugarcane, wheat, rye, sweetpotatoes, and potatoes are minor subsistence crops. Peanuts and watermelons are grown in a small way for market. More attention is being paid to livestock, especially hogs, and poultry.

Cattle and hogs are kept in nearly all parts of the county, and in the Cedar Swamp section a number of sheep are kept. Tobacco is grown generally but is produced on the largest scale in the northern part. Beans and peas are grown around Kingstree, Lane, Gourdin, and Hemingway; broccoli chiefly in areas continguous to West Andrews and Cades; and squash and cucumbers between Kingstree and Cades.

Fruit trees, consisting of summer apples, peaches, pears, and plums, are found on nearly every farm. According to the census, there were, in 1919, 727 bearing apple trees, 1,559 peach trees, 197 pear trees, 1,373 plum trees, 20 cherry trees, 104 fig trees, 249 pecan trees, and 417 grapevines.

Farm products, such as truck crops, hogs, poultry, and eggs, are shipped to Richmond, Washington, Baltimore, and other northern points. Quantities of the beans, peas, and potatoes go to the coal-mining regions of West Virginia. Tobacco is sold on local markets, thence shipped to factories and used mainly for making cigarettes. Cotton is sold on local markets and goes chiefly to foreign markets through the port of Charleston.

A very small proportion of the farm produce is utilized locally, aside from subsistence crops used on the farm. Cattle for fattening are sold to farmers of the higher coastal plain and piedmont areas.

Table 3 gives the total value of agricultural products produced on the farms in 1919.

TABLE 3.—*Value of agricultural products by classes in Williamsburg County, S. C., in 1919*

Crop	Value	Livestock and products	Value
Cereals	$2,035,529	Domestic animals	$2,366,722
Other grains and seed	30,137	Dairy products, excluding home use	38,657
Hay and forage	288,410	Poultry and eggs	125,686
Vegetables	283,030	Wool	943
Fruits and nuts	11,112		
All other crops (including cotton and tobacco)	9,880,949	Total	2,532,008
		Total agricultural products	15,061,175
Total	12,529,167		

The surface relief of the soils has a strong influence on the drainage and therefore on the soils and their utilization. The poorly drained swamps and bays are not cultivated, but in many places they provide a poor grade of pasturage. The extensive imperfectly drained flats are rarely used for cultivated crops but are usually burned over each spring and used as pasture. They are mostly covered by forest. Most of the terraces along the streams are subject to occasional overflow, and only the higher parts can be used safely for crops.

The well-drained upland soils are the only ones used for crops to any extent. There is a noticeable correlation between certain soils and abandoned fields, more abandoned fields being found on the Blanton and lighter Norfolk soils than elsewhere. Probably less of the Lenoir soils has been brought under cultivation than of any other well-drained upland soil. The Dunbar soils, hitherto used to a comparatively small extent, are now being cleared and used. The

Norfolk soils are used extensively for tobacco, although that crop is grown on all the upland soils as well as on soils of the Coxville series.

The farmers in general realize that the lighter Norfolk soils are excellent for a sensitive crop like tobacco, whereas the heavier Norfolk soils and the Ruston, Cuthbert, Marlboro, and Dunbar soils are considered strong soils and better suited to general farm crops and cotton, but these considerations are not always followed in practice. Practically every crop grown in this region was found growing on every upland soil. The best potato soil has not been determined by the farmers.

Clean cultivation is the general practice in this county. On most farms cotton and corn stalks are removed and the grass burned before the land is broken. Cover crops are rarely used. The farmers depend on the small amount of manure produced and more generally on commercial fertilizers to keep up soil fertility. Most farmers plant peas at the last working of corn, but legumes are not in general use as a soil builder.

No definite system of crop rotation is followed. It is common practice to plant corn, cotton, or tobacco on the same land an indefinite number of seasons. A form of rotation is followed by some farmers in varying the crops, oats as a rule being followed by peas, and truck crops being followed by a staple crop in order to get the benefit of the fertilizer not used by the truck crop.

In 1919, 93.3 per cent of the farms reported the use of commercial fertilizers, with an expenditure of $316.14 to each farm. No figures are available on the present use, but it is doubtful if this sum is exceeded, although the tonnage may be slightly increased. The fertilizers in use consist of commercial brands varying from high-grade 3–8–5 for tobacco, 5–7–5 for truck, and 4–8–4 for cotton to such fertilizers as 3–10–3 and 1½–8–1. Considerable amounts of nitrate of soda, smaller amounts of sulphate of ammonia, and some phosphate, kainit, and cottonseed meal are used. The amounts of fertilizer applied to crops vary considerably and often depend on the purchasing power of the individual grower. For tobacco and truck crops the amounts are more uniform. Cotton receives from 200 to 800 pounds of 3–8–3 or 1½–8–1 to the acre; corn from 200 to 600 pounds of 3–10–3 or 1½–8–1, in addition to 75 to 150 pounds of nitrate of soda; tobacco, from 600 to 1,000 pounds of 3–8–5 or 3–8–3, about 75 per cent of the growers using the 3–8–5 grade; truck crops, from 600 to 1,200 pounds of 5–7–5 or 3–8–3, in addition to 150 to 300 pounds of nitrate of soda as a top-dressing. Oats receive from 75 to 300 pounds of nitrate of soda, but only about one-third of the farmers use any on oats. Liming is not generally practiced, but a number of farmers report the use of one-half or 1 ton to the acre at various times. One-half ton or smaller amounts are used by some tobacco growers annually. The small quantity of manure available is placed on garden plots and special patches of cotton and corn.

The main farm buildings are fairly good on most farms, and the outbuildings are adequate for the type of agriculture followed. Most of the tenant houses are small. Practically all the farms are equipped with tobacco barns for curing the crop, and the barns

for housing the work animals are adequate under the mild climatic conditions, but few farmers have room for storage of surplus crops. Corncribs and cotton houses are on nearly all farms.

The machinery on the better farms consists of 2-horse wagons, mowing machines, tobacco setters, 2-horse turnplows, disk and spike-tooth harrows, grain drills, hand spraying machines, fertilizer distributors, corn and cotton planters, and an assortment of plows and hand tools. Some of the more prosperous farmers have tractors. disk plows, reapers, binders, hayrakes, sulky cultivators, spraying machines, and potato graders. The equipment of the poorer farmers and tenants consists of 1-horse wagons, 1-horse plows, cotton and corn planters, fertilizer distributors, cradle scythes, and an assortment of plows and hand tools. The average value of all farm property for each farm according to the 1920 census was $3,820, distributed as follows: Land, 65 per cent; buildings, 19 per cent; implements, 5.3 per cent; and domestic animals, 10.7 per cent.

Mules are the common work animals on the farms. The 1920 census reports 6,202 mules and 2,536 horses, but a marked decrease since that time is shown by the 1925 State census estimate, which places the number of mules at 4,970 and of horses at 1,503. Most of the cattle are of grade stock, although there are some improved herds. In 1920 there were 4,903 beef cattle and 6,927 dairy cattle. the latter consisting mostly of grade Jerseys. A large number of swine is kept. The 1920 census gives the number as 23,737, and the present estimate, obtained from the county agent and others, shows a slight increase over this figure. Hogs of the Poland China and Duroc-Jersey breeds are the most numerous. The number of sheep is estimated to be about 1,000, mainly of Shropshire grades. A few goats are kept. The 1925 State estimate placed the number of chickens at 100,000. These are mainly Rhode Island Reds, Plymouth Rocks, and Leghorns, and a large percentage is purebred. Shipments of poultry and eggs have increased decidedly in the last few years.

Most of the labor is performed by the farmer and his family. Additional help is hired as needed and is used chiefly in setting tobacco, chopping cotton, and harvesting crops, particularly cotton, tobacco, and truck. In 1919 only 32.2 per cent of the farmers reported the hire of labor, with a total expenditure of $610,124. In certain sections, notably in the northern part of the county, most of the farm labor is white and fairly efficient, and in other parts negroes are depended on. Farm labor is more plentiful in the southern and eastern parts. Farm wages range from $1 to $1.50 a day, or from $20 to $25 a month when a house is furnished. Lumbering operations and sawmills pay slightly higher wages and some of the best laborers are attracted by the higher prices.

According to the 1920 census, there were 5,964 farms, occupying 57.4 per cent of the total acreage of the county. The average size of the farms was 57.1 acres, and 44.5 per cent of the farm land was improved. The average size of the tenant-operated farms is about 20 acres, and of the owner-operated farms is about 60 acres. Many farms in the county range in size from 100 to several hundred acres. The estimates for the 1925 census show a decrease in the number of farms and a decided decrease in the acreage in farms.

The 1920 census reported 60.5 per cent of the farms operated by tenants. The 1925 census estimate showed a slight increase, but it is doubtful if at present (1928) there are as many tenants, and it is certain that they operate on a smaller acreage. Of the farms operated by tenants in 1925, 757 were operated by white and 2,650 by negro tenants.

In 1920 the census reported 1,396 farms rented for cash, 12 farms for share cash, and 1,292 farms were operated by share tenants. Terms of tenure at present vary considerably. Land rental ranges from $1 to $7 an acre. Fairly good land rents for $5, ordinary land for $3, and pasture land for $1. On the share basis the owner receives one-half of the crop when he furnishes land, tools, work animals, seed, and one-half the fertilizer, and has general supervision. He receives one-fourth of the crop when land only is furnished, but very little land is rented on this basis. The common custom is for the owner to advance the money for fertilizer and for the tenant's living expenses.

The average value of farm land as reported by the 1920 census was $43.52 an acre. Although no exact figures are available, this value is known to have decreased to a very marked extent. The average value of land and buildings in 1920 was $3,208 a farm. Estmates for 1925[3] place the value of land and buildings at $1,961 a farm.

The price of the good, well-drained lands of the county depends on character of soil, improvements, transportation facilities, good roads, and proximity to towns. Some of the best-improved lands of the Norfolk, Marlboro, Ruston, and Cuthbert sandy loams and fine sandy loams range in price from $20 to $60 an acre. Some of the best-drained farming lands of the Coxville and Portsmouth soils command from $5 to $20 an acre. Extensive areas of flat poorly drained lands included in the Coxville, Portsmouth, Plummer, St. Lucie, Leaf, and Kalmia sand soils, where very little merchantable timber remains, bring from $2 to $5 an acre.

Norfolk sandy loam, Norfolk fine sandy loam, Ruston sandy loam, Ruston fine sandy loam, and the Marlboro soils constitute the most valuable farming lands in the area. The Dunbar, Scranton, and Lenoir soils rank next in value, and the lighter soils of the Norfolk, Ruston, and Blanton series rank third.

The value of the Coxville soils is largely potential, but where drained these soils are valuable for corn and truck crops. At present they are used for pasture and timber. The Portsmouth soils require a great expenditure for drainage before they can be used for crops. At present they are valuable for hardwood, gum, and cypress timber. The Plummer soils are of little value even when drained, but they support a good growth of pine and, in places, cypress and gum. The terrace soils, owing to their small extent, are of little value. The vast areas of swamps consisting of Johnston loam are poorly drained and present an engineering problem before they can be reclaimed. They support hardwood, cypress, and gum timber. The large swamp along Santee River is subject to deep and long inundations and has little value except for timber.

[3] Estimates for land values obtained from the county clerk's office.

SOIL SERIES AND TYPES

In soil classification all soils are classed in soil series on the basis of the characteristics of the soil profile, chiefly the color, structure, consistence, compaction, and thickness of the layers or horizons which compose it. The series are further divided into soil types, differentiated on the basis of texture, that is, the proportion of different-sized soil particles, such as sand, silt, and clay, in the respective soils.

In this survey 36 soil types and 3 phases of types, representing 17 soil series, are mapped. In the following pages of the report the various soils are described in detail and their agricultural importance is discussed. Their distribution is shown on the accompanying map, and their acreage and proportionate extent are given in Table 4.

TABLE 4.—*Acreage and proportionate extent of soils mapped in Williamsburg County, S. C.*

Type of soil	Acres	Per cent	Type of soil	Acres	Per cent
Norfolk fine sandy loam	65,408	10.7	Lenoir sandy loam	2,176	0.3
Deep phase	1,984		Coxville fine sandy loam	101,568	16.2
Norfolk sandy loam	19,328	3.2	Coxville sandy loam	8,640	1.4
Deep phase	320		Coxville very fine sandy loam	11,008	1.8
Norfolk loamy fine sand	22,272	3.5	Coxville loam	13,184	2.1
Norfolk loamy sand	5,824	.9	Portsmouth fine sandy loam	23,680	3.8
Norfolk fine sand	4,160	.7	Portsmouth sandy loam	2,048	.3
Norfolk sand	2,944	.5	Portsmouth loam	52,992	8.4
Ruston fine sandy loam	9,280	1.5	Plummer sand	1,664	.3
Ruston sandy loam	7,040	1.1	Plummer loamy fine sand	11,456	1.8
Ruston loamy sand	1,920	.3	St. Lucie sand	192	.1
Cuthbert fine sandy loam	10,432	1.7	Cahaba fine sandy loam	384	.1
Marlboro fine sandy loam	3,968	.6	Kalmia fine sandy loam	3,840	.6
Marlboro sandy loam	1,536	.2	Kalmia sand	6,592	1.1
Dunbar fine sandy loam	66,624	10.6	Leaf very fine sandy loam	6,336	1.0
Dunbar sandy loam	17,856	2.8	Johnston loam	86,912	13.8
Blanton fine sandy loam	2,368	.4	Congaree silty clay	31,616	5.0
Blanton sandy loam	1,216	.2			
Blanton fine sand	2,816	.4	Total	627,840	
Scranton loamy sand	2,112	.3			
Lenoir fine sandy loam	11,904	2.3			
Flat phase	2,240				

NORFOLK FINE SANDY LOAM

Norfolk fine sandy loam in forested areas has a surface soil of dark-gray loamy fine sand or light fine sandy loam, passing, at a depth ranging from 3 to 5 inches, into a subsurface soil of yellowish-gray mellow loamy fine sand or light fine sandy loam which grades at a depth ranging from 8 to 12 inches into pale-yellow mellow light fine sandy loam. The subsoil, beginning between depths of 14 and 24 inches, is yellow, crumbly, friable fine sandy clay, firm but not compact. It is underlain at a depth ranging from 30 to 36 inches by pale-yellow fine sandy clay, generally mottled faint red and reddish brown. At an average depth between 40 and 48 inches is the substratum or partly weathered parent material, which is slightly compact but more friable than the subsoil and is pale yellow mottled with pale grayish yellow and red, the red spots being granular and more gritty, that is, sandier than the grayish-yellow spots.

In cultivated fields the surface soil is light gray to plow depth, which varies from 5 to 8 inches, and in fields long under cultivation there is less fine material. In the northeastern part of the county,

around Nesmith and Henry, the surface soil is dark-gray very fine sandy loam and the subsoil is splotched with light red or brown. In the northern part of the county the depth to the subsoil is greater than in other parts, ranging from 24 to 30 inches.

The surface relief ranges from level to gently sloping and undulating. Surface drainage is good, and underdrainage is well established, owing to the structure of the subsoil. Both surface soil and subsoil are fairly retentive of moisture.

This soil occurs in irregular elongated areas, rarely more than three-quarters of a mile wide, in some places extensively developed along swamps and generally broken by numerous lateral stream ways. Although the largest areas are in the northeastern part of the county, particularly in the Indiantown section, the soil is widely distributed. Together with its deep phase, it occupies 105.3 square miles.

Norfolk fine sandy loam is probably the most important agricultural soil of the county. It is easily plowed and cultivated, forming a mellow seed bed with a minimum of preparation. It can be plowed readily following rains, and its tendency to crust is not great. There is some tendency to leaching of fertilizers in excessively wet seasons, but this is not so great as on the lighter soils. About two-thirds of the land is cleared and under cultivation, being used for all crops common to this region. Corn, cotton, tobacco, hay, oats, and sweetpotatoes are the principal crops, ranking in acreage in the order named. Potatoes, beans, peas, and leguminous crops such as soybeans, velvetbeans, vetch, and red and bur clovers do well and should be more extensively grown.

This soil is one of the best in the Atlantic coastal plain for tobacco and truck crops. Yields of tobacco usually range from 800 to 1,200 pounds to the acre, although yields as high as 1,500 pounds have been obtained.

This land under preweevil conditions produced about 1 bale of cotton to the acre. At present the yields range from about one-fourth to one-half bale on well-fertilized, well-tended land. Cotton receives from 400 to 600 pounds of a 3–8–3[4] commercial fertilizer to the acre. Most growers use this higher grade, as there is no great danger of loss from leaching on this land.

Corn yields from 25 to 45 bushels to the acre when grown on a semi-Williamson plan. Oats yield from 20 to 45 bushels. They receive a top-dressing of 75 to 125 pounds of nitrate of soda to the acre, with no fertilizer at planting except that which may remain from former crops. The yields of hay range from 1 to 1½ tons to the acre, of sweetpotatoes from 100 to 250 bushels, of potatoes about 100 bushels, of which from 50 to 60 bushels grade as No. 1 commercial potatoes. Yields of beans and peas compare favorably with those obtained on other soils.

Norfolk fine sandy loam, deep phase.—The deep phase of Norfolk fine sandy loam is essentially the same as the typical soil except that the yellow fine sandy clay subsoil lies from 20 to 30 inches below the surface. Soil of this phase is mapped in various parts of the county and is closely associated with the typical soil, the most extensive bodies being in the northeast part, in the vicinity of Henry and near Lake Swamp.

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

This deep soil is fertilized and handled in about the same way as typical Norfolk fine sandy loam. However, it is not so strong a soil, but it is well suited to tobacco, and a substantial acreage is devoted to that crop. The growing of corn is recommended on the strict Williamson plan, as leaching is more excessive than on the typical soil. The land is more retentive of moisture in dry seasons than Norfolk fine sand, and crops in general make better yields.

NORFOLK SANDY LOAM

Norfolk sandy loam is rather widely distributed in the southern and eastern parts of the county, occurring on well-defined ridges and along bluffs, in elongated areas from one-fourth to 1 mile wide and in many places several miles in length. The largest single area lies southeast of Greelyville. The land is level or gently rolling and is naturally well drained throughout. It differs from Norfolk fine sandy loam mainly in its coarser texture. In the bodies occurring in the southeast part of the county both the soil and subsoil are mainly coarse in texture. Norfolk sandy loam is used for practically the same crops as Norfolk fine sandy loam, but more of it is devoted to the production of cotton and less to tobacco. The yields of the various crops, and the cultural and fertilizing methods are essentially the same as those on Norfolk fine sandy loam. The coarser texture of this soil allows fertilizer to leach out readily, and for this reason it is not advisable to apply all the fertilizer at one time.

Norfolk sandy loam, deep phase.—Norfolk sandy loam, deep phase, differs from the typical soil mainly in having greater depth to the sandy clay subsoil, which lies from about 28 to 32 inches below the surface. The phase is closely associated with the typical soil, occurring on slightly higher positions within areas of Norfolk sandy loam. About the same crops are grown as on the typical soil, but yields are slightly lower, especially of the staple crops.

Table 5 shows the results of mechanical analyses of samples of the surface soil, subsurface soil, and several layers of the subsoil of typical Norfolk sandy loam.

TABLE 5.—*Mechanical analyses of Norfolk sandy loam* [1]

No.	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*
243759	Surface soil, 0 to 6 inches	0.8	14.5	22.6	44.9	5.8	8.0	3.5
243760	Subsurface soil, 6 to 10 inches	1.0	13.7	22.4	42.0	4.8	9.6	6.3
243761	Subsoil, 10 to 18 inches	.7	11.9	19.2	36.0	4.3	9.6	18.2
243762	Subsoil, 18 to 30 inches	1.5	13.7	19.1	35.0	3.7	8.3	18.7
243763	Subsoil, 30 to 42 inches	1.2	12.3	18.4	39.0	4.6	8.7	15.7
243764	Subsoil, 42 to 60 inches	1.0	12.9	19.1	31.8	3.4	9.5	22.2

[1] After treatment with hydrogen peroxide.

NORFOLK LOAMY FINE SAND

Norfolk loamy fine sand occurs on broad flattened interior ridges in the northern part of the county, a typical ridge extending from near Brockington northeast to the county line. Other large developments extend along the south side of Lake Swamp around to Outland

on the Georgetown County line. Fair-sized areas are scattered over the northern part of the county between Hebron and Workman.

The surface soil of Norfolk loamy fine sand in virgin forest areas has a ½-inch surface layer containing much organic matter or leaf mold below which is dark loamy fine sand to a depth of 3 or 4 inches. This grades into a grayish-brown loamy fine sand or fine sand layer 2 or 3 inches thick which in turn merges into grayish-yellow mellow loamy fine sand extending to a depth of 12 or 15 inches. Below this is yellow loamy mellow fine sand which grades at a depth ranging from 20 to 24 inches into friable and crumbly yellow fine sandy loam mottled faintly, in places, with reddish brown. Below 36 or 40 inches is yellow, mottled with reddish brown, loamy fine sand which extends several feet to the clayey substratum common to the region. In cleared fields the surface soil is gray to plow depth, and in many places there is a grayish-yellow zone between this and the bright-yellow subsoil.

In general, areas of this soil are fairly uniform, but there are some variations. On the flatter or central parts of the broader ridges and on the sloping edges the surface soil is darker and the deep subsoil is more mottled with gray. In the vicinity of Nesmith is an area of very fine loamy sand, in which the subsoil, instead of becoming lighter in texture, below a depth ranging from 30 to 36 inches becomes slightly heavier.

The surface relief is flat or undulating, and surface drainage is well established. Subsurface drainage is interfered with to some extent by the water table of the surrounding region. Local ditching has been resorted to in places to remove the underground water during rainy seasons.

This is an important soil as much of it lies in the section where tobacco is extensively grown. About two-thirds of it is cleared and under cultivation. In reasonably dry seasons it produces good crops and does not seem to suffer from lack of moisture, but in wet seasons the fertilizer leaches out badly. Corn, cotton, tobacco, oats, sweetpotatoes, and hay are the principal crops. This soil could be used more extensively for truck crops, such as beans, peas, potatoes, cucumbers, squash, and melons, and for such legumes as velvetbeans, vetch, and cowpeas.

Crop yields on this soil are lower than on Norfolk fine sandy loam. Tobacco yields from 500 to 800 pounds to the acre, but the grade is the best produced in the county and the quantity of leaf fully justifies a greater acreage. The fertilizer used is approximately the same as on Norfolk fine sandy loam, and the cultural methods in general are similar to those on the lighter soils.

NORFOLK LOAMY SAND

Norfolk loamy sand occurs on well-drained level or undulating areas extending back from one-fourth to one-half mile along the bluffs, bordering the swamps on the southern margin of Lake Swamp, and north of Outland on the Georgetown County line. This soil is practically the same as Norfolk loamy fine sand in general character and color of the soil and subsoil, but it has a coarser texture and is more open. About two-thirds of the land is under cultivation, mainly to cotton and corn, with small acreages devoted

to tobacco, sweetpotatoes, and other crops. The yields obtained, the amount and kind of fertilizer used, and the cultural methods are practically the same as those on Norfolk loamy fine sand.

NORFOLK FINE SAND

Norfolk fine sand, where forested, has a 2 or 3 inch surface layer of dark-gray fine sand mixed with organic matter. This grades into a grayish-yellow fine sand subsurface layer not more than 2 or 3 inches thick, which in turn grades into yellow fine sand slightly stained with organic matter and extending to a depth ranging from 7 to 10 inches, at which depth it merges with the subsoil of yellow loose mellow fine sand. At a depth ranging from 24 to 30 inches below the surface the subsoil is pale-yellow sand, in places somewhat spotted with yellow loam. This layer grades into pale-yellow or whitish sand. In plowed fields the soil is grayish yellow or light gray to a depth of 5 or 6 inches, and it contains little organic matter.

Norfolk fine sand is typically developed on undulating ridges and is locally termed "sand ridge." In places near the Black River swamp it is rolling and is known locally as "sand hills." The largest area extends north from Kingstree along the Atlantic Coast Line Railroad almost to Brockington. Several small areas occur on a ridge south of Black River in the vicinity of Wee Nee School, and scattered areas are in the north and east parts of the county.

Drainage is thorough and inclined to be excessive to the extent that crops suffer in dry seasons. About four-fifths of the land has been cleared and about one-half is now used for crops. The same general methods of cultivation and fertilization are followed as on Norfolk loamy sand. Crop yields, however, are very much smaller, owing to the low producing power of the land, burning out of crops in dry weather, and leaching of fertilizer in wet seasons. Much of the corn grown does not average more than 10 bushels to the acre. Velvetbeans make good growth and a fairly good yield of seed. Oats make low yields, except in favorable seasons and when heavily top-dressed with nitrate of soda.

This soil is used in other counties of the State for dewberries and peaches, and to less extent for small fruits. It is suited to the production of velvetbeans, cowpeas, and vetches, and can be utilized for the growing of such crops as watermelons, cantaloupes, and cucumbers. It produces a good grade of bright tobacco but the yields are low.

NORFOLK SAND

Norfolk sand is medium or coarse in texture throughout the soil profile, and the color profile is similar to that of Norfolk fine sand. It occurs as well-defined sand ridges between bays or along the edges of swamps, in scattered areas southwest of Hebron, northwest of Kingstree, around Salters, and along the Black River swamp and the Santee River swamp. In the vicinity of Salters the subsoil is grayish yellow or mottled gray and yellow, and the areas are rolling and rather badly leached. The cultivated areas of Norfolk sand are devoted to the same crops as are grown on Norfolk fine sand, but the yields are slightly lower, owing perhaps to a greater amount of leaching. Under present economic conditions, the land should be devoted to forest.

RUSTON FINE SANDY LOAM

Ruston fine sandy loam occurs on undulating land along the edges of swamps. The surface soil in forested areas has a 1-inch layer of dark brownish-gray fine sandy loam or loamy fine sand, mixed with leaves and organic matter, below which, to a depth of 5 or 6 inches, is yellowish-brown loamy fine sand or light fine sandy loam which gradually changes to brownish-yellow mellow loamy fine sand or fine sandy loam. The subsoil, beginning at a depth ranging from 12 to 20 inches, is reddish-yellow, reddish-brown, or brownish-yellow friable crumbly fine sandy clay, firm but not compact. Below a depth ranging from 24 to 36 inches is brownish-yellow crumbly fine sandy clay, and below 36 or 40 inches is yellow, mottled with red, fairly compact friable fine sandy clay, passing at depths ranging from 48 to 60 inches, into mottled yellow, red, and gray fairly compact but brittle sandy clay.

In cultivated fields the surface soil to a depth of 6 or 8 inches is yellowish-brown or gray mellow fine sandy loam or loamy fine sand.

In some areas of this soil occurring on ridges the yellowish-red fine sandy clay subsoil averages much deeper than in the typical areas. It lies at a depth ranging from 24 to 36 inches and is not quite so heavy as the remainder of the soil. This variation occurs only in several small areas along McKnight, Paisley, and Lake Swamps, along the swamp of Black Mingo Creek, and in one area just north of Belsers Crossroads. These areas are not quite so productive as the rest of the soil.

Ruston fine sandy loam is widely distributed over the county, mainly within a belt extending from northeast to southwest through the center. The largest areas are near Black River and its tributaries within the belt mentioned, around the junction of Black Mingo Creek swamp, Cedar Swamp, and Paisley Swamp, along Lake Swamp, and to less extent in the territory adjacent to the upper stretches of the Santee River swamp.

Ruston fine sandy loam covers 14.5 square miles, and is, agriculturally, one of the most important soils of the county, owing to its inherent productivity. About four-fifths of the land is cleared and used for crops, and practically all the land has been under cultivation at some time. Only a few abandoned fields are found. Along the streams, where the relief is strongest, the soil is subject to some erosion, and much of the eroded land has been reforested. In places the surface soil is very thin, owing to sheet erosion.

Practically all varieties of crops grown in the county are produced on this soil. Corn and cotton are the leading crops. Tobacco is not so extensively grown as on the Norfolk soils. Peas, beans, and potatoes are produced for the early market in the vicinities of Gourdin and Kingstree. Corn grown on the semi-Williamson plan yields from 25 to 45 bushels to the acre, where fertilized with from 200 to 400 pounds of a 3–8–3 or 2½–8–1 fertilizer and from 75 to 150 pounds of nitrate of soda. Tobacco yields from 500 to 800 pounds but the crop is more uncertain than corn, is subject to disease, and does not produce the best grade. Consequently many owners of this kind of land have abandoned tobacco growing. Oats yield from 30 to 65 bushels, depending on the amount of nitrate of

soda used. Cotton under preweevil conditions produced, with normal fertilization, from 1 to 1½ bales. Truck crops make good yields in normal seasons.

RUSTON SANDY LOAM

Ruston sandy loam occurs mainly in the southern half of the county, the largest areas being near Murrays Ferry bridge and southeast of Gourdin. Much of this soil is developed along the edges of the larger streams from Gourdin west to the Clarendon County line. Owing to its undulating or gently rolling relief, the soil is well drained.

This soil differs from Ruston fine sandy loam mainly in being coarser in texture and slightly more friable. Along Johnson Swamp between Earle and West Andrews is an area of sandy loam having a heavy subsoil of reddish-yellow clay mottled with bluish gray, ocherous red, and brown. In many places, particularly along the edge of the Santee River swamp and in the vicinity of Gourdin the texture is much coarser than typical. In a few places noticeable amounts of small rounded white quartz gravel occur. South of Gourdin and on the Murrays Ferry road between the crossroads and the bridge, the bodies of this soil have a much redder subsoil than the rest of the areas.

Ruston sandy loam is one of the most productive soils in the county, and more than three-fourths of it is under cultivation. Tobacco is grown to less extent than corn and cotton. Sweetpotatoes, peas, beans, potatoes, oats, and some hay are grown. The yields of all of these crops except cotton and tobacco compare favorably with those of any soil in the county. The yields of tobacco are high, but the quality is not so good as that grown on the Norfolk soils. The cultural methods and fertilizer used on this soil are identical with those used on Ruston fine sandy loam.

RUSTON LOAMY SAND

Ruston loamy sand occurs on well-drained undulating land along swamp edges, where surface drainage and underdrainage are both well established. Forested areas have a 1 or 2 inch layer of grayish soil mixed with organic matter, overlying brown loamy sand which grades at a depth of 4 or 6 inches into yellowish-brown mellow loamy sand. This extends to a depth ranging from 15 to 20 inches, then passes through an intergrade, from 3 to 6 inches thick, of mixed material, below which is friable and crumbly reddish-brown loamy sand or light sandy loam. This layer extends to a depth of 3½ or 4 feet where it grades into yellow or yellowish-brown loamy sand or sand which in places is mottled with red in the lower part of the substratum. In some areas along Broad Swamp and Black River and near the junction of Black Mingo Creek swamp with Cedar and Paisley Swamps finer sand particles are predominant.

This soil is nearly all cleared, but only about one-half is used for crops. Considerable areas have been abandoned during the last few years, owing to the boll weevil and the loss of fertilizer by leaching.

Cotton, corn, tobacco, cowpeas, and sweetpotatoes are the leading crops. Yields are lighter for practically all crops than on the heavier Ruston soils. Tobacco yields better and is usually of a better grade. The cultural methods and fertilizing practices follow closely those on Norfolk loamy sand and the lighter soils of the Norfolk series.

This land could be more extensively used for tobacco, beans, peas, and leguminous hay crops such as velvetbeans and vetch. It is necessary to use complete fertilizers. Berry crops, peaches, and small fruits should prove profitable. The soil is fairly well suited to asparagus.

CUTHBERT FINE SANDY LOAM

Areas of Cuthbert fine sandy loam are widely scattered over the uplands of the county, but they occur most extensively in the southeastern part. In forested areas a ½-inch layer of dark grayish-brown loam mixed with organic matter covers the surface soil of dark-brown light fine sandy loam. At a depth ranging from 4 to 6 inches the material grades into yellowish-brown mellow light fine sandy loam. The subsoil, beginning at a depth of 12 or 15 inches, is a reddish-yellow fine sandy clay intergrade, 4 or 5 inches thick, which passes into yellowish-red or reddish-brown hard tough compact clay or fine sandy clay with an irregular angular breakage along cracks. The soil material is friable and crumbly when broken down. The freshly broken and freshly cut surfaces show much yellow. Between depths of 26 and 30 inches the subsoil merges into the substratum of yellow, mottled with red, compact sandy clay of the same structure as the above layer, but which has a tendency to become columnar along the edges of ditch banks. Below a depth ranging from 36 to 40 inches is sandy clay mottled yellow and red and streaked with gray. The bluish-gray streaks are clayey and the red, sandy. The preceding description applies to the soil as developed in the southeastern and eastern parts of the county. In other places the surface soil is very dark yellowish-brown fine sandy loam underlain by a yellowish-brown subsurface soil below a depth of 6 inches. This layer grades, at a depth of 10 or 12 inches into a pale yellowish-brown or yellowish-red tough compact clay subsoil which becomes indurated from exposure and breaks into irregular angular blocks having a semicolumnar structure, the fragments of which are tough and hard when dry.

Areas of Cuthbert fine sandy loam are undulating, and in spite of the heavy subsoil and substratum are fairly well drained and aerated. The largest areas are along the Santee River swamp bluffs from the Leneuds Ferry road to 3 miles southeast of Gourdin, and along both sides of the Black River on both sides of the swamp from Boswells Beach to the east county line. Small areas occur in the vicinities of Rhems and Belin Church. The areas along the north side of the Black River swamp below Boggy Swamp have uniformly very fine sandy surface soils.

About three-fourths of the land is cleared and under cultivation. Cotton, corn, hay, tobacco, and oats are the principal crops. Where the soil is properly handled, the yields compare favorably with those on Ruston fine sandy loam. Cotton formerly yielded from about three-fourths to 1 bale to the acre, but at present the average is less than one-fourth bale; corn yields from 20 to 40 bushels; oats, from 15 to 40 bushels, according to fertilization and culture; and cowpea hay, from one-half to 1½ tons. The soil is used with fair success for peas, beans, and potatoes.

Cultural methods and fertilizing practices are essentially the same as on Ruston fine sandy loam. The soil is similar to Ruston fine sandy loam, but it has a much heavier, tighter, and more compact subsoil.

MARLBORO FINE SANDY LOAM

Marlboro fine sandy loam, where forested, has a 3 or 4 inch surface layer of dark grayish-brown mellow fine sandy loam which grades into a dull yellowish-brown fine sandy loam subsurface layer. Below a depth ranging from 4 to 6 inches is friable and crumbly, yellow light fine sandy clay, underlain at a depth ranging from 12 to 20 inches by yellow fine sandy clay, firm, but granular or crumbly, and slightly sticky. This layer extends to a depth of about 30 inches below the surface, where it grades into yellow, mottled with red, firm and slightly compact fine sandy clay having a somewhat angular breakage.

In plowed fields the surface soil has a yellowish-brown cast, and it has a tendency to clod and to stick to the plow when wet. This is a shallower soil than Norfolk fine sandy loam. Little variation occurs in areas of this soil except along the breaks to streams, where narrow strips have a reddish subsoil, which in some places resembles Ruston fine sandy loam and in others is closely related to Cuthbert fine sandy loam. In the vicinity of Trio the relief of the land is less pronounced, and the surface soil is darker than elsewhere. In places a few iron concretions are scattered on the surface and throughout the soil.

Drainage is well established, but underdrainage is not quite so free as in the Norfolk and Ruston soils. The surface soil suffers very little from erosion. The subsoil holds moisture well and crops rarely suffer from lack of moisture even in dry seasons, and fertilizers do not leach rapidly.

Marlboro fine sandy loam is widely distributed over the county, small areas occurring in nearly all parts. It is one of the strongest soils in the county, and although inextensive it is very important agriculturally. About 90 per cent of the land is used for crops, the main crops being cotton, corn, hay (largely cowpea), tobacco, and oats. This is one of the best cotton soils in this region. Prior to 1922, this land, with fair management and good fertilizer, produced from three-fourths to 1¼ bales to the acre year after year, when other soils that often produced higher yields failed. Under weevil conditions cotton produces from about one-fourth to one-half bale to the acre. Corn yields from 20 to 45 bushels, according to the fertility of the land and method of cultivation. Probably more corn is grown on the old plan, that of sowing fertilizer in the rows before planting, than on any other soil. Oats yield from 25 to 50 bushels to the acre, tobacco from 500 to 800 pounds, and cowpeas for hay from 1 to 1½ tons. The same fertilizing practices are followed as on Norfolk fine sandy loam.

This land has a comparatively high sale value. Farms including this soil together with soils of less value command from $25 to $50 an acre. Land of this kind is recommended for general farming and livestock raising. The planting of cotton should not be abandoned but should be supplemented by forage crops for feeding livestock. The soil is fairly well suited to truck crops, but earliness must be

sacrificed to some extent, as the soil does not warm up quite so early as the Norfolk soils. However, there is less danger from leaching of fertilizer, and such crops as beans and potatoes should prove profitable.

MARLBORO SANDY LOAM

Marlboro sandy loam is similar to Marlboro fine sandy loam in surface relief and drainage. The color of the surface soil and subsoil is practically identical with that of Marlboro fine sandy loam, but the texture is coarser. This soil occurs mainly in the southern part of the county on the lower ridges, associated with soils of the Lenoir and Dunbar series, and also along the edge of Kingstree Swamp. It is one of the best soils in the county for the staple crops, especially cotton. The yields obtained, fertilizer treatments practiced and cultural methods are practically the same as those on Ruston sandy loam and Norfolk sandy loam.

DUNBAR FINE SANDY LOAM

The 3 to 5 inch layer of Dunbar fine sandy loam is dark-gray fine sandy loam. It is underlain by light-gray fine sandy loam to a depth of 6 or 8 inches. This layer, in turn, grades into yellow, friable fine sandy loam which extends to a depth ranging from 12 to 16 inches. The subsoil is mottled gray and yellow firm but friable fine sandy clay with red mottles occurring at depths between 20 and 24 inches. This layer passes into the partly weathered substratum at an average depth of 36 inches. Several variations of the soil occur, some of the higher areas grading into the Norfolk soils and some of the lower ones into the Coxville soils. In the higher areas the red-mottled subsoil lies at a comparatively great depth, whereas in the lower-lying bodies the red mottles occur between depths of 15 and 20 inches. There is some range in the compactness, friability, and plasticity of the subsoil. In areas closely associated with soils of the Norfolk, Scranton, and Plummer series, the depth of the clayey subsoil is comparatively great, being about 30 inches. In the southern part of the county where the soil is intermixed with soils of the Lenoir series the subsoil is shallower, heavier, and tougher. Bordering the Florence County line areas of Dunbar and Portsmouth soils in Williamsburg County have been mapped adjoining Coxville soils in Florence County. This is owing to a more detailed separation in mapping the soils since the survey of Florence County was made in 1914.

Areas of Dunbar fine sandy loam are level or gently rolling, and drainage is good. Much of the soil can be cultivated without artificial drainage, but large areas will require ditching to render the land suitable for cultivation. Dunbar fine sandy loam is an important agricultural soil, owing to its large area and wide distribution.

Probably from 40 to 50 per cent of the land is cleared and under cultivation, with about 5 per cent of this in improved pasture. Cotton and corn occupy the greatest acreages, with hay, oats, and tobacco following. Nearly all kinds of vegetables common to this region are grown in home gardens. Peas, beans, cucumbers, and potatoes are grown for market. Fruit, including pears, plums, peaches, and figs, is grown only in small orchards. A few cattle, goats, and hogs are raised.

Crop yields are slightly lower than on Norfolk fine sandy loam. Cotton yields one-fourth bale to the acre under weevil conditions. Corn when fertilized yields from 25 to 30 bushels, and when no fertilizer is used from 15 to 20 bushels. Oats yield from 25 to 35 bushels when from 75 to 100 pounds of nitrate of soda to the acre is used and from 35 to 50 bushels when an application of 250 pounds of phosphate precedes the crop or 300 pounds of nitrate of soda is used.

Much of the land is farmed by tenants, and the farm equipment is inadequate. The total quantity of fertilizer used is small, and the farms in general are not well managed.

Strawberries do well on this soil and are successfully grown on the same type of soil in North Carolina and in other parts of South Carolina. Cabbage does well; also such truck crops as beans, turnips, tomatoes, beets, asparagus, and potatoes. The sweetpotatoes grown on this soil are better for marketing than those produced on sandier soils.

DUNBAR SANDY LOAM

Dunbar sandy loam occurs in irregular areas scattered over the county, mainly on the low ridges along the borders of swamps. It has an undulating or very gently rolling relief and fairly good surface drainage. It differs essentially from Dunbar fine sandy loam in that it has coarser-textured surface soil and subsoil, although the subsoil is not quite so heavy and compact as that of Dunbar fine sandy loam. A variation of this soil occurs about 2 miles east of Brockington. Here the deep subsoil contains partly decomposed shell rock in various proportions and some of this rock is present on the surface. Such areas are more productive than typical Dunbar sandy loam.

Crop yields on Dunbar sandy loam are slightly higher, owing perhaps to slightly better drainage, than those obtained on Dunbar fine sandy loam, but they are lower than the yields obtained on Norfolk sandy loam or Marlboro sandy loam. The same general methods of cultivation and fertilization prevail on this soil as on the Norfolk and Marlboro sandy loams.

BLANTON FINE SANDY LOAM

Blanton fine sandy loam differs from soils of the Norfolk series in that it has a leached-out or light-gray appearance in the surface soil and a light-colored mottled subsoil. In forested areas, the upper 1 or 2 inch layer consists of dark-gray loamy fine sand which is underlain by light-gray or yellowish-gray loamy fine sand extending to a depth of 12 or 15 inches. This material grades into grayish-yellow loamy fine sand with whitish-gray mottles and, at a depth ranging from 20 to 24 inches, grades into yellow fine sandy loam containing streaks and blotches of grayish white. The material below depths ranging from 30 to 36 inches is generally pale-yellow friable fine sandy clay containing some light-red and light-gray mottles.

Areas of this soil are undulating or gently rolling, and natural surface and internal drainage are well established. About two-thirds of the soil has been cleared, and about half of the cleared area is used for the production of cotton, corn, and to less extent tobacco,

cowpeas, and sweetpotatoes. The cultural practices and amount and kind of fertilizer used on this soil are similar to those applied to Norfolk fine sandy loam. The yields are slightly less than those obtained on the Norfolk or Marlboro soils. This soil is suited to practically the same crops, and suggestions for improvements would be practically the same as for Norfolk fine sandy loam.

BLANTON SANDY LOAM

Blanton sandy loam is similar to Blanton fine sandy loam, except that the texture ranges from medium to coarse. Depth to the sandy clay subsoil is greater in most areas, and the top of the substratum is in many places slightly indurated or hardened, holding moisture above that level and causing strong mottling in the horizon directly above.

Areas of this soil are undulating, and surface drainage is good. The largest areas are in the vicinity of Salters. Much of the land has been cleared and used for crops, but abandoned fields are common.

The crops grown, cultural methods, and fertilizing practices are essentially the same as on Blanton fine sandy loam. Yields are much the same on the two soils except that the sandy loam is more subject to leaching, and in wet seasons crops suffer from this cause. Crop yields vary more with the seasons than on Blanton fine sandy loam and far more than on soils of the Marlboro and Dunbar series.

BLANTON FINE SAND

Blanton fine sand occurs mainly in the eastern part of the county from Old Morrisville to the region just north of Rome, and in small areas north and southeast of Kingstree.

In forested areas the surface soil is dark-gray fine sand containing leaves and roots in the topmost 1 or 1½ inches, and it overlies gray or dark-gray loose and incoherent fine sand blotched with white. This layer extends to a depth of 10 or 12 inches and is underlain by pale-yellow, mottled with white, fine sand which grades, at a depth ranging from 30 to 36 inches, into grayish-white sand streaked with yellow. The soil is loose and open throughout. Most of the areas consist of fine sand but several areas in the western part of the county have a very fine sand texture. These areas are inclined to be slightly more compact or firm, especially when wet.

This soil occurs on well-drained ridges and tongues extending between swamps or along the edges of swamps and on high flats. In both positions the surface soil and subsoil are well drained.

The soil is not extensive and not important, really representing a poor grade of Norfolk fine sand. Crops, cultural methods, and fertilization practices are about the same as on Norfolk fine sand, but crop yields are lower. Tobacco makes fair returns in favorable seasons. This is one of the marginal soils of the region, on which it is doubtful whether crop production should be attempted under present conditions. It is best suited to forestry.

SCRANTON LOAMY SAND

In forested areas the surface soil of Scranton loamy sand consists of 4 or 5 inches of very dark-gray or almost black humus-filled loamy

sand in which the medium and finer particles predominate, although some coarse white quartz grains show on the surface in places. The subsurface soil contains very little or no dark humus and is brown loamy sand which, at a depth of about 10 inches, becomes light brownish-yellow loamy sand containing slightly more silty material than is found in the overlying layers. Between depths of 20 and 30 inches yellow loamy sand or very light friable sandy loam generally occurs. In some areas the material may be moderately heavy but not compact sandy loam. This layer is underlain by coarser and looser loamy yellow sand which becomes lighter colored with depth. At a depth of about 50 or 60 inches heavy light-colored clay is reached which is evidently the upper limit of the heavy clay beds that so generally underlie the soils of this region.

The preceding description applies to the areas of this soil occupying the flat uplands between Lynches River and Muddy Creek in the northeast corner of the county. On the slopes toward the streams the soil grades into Norfolk loamy fine sand or is bordered by patches of Dunbar and Ruston soils. In small scattered areas in the northern part of the county the surface soil is dark-gray loamy sand, and the subsoil, which lies at a depth ranging from 18 to 24 inches, is yellow, mottled with gray and red, fine sandy loam, sandy loam, or light sandy clay. The largest areas of Scranton loamy sand occur in the extreme northeast corner of the county, and many smaller areas are in the northwest corner. Where it has been tilled for a few years the surface soil assumes a dull-gray or somewhat ash-gray color with a bleached appearance in the lightest and coarsest textured areas.

Scranton loamy sand occurs in flat level areas, and natural drainage is imperfect. After heavy rains the soil remains wet for a considerable period of time and the water table may be less than 30 inches below the surface. Satisfactory moisture conditions on this soil can be maintained only when the rainfall is moderate.

The greater part of the land is uncleared, and the small cleared areas are used for cotton, oats, cowpeas, hay, and truck crops. Crop yields are fairly good in all except wet seasons, when both drowning out of crops and leaching of fertilizers occur. Truck crops make fair returns. This is a good soil for strawberries, cabbage, beans, turnips, English peas, lettuce, and potatoes.

LENOIR FINE SANDY LOAM

The surface soil of Lenoir fine sandy loam consists of gray or light-gray fine sandy loam to a depth ranging from 6 to 12 inches. The subsoil is brownish-yellow heavy slightly plastic fine sandy clay containing light-gray and some light-red mottles. This layer extends to a depth of about 30 inches, below which the light-gray color predominates. In many places where this soil borders Lenoir sandy loam the upper part of the subsoil contains a large quantity of light-red mottles and streaks. The subsoil throughout is rather compact, tough, and heavy, but on drying cracks into angular blocks along rather definite cleavage planes and finally crumbles into small subangular aggregates. In most places marbled bluish-gray, yellow, brown, and light-red tough sandy clay is present below depths of 40 or 45 inches.

Areas of this soil are undulating or slightly sloping, and they are closely associated with Norfolk fine sandy loam and Cuthbert fine sandy loam areas. Surface drainage is good on the undulating or more sloping areas but poor on the flatter areas. The heavy subsoil holds moisture exceedingly well but does not allow free drainage of rain water. A large part of the land has been cleared and was at one time used for the production of cotton, tobacco, corn, and oats. In the vicinity of West Andrews some truck crops are grown, especially on the areas having deeper surface soils. The cultural methods practiced and the amount of fertilizer used are similar to those on Norfolk fine sandy loam or Cuthbert fine sandy loam.

Lenoir fine sandy loam, flat phase.—Lenoir fine sandy loam, flat phase, differs from the typical soil in that it occurs on flat areas and that both surface drainage and internal drainage are poor. The surface soil is generally shallow and slightly darker than in the typical soil, and the heavy subsoil lies near the surface. Land of this kind requires artificial drainage to render it suitable for cultivation. Very little of this flat soil is farmed. It produces the best yields in rather dry seasons.

LENOIR SANDY LOAM

Lenoir sandy loam differs from Lenoir fine sandy loam mainly in being coarser in texture and somewhat more friable. In some places the surface soil is slightly lighter in color and deeper than that of Lenoir fine sandy loam. The more friable consistence affords better drainage and allows this soil to warm up more quickly than the fine-textured member of the series. This soil occurs in small areas in the southeast corner of the county and in scattered areas southwest of Greelyville.

Lenoir sandy loam is used for general farm crops, and for sweetpotatoes, potatoes, and truck crops. In some sections of the State strawberries have been successfully produced on this type of soil. The better-drained areas and areas in which the surface soil is deeper can be used successfully for tobacco. Fertilizer requirements and general farming practices are the same as on the other sandy soils of the county.

COXVILLE FINE SANDY LOAM

In forested areas Coxville fine sandy loam has a surface layer of dark-gray or almost black fine sandy loam from 3 to 5 inches thick, underlain by light-gray or grayish-yellow fine sandy loam continuing to a depth ranging from 8 to 12 inches. The subsoil immediately below this level and extending to a depth ranging from 18 to 24 inches is mottled light-gray and yellow heavy fine sandy clay, below which is heavy tough clay or fine sandy clay mottled light gray, yellow, and bright red. In cultivated fields the surface soil to the depth of cultivation is light gray or ash gray.

This is the most extensive soil in the county and is widely distributed. It occurs on broad flats of level or very gently undulating relief. The largest areas lie in the central part of the county, and extensive flat areas are mapped between Greelyville and Trio. Surface drainage is naturally poor, and internal drainage is slow. The

soil requires artificial drainage in order to render it suitable for cultivation. This can be accomplished by open ditches and canals.

Probably less than 5 per cent of the land is under cultivation. It consists largely of open pine-woods land which is burned over each season and furnishes fairly good pasturage in spring and early summer. Cowpeas and crabgrass are grown for hay to a small extent, and some beans, peas, and broccoli are produced around Trio and in the vicinity of Cades. When this soil is properly drained, limed, and fertilized, good yields of corn, cotton, cowpeas, and oats may be expected, as it is about as productive a soil as Dunbar fine sandy loam. Around Chadbourn, N. C., and Conway, S. C., strawberries are successfully grown on a commercial scale on this type of soil, as are also cabbage and other truck crops around Meggett, S. C., and in the Monteith-Meinhard trucking section near Savannah, Ga.

COXVILLE SANDY LOAM

Coxville sandy loam differs from Coxville fine sandy loam in being coarser and slightly more friable. The subsoil lies between depths of 12 and 30 inches below the surface. This soil occurs on level or undulating areas and is, for the most part, poorly drained, though slightly better drained than Coxville fine sandy loam. Artificial drainage is necessary. Very little of the land has been cleared and farmed, but when drained and reclaimed it will be suited to the same crops as Coxville fine sandy loam.

COXVILLE VERY FINE SANDY LOAM

The surface soil of Coxville very fine sandy loam consists of dark-gray very fine sandy loam which grades at a depth of 4 or 6 inches into light-gray, friable very fine sandy loam. The subsoil, which lies at a depth of 10 or 12 inches, consists of mottled drab and yellow very fine sandy clay which is firm and plastic when wet and fairly tough but pervious. Below a depth of 18 or 20 inches bright-red mottles become pronounced. In poorly drained spots the surface soil to a depth of 4 or 5 inches is dark gray or almost black, and the subsoil is somewhat yellow. The red mottles here are brighter than typical.

Coxville very fine sandy loam occurs in large areas along the Georgetown County line between Black River and Black Mingo Creek, and also in small areas in the south-central part of the county. Land of this kind is fairly level or gently undulating and is known locally as pine savannas. Practically all of this soil is in longleaf pine forest, with an undergrowth of grass.

Because of the level surface and heavy subsoil the land requires artificial drainage before crops can be produced. Extreme care must be taken not to cultivate the soil when too wet, as puddling results and crop yields show a marked decrease. This soil is adapted to the same general range of crops as Coxville fine sandy loam.

COXVILLE LOAM

Coxville loam occurs on extensive pine flats or savannas in the northern part of the county in the vicinity of Cades and in the southern part south of Trio. The soil is similar in color to Coxville fine

sandy loam but is mellow and loamy. The subsoil also is similar to that of Coxville fine sandy loam. In the extreme northern part of the county the subsoil is not quite so heavy and contains more medium sand than the typical soil.

Included with this soil in mapping is an area of Coxville clay loam, about 6 miles southwest of Earle, which forms an eastward extension of Cedar Creek Bay. The surface is several feet higher than that of the bay but is slightly lower than the general level of the adjoining Coxville soils. A part of the area drains into Oak Ridge Bay. The soil here is black loam with abundant organic matter in the first few inches. The subsurface soil is light-gray very fine sandy loam, passing at a depth of 8 or 10 inches into gray plastic clay which becomes, with slight increase of depth, tight, tenacious clay faintly splotched with yellow and brownish stains. This material evidently extends to a depth of many feet and offers such resistance to water movement that natural underdrainage is lacking. A high ground-water level prevails during the winter. At times the surface is dry and the water table is apparently below the bottom of the depressions.

In the southern part of the county west of Oak Ridge Bay and Camp Pond Bay are small areas of clay loam. Here the surface soil is dark-gray loam from 1 to 4 inches thick grading into light-gray, mottled with yellow, clay loam which extends to a depth ranging from 5 to 8 inches. This included soil is not used for crops, but it is burned over and grazed. The land would be difficult to drain, as the heavy character of the subsoil prevents free movement of water. It is best adapted to grasses and, if reclaimed, could be used for grain crops.

Coxville loam is fairly extensive and is one of the potentially important agricultural soils in the county. The land is burned over each year and furnishes fair grazing during spring and early summer. A few areas are used in the production of corn, oats, cowpeas, and soybeans, and the yields are satisfactory in dry seasons. Like all soils of the Coxville series, this soil requires artificial drainage to reclaim it for crop purposes. When thoroughly drained, cleared, and limed, it will produce good yields of all the staple crops, as well as beans, peas, cabbage, and other truck crops.

PORTSMOUTH FINE SANDY LOAM

Portsmouth fine sandy loam occurs mainly in bays and low swales between ridges. The surface soil is black mellow fine sandy loam about 8 or 10 inches deep, and is underlain by a subsurface layer several inches thick of light-gray loamy fine sand or fine sandy loam grading into light-gray mellow fine sandy loam or fine sandy clay mottled and streaked with yellow. The subsoil consists of light-gray rather heavy sticky fine sandy clay which, at a depth of 20 or 24 inches, shows drab and yellow mottles.

Several variations from typical occur in mapped areas of this soil, mainly differences in relief and forest covering. In places the soil occupies saucerlike depressions or small bays within areas of Norfolk fine sandy loam. In such places the soil is uniformly black to a depth of about 10 inches, and there is very little yellow mottling in the subsoil. The forest growth in these small bay areas consists

almost entirely of cypress and black gum, with a fringe of gall berry and myrtle. The centers of the areas are usually inundated and support no undergrowth, except reeds in places. In the northeastern part of the county long, narrow, irregularly outlined areas or broad, oval depressions about stream heads are mapped in which the black soil layer is shallow and the yellow mottling in the subsoil is very pronounced. In places the subsoil is gray fine sandy clay specked with brown.

Another variation occurs as long, narrow strips around the margins of swamps. Such areas have dark-gray surface soils and light-gray subsoils, and in places the subsoil contains mottles typical of the Coxville soils. The surface is sloping, but the soil receives seepage water from higher-lying soils. This sloping land is mapped around the margins of sand ridges along the upper courses of Bennett, McGirt, and Thorntree Swamps.

Typical Portsmouth fine sandy loam occurs mainly on the margins of large bays, such as Smiths Bay, Alligator Bay, and Findley Bay, in the northern part of the county, and in small bays scattered over the entire county except those in the southeast corner. The surface is level, and drainage is very poor.

Very little of this soil is under cultivation. Where farmed it is devoted mainly to oats or corn. Oats yield from 20 to 40 bushels and corn from 14 to 35 bushels to the acre depending on the season and the newness of the land. Fertilizer is not commonly used. Superphosphate (acid phosphate) is sometimes applied at the rate of 200 or 250 pounds to the acre, and on some areas nitrate of soda is used as a top-dressing in fields that have been under cultivation for a long time.

Land of this kind is used largely as range for cattle, hogs, and goats. In its native condition it makes good pasture land for hogs. With thorough drainage and liming it is capable of producing good yields of most of the crops commonly grown in this region. It is best suited to such general farm crops as oats, corn, and sorghum and to such truck crops as cabbage, onions, cucumbers, lettuce, and strawberries. Even with good drainage the soil holds too much water in wet seasons for crops such as cotton and cowpeas, which require a well-aerated soil.

PORTSMOUTH SANDY LOAM

Portsmouth sandy loam is similar to Portsmouth fine sandy loam except that the texture of the surface soil is coarser and in some places the subsoil is slightly more friable. The surface relief and drainage are similar on these two soils. Portsmouth sandy loam occurs in small areas in the vicinity of Workman, around Butlers Bay, and in scattered areas in the northern part of the county. A group of small areas are southeast of Salters. Only a very small part of the soil is cleared and under cultivation. The recommendations suggested for the drainage, reclamation, and improvement of Portsmouth fine sandy loam apply equally well to this soil.

PORTSMOUTH LOAM

Portsmouth loam is widely distributed over the county, occurring in bays and depressions of various sizes, most of which support a growth of hardwoods, cypress, and gum.

A typical profile shows about 4 or 6 inches of almost black loam containing a quantity of finely divided organic matter, grading into dark-gray, faintly mottled with brown, fairly firm but friable loam. Below a depth of about 10 or 12 inches the material is loam or clay loam, not very compact but very sticky and of gray color with small yellow and brown mottles. Below 20 or 24 inches the subsoil is less compact, but slightly sticky, gray clay containing yellow mottles. Drainage is poor, and during wet seasons water stands on the surface. The soil condition is favorable for the accumulation of organic matter. None of the land is well enough drained to be used for crops, but much of it is in pasture. The higher areas support a growth of broom sedge in places, but most of the land supports no grass.

If properly drained this land has wonderful possibilities for growing corn, oats, and certain classes of truck crops such as cabbage, lettuce, celery, beans, and peas. At present the land has little value aside from that of the standing timber.

PLUMMER SAND

Plummer sand occurs in bays and depressions, which support a growth of pine or cypress, with some tupelo gum, gall berry, bay, and myrtle. Sand Bay northwest of Kingstree and Butlers Bay southwest of Greelyville are the largest areas.

In forested areas, the surface soil is dark grayish-brown or black sand containing considerable amounts of organic matter and roots. Below 4 or 5 inches the material is gray, and below 10 or 12 inches it is slightly compact brown sand. At a depth of 18 or 20 inches the subsoil becomes light brown or light grayish brown, and at 20 or 24 inches it merges into white incoherent sand. In places the surface soil is more gray and less brown, and the subsoil is pale gray or whitish gray.

The surface is level or gently sloping, and the land lies from 5 to 10 feet below the general level of the surrounding country. Natural drainage is poor, and water stands on the surface throughout most of the year, as the bays are generally without natural surface outlets, the water passing through underground channels or evaporating. Although some of the land has been drained, it is not used for cultivated crops, and much of it is pastured. Under drainage and cultivation the organic matter in the surface soil burns out within a few years, leaving mostly sand. It is doubtful if this land is worth draining, except as a health measure. It should remain forested.

PLUMMER LOAMY FINE SAND

Plummer loamy fine sand occurs on comparatively high interior flats, on gentle slopes, and around stream heads which receive seepage water. The surface soil is black loamy fine sand to a depth of 3 or 4 inches overlying a layer of gray loamy fine sand or fine sand which is streaked or specked with brown and in places is slightly compact. This layer is rarely more than 2 inches thick and overlies gray, streaked with yellow and brown, loamy fine sand which extends to a depth ranging from 24 to 30 inches, at which depth it is underlain by gray or whitish-gray water-soaked sand.

This soil is rather extensive, occurring mainly in the northern and eastern parts of the county and in one large area west of Greelyville. Drainage is poor. The forest growth is prevailingly longleaf pine, and the undergrowth is broom sedge. In places around stream heads, gall berry bushes, baybushes, and myrtle grow.

Probably less than 5 per cent of the land is cultivated, producing corn, oats, and hay. This soil must be thoroughly drained before it can be used for crops, and when drained it has about the same crop value as Scranton loamy sand and should be handled in much the same manner.

ST. LUCIE SAND

St. Lucie sand occurs in narrow, crescent-shaped areas around the margins of several bays northwest of Kingstree. The areas are characterized by a whitish sandy surface soil and an undulating or billowy relief. The surface soil consists of a 1-inch layer of white sand, mixed with roots, leaves, and some organic matter, over light-gray loose incoherent medium or coarse sand which changes at a depth of 4 or 5 inches below the surface to almost white medium sand. This grades at a depth ranging from 15 to 20 inches into white coarse sand which extends with little change to a depth of 15 or 20 feet below the surface. The soil is loose and incoherent throughout, and it contains little or no fine material. It is excessively leached and drained and is not suitable for farming.

The forest cover consists of scattered live oaks and many scrub oaks and other small, scrubby, thorny trees. The surface is covered with moss in some places and in others it is bare, and the sand is subject to shifting. The land is most suitable for forestry.

CAHABA FINE SANDY LOAM

Cahaba fine sandy loam occurs on bench lands bordering the larger streams, the largest bodies being about 5 miles east of Johnsonville on a terrace lying 10 or 15 feet above the river swamps. The surface soil in most places is brownish-gray fine sandy loam several inches deep. The upper subsoil layer is brick-red friable clay containing a low proportion of sand and some minute mica flakes. The clay is stiff and inclined to become hard on drying but has sufficient porosity to allow good moisture penetration. Below a depth ranging from 20 to 30 inches the proportion of silt, fine sand, and mica particles increases with depth, and 40 inches below the surface the material is sandy.

On the marginal slopes and some of the slight elevations the red clay layer has become exposed by surface wash. In places the original soil is shallow silty very fine sandy loam. In flat locations the soil gives way to gray sandy loam over tenacious mottled clay which is decidedly resistant to underdrainage.

Although deficient in organic matter, Cahaba fine sandy loam is easy to till, endures extremes of rainfall remarkably well, and produces good crop yields. It is suited to corn, oats, and forage crops, and the yields are profitably increased by the use of fertilizers and by the addition of organic matter.

KALMIA FINE SANDY LOAM

Kalmia fine sandy loam occupies tracts lying along river swamps and separated by sinuous extensions of the swamps. Along Black River near the Georgetown County line the general elevation is from 10 to 15 feet above the normal water level of the river. Farther up the river, the elevations become lower until on the upper reaches of the streams, near the Clarendon County line, the terraces are only 4 or 5 feet above the swamps.

The surface soil of Kalmia fine sandy loam consists of 3 or 4 inches of dark-gray fine sandy loam in which there is a moderately high content of organic matter. The subsurface soil is light-gray or yellowish-gray fine sandy loam containing very little humus and in places it may have a somewhat bleached appearance. Pale yellowish-gray or grayish-yellow loamy fine sand prevails to a depth of about 20 inches. This gives way to pale-yellow friable or slightly sticky fine sandy clay. In places the texture is medium sandy loam, and in other places, especially on the low terraces, faint red and gray mottles are present in the deep subsoil.

Most of this land is fairly well drained. Except on a few of the higher terraces, it is subject to overflow. Its agricultural value is similar to that of the Norfolk soils of corresponding texture. Only a few small areas are now used for crops, but the land affords fair pasturage.

KALMIA SAND

Areas of Kalmia sand form a part of the bench lands between Black River and the back swamps. The general elevation is from 5 to 10 or more feet above the adjoining swamps, and, locally, surface inequalities have a range of several feet. The relief, together with the sandy texture and openness, insure dry surface soil conditions.

The typical soil consists of several inches of brownish-gray sand over several feet of pale-yellow loose sand. In local depressions there is more organic matter in the surface layer, and, in places, slightly mottled yellow sandy clay occurs about 30 inches below the surface. On the low ridges the sand is coarser and deeper. In some places the surface soil is light-gray, bleached, medium or coarse sand, and loose yellow sand extends to a depth of several feet. Such areas support a growth of much scrubby oak and scattered large pines. In mapping this soil, areas of fine sand, loamy sand, and loamy fine sand, which are similar in color but differ slightly in texture, are included.

The agricultural value of Kalmia sand is less than that of Kalmia fine sandy loam. In general the land is subject to overflow at times of high water. It is utilized for pastures, and for this purpose it would produce better results if seeded to Lespedeza, Bermuda grass, or carpet grass. If the danger from overflow were eliminated, this soil could be used for early truck. It is most suitable for forestry.

LEAF VERY FINE SANDY LOAM

The most typical areas of Leaf very fine sandy loam occur in the extreme southeast corner of the county, on a terrace of uneven surface from 20 to 30 feet higher than the Santee River swamp to the south. The surface soil to a depth of 2 or 3 inches is grayish-brown

loam or fine sandy loam containing some organic matter in various stages of decomposition. The subsurface soil is commonly gray or brownish-gray material slightly heavier than the surface soil and inclined to be slightly sticky rather than friable under normal moisture conditions. On drying it becomes more friable and assumes an ash-gray color. At a depth of about 10 inches pale-yellow or grayish-yellow fine sandy clay is reached which grades, at a depth of about 20 inches, into light-gray stiff heavy tough clay more or less mottled with yellow, yellowish brown, and spots of rather bright red. Below a depth ranging from 30 to 40 inches the general color is more gray, and in places the proportion of sand and mica flakes is greater.

On a few slight elevations the very fine sandy surface layer is deeper, and the yellow subsurface layer is somewhat thicker, consequently moisture conditions are much improved. On the more pronounced inclines the surface layers vary greatly in thickness, and the upper part of the clay is usually distinctly red and somewhat granular. Some areas of fine sandy loam and very fine sandy loam have gray surface soils, grayish-yellow subsurface soils, and heavy tough mottled yellow, red, and gray subsoils. Along Black River, in the vicinity of Kingstree, areas of low terraces which have dark-gray or black surface soils occur. Along Black Mingo Creek from Nesmith to the Georgetown County line this soil has a loam texture.

The utilization of typical Leaf very fine sandy loam would require extensive ditching and careful cultivation to counteract the effect of the tight subsoil. The land is burned over for pasture, for which use it is best suited in its present drainage condition. Lespedeza, Bermuda grass, and carpet grass should furnish excellent pasturage.

JOHNSTON LOAM

Johnston loam occurs as swamp land, in long stretches from one-eighth to 1 mile in width, occupying overflow areas along most of the smaller streams in all parts of the county, principally along Black River and Black Mingo Creek.

This soil varies considerably in texture from place to place, owing to its derivation from different soils and to the deposition of the material under varying currents. The surface soil in most places is black, dark gray, or brown, high in organic matter, and in few places less than 10 or 12 inches thick. The subsoil is gray sticky sandy clay in which the texture of the sand varies from fine to coarse. Along the small streams in the northern part of the county the surface soil tends toward fine sandy loam, and along the streams in the southern part toward sandy loam.

A few areas, which are closely associated with the Leaf soils along Black River, have surface soils of dark-gray or almost black slightly compact and plastic medium-heavy clay loam, containing small rust-brown mottles in a few places. The subsoil is gray clay loam, mottled with drab, brown, and rust brown, and it is compact, plastic, and tenacious. At one time these areas were in rice fields.

The forest growth consists chiefly of cypress and black gum, together with a scattered stand of myrtle, sweetgum, birch, and willow. The underbrush is very dense and includes baybushes, laurel,

bamboo cane, and briers. In the Black River swamp typical pine growth is found on terraced islands lying only a few feet above the swamp and subject to overflow.

Johnston loam is used mainly as pasture land. Corn and rice are grown in small patches. Corn yields from 20 to 25 bushels to the acre and rice from 15 to 20 bushels. The cultivated fields are not very well supplied with artificial drainage, and in the few small patches where rice is grown, little or no attempt is being made to control the moisture supply.

If drained, this soil would produce good yields of corn and hay, but crops would be in constant danger of injury by inundation. Any effective system of drainage would have to include canals to drain the entire swamp, and economic conditions do not warrant this expense.

CONGAREE SILTY CLAY

The surface soil of Congaree silty clay along the stream edge of the bottom lands consists of brown silty clay or silty clay loam having a slight tinge of red and faint mottlings of gray. The subsoil, which occurs at a depth ranging from 8 to 12 inches, is mottled gray, drab, and brown silty clay. Neither surface soil nor subsoil is very compact, both are friable when dry and plastic when wet, and both contain a considerable quantity of small mica particles.

In the interior or interlake parts of the bottoms and back bottoms the brown surface soil is comparatively shallow and the subsoil strongly mottled. A few small islands standing several feet above the bottoms are deeply inundated and have a brown layer of deposited material on the surface and a mottled red and bluish-gray heavy subsoil. In the back bottoms of Santee River south of the entrance to Mount Hope Swamp are a number of old rice fields surrounded by ditches and dikes, and in these fields the soil differs somewhat from the remainder of the swamp. The surface soil consists of a 1-inch layer of brown silty clay over mottled yellow and brown silty clay which grades at a depth of 10 or 12 inches into bluish-gray tenacious clay. In places this clay lies close to the surface. Along the hill margin of the swamp, owing to outwash from local streams, the surface soil is dark gray or black and contains a considerable amount of organic matter and sandy soil material. These areas are similar in some respects to the Johnston soils, but they have the typical Congaree subsoil. In places along the river banks and extending back a short distance in intermittent strips. the soil is somewhat sandy, consisting of loamy fine sand near the channel and grading back into silty clay.

Congaree silty clay occupies the overflowed first bottoms along Santee and Pedee Rivers. It is most extensive in the broad bottom areas around Wee Tee Lake, from the Atlantic Coast Line Railroad trestle at Gourdin to Leneuds Ferry on the Georgetown County line. The bottom is traversed by numerous sloughs which in places broaden into lakes. As the soil occupies very low bottoms it is subject to deep and prolonged overflows which leave thin deposits of reddish-brown soil on the surface. The land is fairly level, and drainage is poor. The forest growth consists largely of cypress, with a scattered growth of gum, elm, sycamore, oak, ironwood,

hickory, ash, and pine. There is some underbrush in places but practically no grass.

Congaree silty clay has not been farmed for more than 100 years on account of floods. It is said to have produced heavy yields of rice, corn, and indigo during the period between 1754 and 1784. Many abandoned rice fields, ditches, and dikes are found. This is the most fertile soil in the county and, if reclaimed, would produce excellent yields of corn without the use of fertilizer.

RECOMMENDATIONS FOR THE IMPROVEMENT OF WILLIAMSBURG COUNTY SOILS

In the development of the soils of Williamsburg County for agricultural purposes, drainage of the extensive flat and almost level areas is of great importance. A large part of the Lenoir and Dunbar soils and all of the Coxville, Scranton, Portsmouth, Leaf, Johnston, and Congaree soils require artificial drainage before they can be successfully farmed. In most places, the subsoils of these soils, especially of the Lenoir, Coxville, Leaf, Congaree, and some of the Portsmouth soils, are sufficiently heavy and tough to enable the walls of the ditches or canals to stand up well, so that open ditches both small and large can be maintained at very slight expense. In many places on the Johnston, Congaree, and some other soils systems of canals will be necessary. Some of the best soils in the county for corn, grasses, and pasturage can not be used at present because of inadequate surface drainage, and almost every farm includes areas of soils that would be benefited by drainage. Much of the best-drained soil in the county would be improved were the flat bordering areas drained.

According to both field and laboratory tests, all the soils are acid to some degree. The well-drained members of the Ruston, Norfolk, Blanton, Marlboro, and Cuthbert series are only slightly acid; the poorly drained light-colored soils, such as the Coxville, Leaf, Lenoir, and some of the Dunbar, are more acid; and the poorly drained black or dark-gray soils show high acidity. Field experiments show that all the soils respond readily to the application of lime. Soils of the Coxville, Lenoir, and Portsmouth series need a larger quantity of lime to the acre than the other soils in the county. The light-colored soils containing a small amount of organic matter are less acid than the poorly drained black lands.

All the light-colored soils, especially those which have been under clean cultivation for a long time, are very low in organic matter. The surface soils of the Portsmouth and some of the Coxville soils contain a high proportion of vegetable matter. The well-drained sandy loams, which are the best agricultural soils, have been under cultivation for the longest time, and, except where rotation of crops has been practiced and leguminous crops turned under, they contain a very small amount of organic matter. In this county there is not sufficient manure produced to provide organic matter required by the soil. Leguminous crops such as velvetbeans, vetch, cowpeas and Austrian winter peas should be grown and turned under. After the soil has been highly charged with organic matter, more concentrated or higher-grade fertilizers can be used profitably. If a large

amount of the green crops is turned under at one time, the addition of a small amount of lime at some later time may be necessary.

Although most of the soils are low in soluble plant foods, they possess physical characteristics that respond readily to fertilizer and manures, and they produce profitable crops. All the well-drained flat soils, particularly those of the Norfolk, Ruston, Blanton, Marlboro, and Cuthbert series, are very easy to cultivate. Their texture and structure, together with their smooth surface relief, allow the use of modern farm machinery. These soils are also very easy to cultivate with hand tools where such crops as cotton, tobacco, and truck are grown. The sandy loams of the Norfolk, Ruston, and Marlboro series give the best returns in normal seasons, whereas the more sandy soils produce the best yields in ordinarily dry seasons. There is very little difference in the kind of fertilizer used on the various types of soil, but there is a difference in the amount applied to certain crops. The Williamson method of growing corn, details of which may be obtained from the county agent, is practiced by a large number of farmers.

The sandy loams of the Norfolk, Ruston, Marlboro, and Cuthbert series in other sections of the Atlantic coastal plain are considered the best soils in their respective localities for the production of bright tobacco, peanuts, and cotton as staple cash crops and also for the production of a wide variety of truck crops. The Coxville and Portsmouth soils are used extensively in some sections for the growing of strawberries and other crops, as well as for the production of corn. The Coxville, Lenoir, Portsmouth, Leaf, and Congaree soils provide the best pasturage.

Practically all the original growth of longleaf pine has been cut, and much of the area has reforested itself to old-field pine, loblolly pine, and a variety of oaks. The sandy loams of the Norfolk, Ruston, Marlboro, Cuthbert, and Blanton series support a growth of longleaf, shortleaf, and loblolly pines, together with a scattered growth of white, post, and live oaks, hickory, dogwood, some persimmon, wild cherry, and myrtle. The more sandy soils of these series support about the same pine growth as the sandy loams, but there are more of the turkey oak, scrub oak, sassafras, and old-field pine. On most of the Lenoir and Coxville soils and on some of the best drained areas of the Portsmouth soils, pines and scattered hardwoods predominate. The more poorly drained Portsmouth and Coxville soils, together with soils of the Leaf, Johnston, and Congaree series, have a considerable quantity of sweetgum, black gum, some cypress, bay, myrtle, and gall berry, in addition to a few pines. Broom sedge is a common plant on many of these soils, especially where the tree growth is scattered. The deep sands and some of the poorly drained Coxville soils, some of the Portsmouth soils, the Plummer soils, St. Lucie sand, and much of the first-bottom soils, should remain in forest or be reforested. These are marginal or submarginal lands and under present economic conditions the returns from farming such soils are not profitable.

Williamsburg County offers opportunities to the home seeker and farmer in the abundance of good cheap land and favorable climatic conditions. The warm climate and long growing season make possible the production of a large variety of crops.

SOILS AND THEIR INTERPRETATION

Williamsburg County is wholly within the Atlantic coastal-plain region, and most of it is in what is known as the flatwoods or seaward part of the coastal plain. The county comprises gently rolling, undulating, and extensive flat or nearly level poorly drained areas. The climate is essentially oceanic, being marked by warm temperatures, little freezing, heavy rainfall, and abundant sunshine. The heavy rainfall and warm temperatures favor rapid leaching of the soluble soil constituents. This leaching of the alkalies and alkaline earths probably accounts for the fact that the surface soils do not contain so high a proportion of mineral plant food as the subsoils. Soil acidity tests show that the soils of the county vary from slightly acid to very acid.

From the viewpoint of drainage and soil development there are three main groups of soils in Williamsburg County. First, the well-drained soils of the Norfolk group which includes all the soils of the Norfolk, Ruston, Marlboro, Cuthbert, and Blanton series; second, the light-colored, poorly drained soils embracing all the members of the Coxville, Dunbar, and Lenoir series; and third, the poorly drained, dark-gray or black soils.

The soils have been developed under forest cover which has not favored the accumulation of organic matter. In the virgin areas a slight accumulation of coarse, partly decomposed vegetable matter is present at a depth ranging from 1 to 3 inches, but this has not become incorporated with the soil as has the vegetable matter in the grass-covered regions of the Central States. All the soils of the Norfolk and Dunbar series are dominantly light gray or grayish yellow in the surface soil and contain small amounts of organic matter. The dark-gray or black color of the Plummer, Scranton, and Portsmouth soils is caused by the large amount of organic matter which has accumulated under semiswampy conditions.

The parent soil-forming material consists of unconsolidated beds of sands and clays in which no uniformity in color, texture, or structure exists. The normal substratum, or partly weathered parent material, of the region is mottled yellow, gray, and red, with shades of these colors.

The amount of arenaceous and clayey material varies considerably in different parts of the county. In a belt averaging between 5 and 6 miles in width, extending in a general northeast and southwest direction across the county, lying north of a line from the Clarendon County line northwest of Greelyville to Kingstree, swinging north around the head of White Oak Swamp to Cooper Crossroads, thence east to Ards Crossroads, and down to Outland on the Georgetown County line, and also in a small area around Salters, the substratum or parent material is more siliceous, containing less clayey material than in the rest of the county. Southeast of a line from near Rome to Earle, thence to the Santee River bluff 4 miles southeast of Gourdin, the substratum is generally heavy and contains a comparatively high proportion of clay and less sand. Underlying the remainder of the area, the normal substratum occurs, in which is a medium amount of siliceous material and clay. In places, the partly consolidated bedrock lies from 6 to 15 feet below the surface and consists of alternate layers of

arenaceous shale, clay shale, carbonaceous shale, and sandstone, varying from almost pure quartz to highly ferruginous material and marl. Marl and phosphate beds underlie some of the county, as is evidenced by the outcrops and sink holes, but there is little evidence to support the theory that any of the soils are derived directly from calcareous or phosphatic formations. If any of the soils have been derived from marl, the weathering agencies have removed the carbonates and phosphates.

Topography, drainage, oxidation, and aeration are the principal factors operating on the parent material, which influence the character and distribution of the soils. There are extensive flat areas in the county which maintained their constructional form as the land was raised from the sea. Such areas have not been invaded by natural drainage, and aeration and oxidation have been retarded. Only in the well-drained parts of the county do the normally developed soils of the region occur.

The soils included in the Norfolk group are the normally developed soils of the county, and these differ in degree of maturity owing to position, drainage, and in places to the character of the parent material. The Ruston and Cuthbert soils occupy better-drained and better-aerated areas than the other soils. The Cuthbert soils are derived from heavy clayey materials. The Ruston soils probably contained more iron than the other soils originally or, at any rate, there is a greater amount of oxidation at present. The Marlboro soils have probably developed from slightly heavier material than the Norfolk soils or have suffered less from eluviation. The Norfolk and Blanton soils show a greater amount of leaching than any other soils.

The most striking feature of the texture profile of the well-developed or normal soils of the county is the presence of a comparatively light-textured surface soil overlying a subsoil of heavier material, which in turn is underlain by a layer which may vary considerably in texture but which is prevailingly lighter than the subsoil and heavier than the surface soil. In the normally developed soils, such as those of the Norfolk, Marlboro, Blanton, Cuthbert, and Ruston series, the surface soils are typically very light textured, consisting of sand or light sandy loam. A moderately wide difference exists in the texture of the surface soils and the comparatively heavier layer or typical subsoil. The subsoil, or B horizon, is the heaviest layer in the soil profile. It is the seat of moisture and contains more plant food than the surface soil.

In the Coxville and Portsmouth groups of soils there is no normally developed soil profile. The surface soil grades into the subsoil, and the subsoil is not uniform in color, texture, or structure. This condition is due to imperfect drainage and to incomplete oxidation of the iron salts. The alternate wetting and drying of these soils probably accounts for the light color in the surface soils and for the mottled or blotched appearance of the subsoils, especially in the Coxville soils. The Plummer, Scranton, and Portsmouth soils contain large amounts of organic matter and are dark gray or black in their surface soils and light gray usually mottled with rust brown in their subsoils.

The terraces along the main streams were formed and existed under similar conditions to the upland soils. They have lain at positions of

nonoverflow or occasional overflow for a sufficient length of time to develop, in places, a normal soil profile. Much of this land has been cleared and ditched, and in recent years large drainage canals have been built so that the drainage is much improved. The Kalmia, Cahaba, and Leaf soils represent the terrace soils in the county. The Kalmia and Cahaba soils have, in most places, developed a normal soil profile and correspond in color and texture to the Norfolk and Ruston soils, respectively, and the Leaf soils are similar in their characteristics to the Coxville soils of the upland.

The first-bottom soils along the streams, with the exception of the large bottoms of the Santee and Peedee Rivers, occur as low swampy areas in which the streams spread out over the swamp with no well-defined channels. Their position favors the accumulation of organic matter, and most of them have a deep organic surface soil underlain by a gray or mottled brown and bluish subsoil. The mineral material along the smaller streams is generally sandier than along the larger streams where the finer sediments are deposited. Soils of the Congaree and Johnston series occur in the first bottoms. The Congaree soils consist of material washed from the piedmont-plateau region of the State and deposited by the streams, and the Johnston soils include the alluvial deposits or materials washed from the coastal-plain soils.

In Table 6 the pH values of several of the soils of Williamsburg County are given.

TABLE 6.—*pH determinations of soils in Williamsburg County, S. C.*

[1 : 1 soil-water ratio]

Sample No.	Soil type	Depth	pH value	Sample No.	Soil type	Depth	pH value
		Inches				*Inches*	
243759	Norfolk sandy loam.	0 to 6	5.29	243723X	Dunbar fine sandy loam.	2 to 6	5.67
243760	do	6 to 10	5 19	243724X	do	6 to 12	5 47
243761	do	10 to 18	5 03	243725X	do	12 to 18	4 75
243762	do	18 to 30	5.00	243726X	do	18 to 24	4.65
243763	do	30 to 42	5.00	243727X	do	24 to 30	[1] 4 59
243764	do	42 to 60	5 03	243728X	do	30 to 36	[1] 4.65
2437207	Coxville loam	0 to 1	4.73	243729X	do	36 to 42	4.45
2437208	do	1 to 5	4 59	243743	Ruston sandy loam.	0 to 8	5.19
2437209	do	5 to 15	4 62				
2437210	do	15 to 24	4 62	243744	do	8 to 14	5 50
2437211	do	24 to 36	4.67	247345	do	14 to 20	5.50
243722X	Dunbar fine sandy loam.	0 to 2	5.32	243746	do	20 to 30	5.75
				243747	do	30 to 36	[1] 4 59

[1] 1:2 soil-water ratio.

SUMMARY

Williamsburg County is in the eastern part of South Carolina. The soil map includes (with 44 square miles of Florence County) an area of 981 square miles. The relief ranges from flat to gently undulating. Along the streams are broad swamps bordered by well-drained strips of undulating land which merge into the interior flats. Within these flats are numerous depressions and bays in which streams head.

This part of the State was settled by the Scotch about 1732, and was organized as a county in 1785. In 1920 the density of the popu-

lation, all of which was classed as rural, was 41.6 persons to the square mile. Kingstree is the largest town. Surplus crops and livestock are sold on local markets and shipped to Charleston and to markets farther north. Two main railroad lines pass through the county.

The climate is oceanic, marked by mild winters, hot summers, and heavy precipitation.

Farm land occupies 57.4 per cent of the total area of the county. Of this amount, 44 per cent is improved. Corn, cotton, hay, tobacco, and oats are the principal crops. Cotton was the chief money crop up to 1910 when tobacco growing started on a commercial scale. With the advent of the boll weevil in 1922, tobacco became the leading money crop, supplemented by truck crops, hogs, and poultry. The surface relief of the soils determines somewhat the distribution of the crops, but the farmers do not follow soil adaptations closely. The farm equipment is fairly good. The cultural methods vary but slightly. Corn is grown on the Williamson plan and modifications of that plan, and practically all crops are planted in deep furrows on the sandy soils and in shallower furrows or on level beds on the heavier, lower-lying, or poorly drained soils.

Most of the farmers use commercial fertilizer, mainly of complete grades. About one-third of the farmers employ labor which is plentiful and may be obtained at a reasonable price. Tenants operate 60.5 per cent of the farms. The average size of farms was 57.1 acres in 1920, and the average value of farm land was $43.52 an acre.

In Williamsburg County 17 soil series are represented by 36 soil types and 3 phases of types. The soils range from coarse to very fine sands, and from fine sandy loams to clay loams. Twenty-five per cent of the soils are well drained, 40 per cent are imperfectly drained, and 35 per cent are poorly drained.

Of the well-drained soils those of the Norfolk series have the widest distribution and are the most important. They are excellent for general farming, tobacco, and early truck crops.

The Ruston soils are the best all-around farming soils in the county, except for tobacco. The Cuthbert soils are well suited to cotton and small grains. The Marlboro soils are particularly strong and especially suited to cotton, corn, oats, and truck crops, but are only fair for tobacco. The Dunbar soils are strong and well suited to cotton and oats.

The other soils of the county are less important under prevailing agricultural conditions, but many of them have a potential value which may be realized under future development, especially with improved drainage.

[PUBLIC RESOLUTION No. 9]

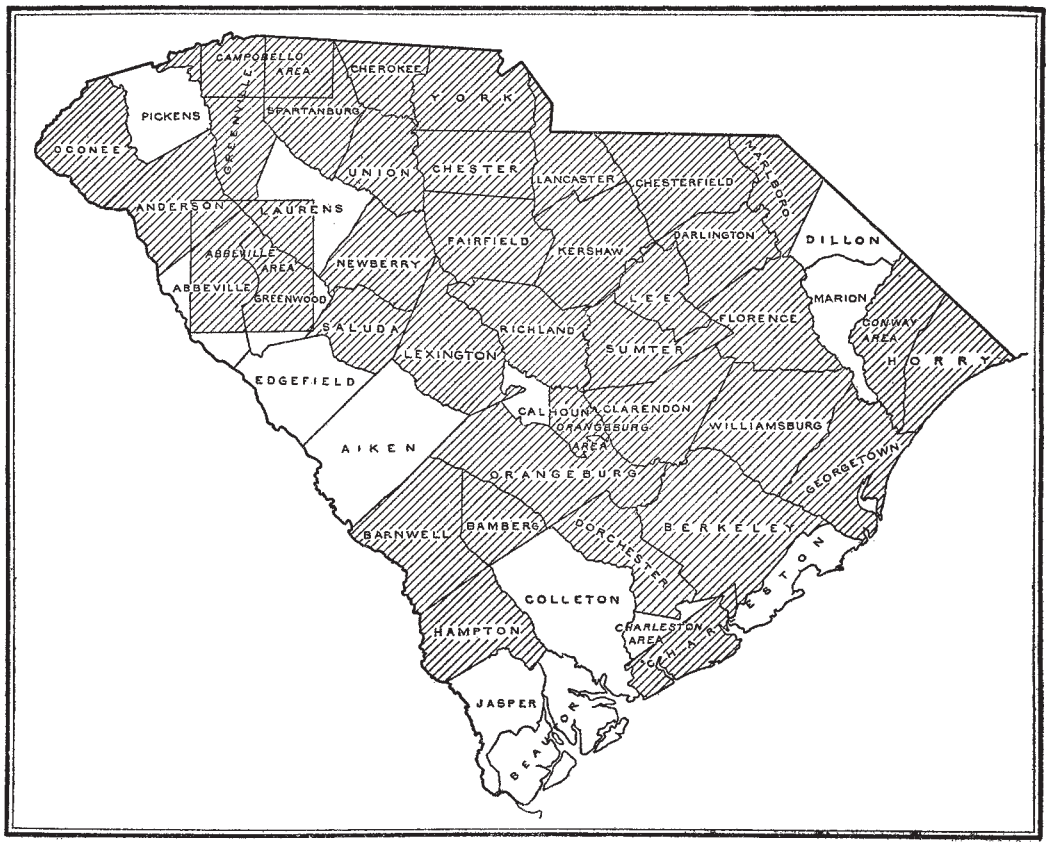
JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

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, and on July 1, 1927, the Bureau of Soils became a unit of the Bureau of Chemistry and Soils.]



Areas surveyed in South Carolina, shown by shading

U. S. GOVERNMENT PRINTING OFFICE: 1929

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