U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

IN COOPERATION WITH THE NORTH CAROLINA DEPARTMENT OF AGRICULTURE,
W. A. GRAHAM, COMMISSIONER; B. W. KILGORE, STATE CHEMIST AND
DIRECTOR OF AGRICULTURAL EXPERIMENT STATION;
C. B. WILLIAMS, AGRONOMIST.

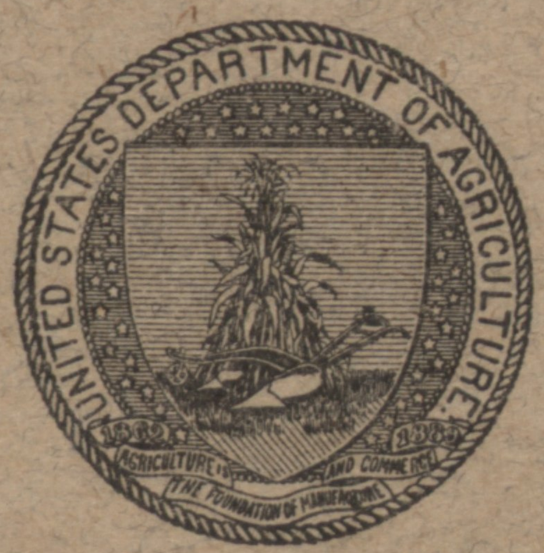
SOIL SURVEY OF HALIFAX COUNTY, NORTH CAROLINA.

BY

R. B. HARDISON, OF THE U. S. DEPARTMENT OF AGRICULTURE,
IN CHARGE, AND L. L. BRINKLEY, OF THE NORTH
CAROLINA DEPARTMENT OF AGRICULTURE.

W. EDWARD HEARN, INSPECTOR, SOUTHERN DIVISION.

[Advance Sheets—Field Operations of the Bureau of Soils, 1916.]



WASHINGTON:
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1918.

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., December 11, 1917.

SIR: I have the honor to transmit herewith the manuscript report and map covering the survey of Halifax County, North Carolina, and to request that they be published as advance sheets of the field operations of the Bureau of Soils, 1916, as authorized by law.

The selection of this area was made after conference with the State officials cooperating with the bureau in the work of surveying and classifying the soils of North Carolina.

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

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

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FIGURE.

FIG. 1. Sketch map showing location of the Halifax County area, North Carolina 5

MAP.

Soil map, Halifax County sheet, North Carolina.

SOIL SURVEY OF HALIFAX COUNTY, NORTH CAROLINA.

By R. B. HARDISON, of the U. S. Department of Agriculture, In Charge, and L. L. BRINKLEY, of the North Carolina Department of Agriculture.—Area Inspected by W. EDWARD HEARN.

DESCRIPTION OF THE AREA.

Halifax County is situated in the northeastern part of North Carolina. Halifax, the county seat, is 70 miles northeast of Raleigh, 90 miles south of Richmond, and 85 miles southwest of Norfolk. The county is bounded on the north and east by the Roanoke River, which separates it from Northampton and Bertie Counties; on the south by Nash and Edgecombe Counties, from which it is separated by Fishing Creek, and Martin County; and on the west by Warren County. It is very irregular in outline. It has an area of 711 square miles, or 455,040 acres.

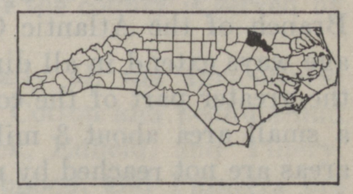


FIG. 1—Sketch map showing location of the Halifax County area, North Carolina.

Halifax County lies partly in the Piedmont Plateau and partly in the Coastal Plain, and the surface configuration varies considerably in different localities. West of a line drawn from Battles Bridge, on Fishing Creek, to Bolling the surface is prevailingly rolling, steeply rolling, and hilly, with intervening smaller areas of undulating to gently rolling country. To the east or southeast the topography becomes less broken, and in the vicinity of Enfield and Scotland Neck and throughout the southern end of the county the surface is prevailingly flat to undulating, with gentle slopes toward the bottom lands.

Many of the streams have cut deep ravines, some of the valleys lying 50 to 75 feet below the general upland level. The valleys are deepest near Roanoke River. In the Piedmont section of the county the valleys are all deep, and in most places are flanked by well-rounded hills. In the vicinity of Enfield and throughout the southeastern part of the county the valleys are broader and flatter, and the streams more sluggish.

A noticeable feature of the topography is the extensive development of stream terraces. The largest of these terraces, 2 to 5 miles in width, extends along the Roanoke River from Weldon to the ex-

treme southeastern corner of the county. The terrace along Fishing Creek ranges in width from a fraction of a mile to 2 miles. Narrower strips of terrace occur along the larger creeks. The terrace along the Roanoke River consists of a series of flat strips rising steplike from the river, or of alternating low ridges and depressions running more or less parallel to the river. In places the topography of the terraces along Fishing Creek is similar to that of the river terraces, but in general the terrace areas along this stream and the other creeks are nearly level, there being only a gentle slope toward the stream and in the direction of flow.

The general slope of the county is toward the southeast. According to records of the Atlantic Coast Line Railroad, Hobgood is 88 feet above sea level, Palmyra 95 feet, Weldon 77 feet, Halifax 101 feet, and Enfield 99 feet. Points in the western part of the county probably reach an elevation of 400 or 500 feet.[1]

Halifax County is drained through the Roanoke River and Fishing Creek. The divide between these streams enters the county near Littleton and passes in a general southeasterly direction to Pender, whence it continues along the county highway to Crowells Crossroads, thence to Spring Hill, and along the Kinston-Weldon Branch of the Atlantic Coast Line Railroad to Hobgood. Drainage ways extend in all directions from the larger streams, and reach the greater part of the county. The so-called "Meadows," which is a small area about 3 miles south of Hollister, and several terrace areas are not reached by natural drainage ways. The largest poorly drained terrace area is the so-called "Slashes," about 4 miles southeast of Halifax.

The Roanoke River is a swiftly flowing stream, and near Roanoke Rapids considerable water power has been developed. Below Halifax the river appears to have cut down nearly to base level, and the current is much slower. A few gristmills are operated on the smaller streams.

Halifax County was formed from Edgecombe County in 1758. The early settlers came mainly from the British Isles. Many of them settled first in New Jersey and other northern States and then migrated to this county. Others came directly to Halifax County. The white population consists mainly of descendants of the early settlers. About 35 per cent of the population consists of white persons, and 65 per cent of negroes. The population of Halifax County in 1910 is reported as 37,646. It is all classed as rural, and averages 55.7 persons per square mile. Settlement is sparsest in broad areas along the Roanoke River from Halifax to the southeastern corner of

[1] See Vol. III, N. C. Geological and Economic Survey, The Coastal Plain of North Carolina, p. 410.

the county, and along Fishing Creek. Some localities in the southwestern part of the county also are sparsely settled. Settlement is comparatively dense around Weldon, Roanoke Rapids, and Scotland Neck. The largest towns in the county and their populations in 1910 are reported by the census as follows: Weldon, 1,999; Scotland Neck, 1,726; Roanoke Rapids, 1,670; Enfield, 1,167; and Littleton, 1,152.

The central part of Halifax County is traversed from north to south by the main line of the Atlantic Coast Line Railroad from Richmond to Jacksonville. The Kinston-Weldon Branch of the same system extends southeasterly across the eastern half of the county, making connections at Hobgood with the Norfolk Branch, which crosses the county near the southeastern boundary. The northern part of the county is served by the Raleigh-Portsmouth Branch of the Seaboard Air Line Railway.

The main highways of Halifax County are in good condition, and the others are gradually being improved. Good roads branch out from Halifax to Weldon, Littleton, Scotland Neck, Enfield, and Roanoke Rapids. An improved road connects Littleton, Ringwood, and Enfield, and another extends from Ringwood to Rocky Mount in Edgecombe County. The greater part of the county is served by telephone lines.

With the exception of tobacco, practically all the agricultural products are marketed within the county. Cotton and peanuts find a ready market in Weldon, Scotland Neck, Enfield, and Tillery. Littleton, Roanoke Rapids, Rosemary, Hobgood, and Palmyra are good cotton markets. Tobacco is sold in Rocky Mount, Edgecombe County, and Warrenton, in Warren County. At Scotland Neck, Enfield, and Weldon there are factories for hulling and grading peanuts, and from these points shelled nuts are shipped to all sections of the country. Potatoes, fruits, and vegetables are disposed of in the local towns.

CLIMATE.

The climate of Halifax County is well suited to the production of a wide range of general farm crops and late truck and to stock farming. The winters are short and comparatively mild, and the summers are long but not excessively hot. The annual rainfall ranges between 30.18 inches and 59.58 inches, the mean being 47.22 inches. The rainfall is heaviest during the summer months and lightest during the fall months, or the harvesting season. Crops rarely suffer from drought. The lowest temperature recorded is —9° F., and the highest 107° F. The mean annual temperature is 58.9° F.

The earliest recorded killing frost in the fall occurred on October 10, and the latest in the spring, on May 11. The average date of the

first killing frost in the fall is October 24 and that of the last in the spring April 12. This gives a normal growing season of 195 days, which is long enough for all ordinary crops.

The table below shows the more important climatic data as compiled from the records of the Weather Bureau station at Weldon:

Normal monthly, seasonal, and annual temperature and precipitation at Weldon.

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.
	°F.	°F.	°F.	Inches.	Inches.	Inches.
December	40.8	77	− 5	3.53	2.61	1.70
January	39.4	80	− 9	3.53	4.58	3.80
February	41.1	81	− 3	3.74	1.81	4.86
Winter	40.4	81	− 9	10.80	9.00	10.36
March	48.5	96	10	4.12	1.65	8.30
April	57.3	94	27	3.41	3.22	3.34
May	68.1	100	34	4.31	2.30	9.34
Spring	58.0	100	10	11.84	7.17	20.98
June	75.6	103	44	4.10	1.40	4.13
July	79.4	107	52	5.40	3.94	5.78
August	77.2	107	49	5.45	5.12	8.79
Summer	77.4	107	44	14.95	10.46	18.70
September	71.4	98	36	3.74	2.13	1.3[illegible]
October	59.3	95	27	3.44	1.01	6.10
November	48.5	83	15	2.45	0.41	2.07
Fall	59.7	98	15	9.63	3.55	9.54
Year	58.9	107	− 9	47.22	30.18	59.58

AGRICULTURE.

The first settlements in Halifax County were apparently made near the watercourses. The first crops grown were corn, peas, potatoes, flax, and various vegetables. Live stock was brought in at an early date, and gradually increased in number. Flax was spun and woven into garments for home use. Considerable wool was produced and made into clothing at home. Tanneries were in operation at an early date, and furnished leather for making shoes. Nearly every settler grew tobacco for domestic use. Cotton was grown in small patches and made into homespun garments, the lint being separated from the seed by hand.

In 1849 the county produced 2,905,573 pounds of cotton, 15,750 pounds of wool, 669,325 bushels of corn, 147,216 pounds of tobacco, 11,230 bushels of wheat, and 72,032 bushels of oats. Turpentining

was of considerable importance about this time, 4,886 barrels of turpentine being produced in 1849. The population of the county in 1850 was 16,589. Between 1850 and 1880 there was a decided decrease in the production of corn and an increase in the production of cotton. In 1879 there were 437,321 bushels of corn produced, 16,661 bales of cotton, 41,771 bushels of oats, 9,235 bushels of wheat, and 8,487 pounds of tobacco. The area in sweet potatoes in that year was 543 acres and the production 52,709 bushels. From 424 acres in hay 357 tons were produced.

Bright yellow tobacco was first grown on a commercial scale about 32 years ago. In 1889 there were 274 acres in this crop, with a production of 93,714 pounds. By 1899 the area had increased to 3,522 acres and the production to 2,441,200 pounds. In 1899 the production of corn was 550,600 bushels, of cotton 16,643 bales, and of peanuts 369,805 bushels.

At the present time the agriculture of Halifax County consists mainly of the production of cotton, corn, and peanuts as the principal crops, with grain forage, tobacco, cowpeas, and sweet potatoes and other vegetables as crops of secondary importance.

Cotton is the most important crop. It is grown in all sections of the county. In 1909 there were 45,531 acres in cotton, with a production of 23,412 bales, or an average of 0.51 bale per acre. All the cotton produced is sold on the local markets, and a considerable part of the crop is manufactured at Roanoke Rapids, Rosemary, Scotland Neck, Enfield, Weldon, and Halifax.

In 1909 corn ranked next to cotton in importance, but since that year the production of peanuts has greatly increased, and it is probable that peanuts are now the crop of second importance. In 1909 there were 28,374 acres planted to peanuts. The total production was 674,087 bushels, or an average of 23.7 bushels per acre. Peanuts are used to some extent for subsistence, but the greater part of the crop is sold on the local markets, and either disposed of to dealers in Norfolk, Portsmouth, or Petersburg, or handled by mills within the county. A few of the most extensive growers ship directly to outside markets. Near Scotland Neck, Tillery, Hobgood, Palmyra, Norfleet, and Enfield peanuts are grown not only as a money crop but also for feeding hogs. The greater part of the crop grown for hog feeding is of the Virginia variety. When the vines are properly cured they make excellent hay.

The most important subsistence crop of the county is corn. This crop occupied 41,986 acres in 1909, and produced 426,765 bushels. Sufficient corn is not produced in the county to supply the local demand, and large quantities are shipped in each year. The corn is used to feed work stock and hogs and also ground for domestic use.

Throughout the county a considerable area is seeded to grains to be cut green. The area in grains cut green in 1909 was 1,742 acres, and the production 1,581 tons. The production has increased greatly since that year. There were 448 acres in tame grasses in 1909, from which 675 tons were harvested. In the vicinity of Scotland Neck and other larger towns a considerable proportion of the hay crop is baled and put on sale at the local markets. Not enough hay and forage is produced within the county to supply the local needs, and large quantities are annually shipped in from outside points. In 1916 there were 30 acres of alfalfa on the State Prison Farm, and a few acres elsewhere in the county.

Of the money crops tobacco is third in importance. Tobacco is grown near Scotland Neck, Littleton, Enfield, Halifax, Airlie, Hollister, and Ringwood. There are no warehouses in the county, and all the crop is sold in Rocky Mount and Warrenton. The census reports 1,560 acres in tobacco in 1909, producing 924,435 pounds.

In 1909 there were 1,622 acres seeded to cowpeas, from which there were harvested 5,131 bushels of seed. Cowpeas are grown to some extent for soil improvement.

Sweet potatoes and other vegetables are grown principally for home consumption, the surplus being sold on the local markets. In 1909 there were 1,215 acres in sweet potatoes, with a production of 122,454 bushels. In the same year there were 1,108 acres planted to other vegetables.

Oats are grown to a small extent. The census reports 716 acres in this crop in 1909, with a production of 8,794 bushels. In the same year there were 223 acres in wheat, with a production of 2,515 bushels. The acreage of wheat has increased considerably since 1909, there being 300 acres in this crop on the State Prison Farm alone in 1916. Wheat is grown principally near Littleton, Brinkleyville, Ringwood, and Hollister. Oats are grown for seed, for feed, and for grazing hogs. Wheat is grown as a subsistence crop. A considerable area is seeded to rape, clover, and rye for hog pasturage. Crimson clover is grown to some extent in nearly all parts of the county as a soil-improving crop. In some places on the terrace soils bur clover is used for pasturing cattle.

Sorghum is grown in small fields throughout the county. Part of the crop is made into sirup for home use, and the remainder is cut at maturity and fed to hogs.

Strawberries, blackberries, and dewberries are grown on some farms. There are small orchards of summer apples, peaches, pears, and plums throughout the county. Grapes, including the Scuppernong, Mish, James, Thomas, and Concord varieties, do well in all sections. At Medoc there is a vineyard of several hundred acres set to Scuppernong, Mish, and James grapes.

Hogs are raised in all parts of the county. Near Scotland Neck and Halifax some farmers raise 50 to 300 each year. The fattened hogs are shipped in carload lots to Norfolk, Richmond, and other markets. In some instances they are slaughtered and shipped in less than carload lots. There were 10,929 hogs sold or slaughtered in 1909. Nearly every farmer raises at least 3 to 10 hogs each year to supply meat and lard for the home and a small surplus of pork for sale on the local markets.

In 1909 there were 192 calves and 1,226 other cattle sold or slaughtered on farms. In the southeastern part of the county and near Weldon there are a few herds of purebred cattle, consisting of Herefords, Shorthorns, and Black Angus. The herds range in number from about 60 to 200. Some farmers buy up scrub cows, graze them during the spring and summer months, and sell them on the local markets in the fall or winter. Feeding and fattening cattle for outside markets is not carried on extensively.

Dairying is engaged in to a small extent near Weldon, Roanoke Rapids, Enfield, and Littleton. Practically every farmer keeps one to five cows to furnish milk and butter for home use and an occasional surplus for sale locally. Approximately $33,500 worth of dairy products were produced in 1909.

Only a small number of colts are raised in Halifax County. A large number of mules and horses are shipped in each year.

In a general way the farmers recognize the adaptation of the various soils to the different crops. In the eastern part of the county, or the Coastal Plain section, the deep phase of the Norfolk fine sandy loam is considered best for tobacco, and the greater part of the crop is grown on this soil. The Durham sandy loam and Appling sandy loam of the Piedmont section are held in high esteem for tobacco, and a large percentage of these types is devoted to that crop. The Norfolk sandy loam, Norfolk fine sandy loam, and Wickham fine sandy loam are recognized as the best soils in the county for cotton and peanuts, and they are extensively used for these crops. The Orangeburg sandy loam, Ruston sandy loam, and Ruston fine sandy loam also are considered good soils for cotton and peanuts. The Congaree fine sandy loam and silty clay loam are particularly well adapted to corn, and they are used for this crop almost exclusively. The Wickham very fine sandy loam is known to be adapted to wheat.

On the best farms the barns are large enough to shelter a number of horses, and some of them have a loft to store hay and feed. There are only a few cattle barns and silos in the county. The most successful farms in all sections are equipped with mowing machines, one and two horse turning plows, disk plows, riding and walking cultivators, disk harrows, cutaway harrows, lime spreaders, and manure spreaders. A few of the more extensive farmers use power

tractors and thrashing machines. Gins are operated on practically all the larger cotton farms. Peanut thrashers are owned by some of the growers, and thrashers drawn by tractors travel about the county as soon as the peanut-harvesting season opens. Tobacco transplanters are used in most communities where tobacco is grown. Cotton, corn, and peanut planters, fertilizer distributors, and hay balers are in general use throughout the county. Corn shredders have been introduced, but they are not in common use. The work stock consists mainly of mules. Horses are also used, particularly on the upland farms.

Crop rotations are practiced to some extent in all parts of the county. One of the most popular rotations consists of cotton followed by peanuts, with a cover crop of rye, oats, or clover sown in the fall, and cotton, corn, or tobacco grown the third year. Where tobacco is to follow peanuts the winter cover crop is left out. Around Enfield peanuts, cotton, and corn are commonly grown in rotation. In the Piedmont section of the county, around Hollister, a satisfactory rotation consists of cotton, with clover sown in the middles, the first year; corn the second year; and wheat, followed by cowpeas, the third year. In the vicinity of Ringwood one of the most successful rotations is made up of cotton, corn, or peanuts, and tobacco. Around Airlie cotton is often alternated with corn, cowpeas being sown broadcast in the corn at the last cultivation. Another rotation practiced to some extent in this neighborhood consists of corn the first year; wheat the second year, followed by cowpeas in June and clover in the fall; and either cotton or corn the third year. On some farms near Airlie cotton is followed by peanuts, with tobacco grown the third year and clover seeded as soon as the tobacco is harvested. The fourth year the land is put in corn. One of the best rotations in use around Littleton consists of tobacco the first year, followed by clover in the fall; corn the second year; and peanuts the third year.

Commercial fertilizers are extensively used in Halifax County. The total expenditure in 1909 for fertilizer amounted to $288,329. The fertilizers are used in growing the more important crops except peanuts. Before the European War shut off the supply of potash, complete mixtures were generally applied. These varied widely in composition, but were usually of good grades. Applications also were comparatively heavy for all crops, corn receiving less than cotton or tobacco. At present mixtures carrying phosphoric acid and nitrogen, or in some instances phosphoric acid alone, are used, the latter especially where a leguminous crop last occupied the land. On some farms nitrate of soda is used as a top-dressing. Some form of lime is generally applied to land to be planted to peanuts.

The farm labor of Halifax County is mainly colored. In the southeastern part of the county labor is abundant, but comparatively

unskilled. In the central and western parts labor is usually scarce. Day laborers receive 75 cents to $1 for ordinary farm work. When hired by the month they receive $15 to $20, with board, house, and firewood in some cases. For hoeing cotton, peanuts, and tobacco, negro women receive 50 to 75 cents a day. Cotton pickers are paid 40 cents to $1 per hundred pounds, the higher wages prevailing near the close of the season. In 1909, according to the census, 1,880 farms in Halifax County used hired labor, at a total expenditure of $382,429, or approximately $203 for each farm.

Land holdings in Halifax County range in size from a few acres to 5,000 or 6,000 acres. Only a small percentage of the larger holdings usually is in farms. The average size of farms is reported by the 1910 census as 81.9 acres.[1]

The percentage of farms operated by owners in 1910 is reported as 35.1. Tenants operated 64.2 per cent of all the farms, and managers 0.7 per cent. Over 67 per cent of the tenanted farms are rented for cash. Usually where the farm is rented on a share basis the landlord furnishes everything needed except the labor and one-half the fertilizer, and receives one-half of all crops produced. Near Littleton tenants furnish teams, implements, and labor, while the landlord furnishes the land and all the fertilizer, each taking one-half the crops produced. Some farms of about 25 acres near Airlie are rented for 1,500 to 2,000 pounds of seed cotton. Many upland farmers rent land of the Congaree silty clay loam along the Roanoke River on which to grow corn, paying $5 an acre annual rent.

There is a wide range in land values in Halifax County, the price depending largely upon the improvements and the proximity to towns and railroads. In general, prices range from $5 to $100 an acre. The cheapest lands are in the western part of the county, near Essex and Hollister, where land can be bought for $5 to $30 an acre. Around Ringwood land is held at $10 to $50 an acre. Near Airlie the price ranges from $15 to $100, averaging about $50. Farm land in the neighborhood of Palmyra and Scotland Neck is valued at $40 to $100 an acre, and around Halifax and Weldon at $20 to $100. Near Enfield farms are offered at $40 to $75 an acre, and near Littleton at $20 to $75.

SOILS.

On the basis of origin the soils of Halifax County may be classed in three groups: Residual soils, of the Piedmont Plateau; sedimentary soils, of the Coastal Plain; and alluvial soils, developed along streams throughout the county. The line which separates the Piedmont Plateau from the Coastal Plain extends northeastward from a point on the southern boundary of the county near the mouth of Little Fishing Creek, passing midway between Brinkleyville and

[1] The census tabulates each tenancy as a farm.

Heathsville and continuing through Webbs Crossroads and Walkers Crossroads to Bolling, on the northern border of the county.

The residual soils have been derived through the weathering of the crystalline rocks underlying the Piedmont Plateau. These rocks consist mainly of granites and slates, but there are included some very small areas of mica schist and diorite.

The granites are prevailingly medium to coarse in texture, but in places there are areas of porphyritic granite. The granitic rocks in most places are deeply weathered, and there are few outcrops, but in a few places, particularly in the areas of porphyritic granite, the disintegrated bedrock is encountered at a depth of about 18 inches. The various granitic rocks give rise to the soils of the Cecil, Appling, and Durham series. The Cecil sandy loam and clay loam are derived from medium-textured granites, and the Cecil very coarse sandy loam from porphyritic granite. The Appling and Durham soils owe their origin mainly to the binary granite.

The slates are much less extensive than the granites. They closely resemble the slates of Rowan, Davidson, Cabarrus, Stanly, Granville, and Union Counties, and other counties of North Carolina, and they are probably of similar origin. They differ slightly in having a honestone or whetstone texture in most places, but there are several small areas of very fine-textured slates in this county. These rocks have weathered to great depths, and there are only a few outcrops. The soils derived from slates are classed in the Georgeville and Alamance series.

The Cecil series includes the most important and widely distributed soils of the Piedmont Plateau. It is characterized by its red clay subsoil and its gray to red surface soils ranging in texture from sand to clay, the lighter colors prevailing in the sandy members. A characteristic of the subsoil is the content of sharp quartz sand and the frequent occurrence of quartz veins.

The Appling series is characterized by grayish to pale-yellow surface soils, and a mottled or streaked red and yellow subsoil. In places the yellow color varies to red, and grayish or drab colors occasionally occur in the subsoil.

The soil of the types included in the Durham series is grayish and the subsoil yellow. These soils are derived from light-colored, medium to coarse grained granite and gneiss, consisting principally of quartz and feldspar, with some mica.

The Georgeville series is characterized by gray to red, silty surface soils, and red silty clay subsoils.

The surface soils of the types in the Alamance series are gray to almost white, and of silty or very fine sandy texture. The subsoils are composed of yellow, rather compact, silty or very fine sandy clay. Scattered over the surface of some areas are fragments of the parent rocks, which belong to the Carolina slates.

In some small areas along the line between the Piedmont and Coastal Plain provinces the soil consists of a surface deposit of Coastal Plain sediment over residual clays of the Piedmont Plateau. It is classed in the Bradley series.

The types included in the Bradley series have grayish soils and clay or silty clay subsoils, predominantly red, slightly mottled with yellow or gray. These soils represent a thin deposit of Norfolk material over Cecil and Georgeville material.

The sedimentary soils owe their origin to the weathering of unconsolidated sands and clays of the Coastal Plain. The geological formation covering the Coastal Plain region of the county is described as the Columbia, of Pleistocene Age.[1] It consists of sediments washed from the Appalachian Mountains and Piedmont Plateau and deposited in this region. Since these sediments were deposited they have been changed considerably by weathering and erosion.

With the establishment of drainage systems and the development of surface relief the activity of weathering agencies, especially oxidation, has been greatly increased. The maximum stage of oxidation is reached in the Orangeburg and Ruston soils, which invariably occur in well-drained situations. The brownish-red and red colors in the subsoil of these series are indicative of thorough oxidation. The lowest stage of oxidation in the Coastal Plain soils of the county is found in the soils of the Portsmouth series, while the Coxville soils are but slightly more advanced in their stage of development. The soils of both series occur in poorly drained situations, and not only has oxidation been retarded but in many places deoxidation has taken place, resulting in the development of a whitish color in the subsoil. The soils derived from Coastal Plain sediments are classed in the Orangeburg, Ruston, Norfolk, Coxville, and Portsmouth series.

The Orangeburg series includes types with a gray to reddish-brown soil and a red, friable sandy clay subsoil. A characteristic of the Orangeburg series is the rolling surface in which it occurs and the thorough drainage of both soil and subsoil.

The types included in the Ruston series have gray to grayish-brown soils, underlain by a reddish-yellow to yellowish-red or dull-red, moderately friable subsoil, prevailingly of sandy clay. This series holds an intermediate place between the Orangeburg and Norfolk in subsoil color.

The types in the Norfolk series are characterized by the light-gray to grayish-yellow color of the surface soils, and by the yellow color and friable structure of the subsoils. The Norfolk soils occupy nearly level to rolling uplands.

[1] By L. W. Stephenson, Vol. III, N. C. Geological and Economic Survey, p. 410.

The soil of the types in the Coxville series is dark gray to nearly black in color, and the subsoil ranges from a moderately mellow, friable clay in the upper part to a yellowish, rather plastic, compact clay, mottled with drab and bright red in the lower part. The surface is prevailingly flat, and many areas require artificial drainage before they can be successfully used for agriculture.

The Portsmouth series includes types with dark-gray to black soils, high in organic matter, and light-gray to mottled gray and yellow subsoils. In the heavier members the subsoil is plastic, although it usually has a noticeable content of sand. Soils of the Portsmouth series are developed in flat to slightly depressed, poorly drained situations, and require ditching before they can be used for agriculture.

The alluvial soils consist of material washed from the uplands by streams and reworked and deposited at times of floods. These soils occur in the present flood plains of streams and also on former flood plains, or terraces, which now lie above the first bottoms and are not subject to overflow. The alluvial soils along the streams in the Piedmont section of the county and along the Roanoke River and Fishing Creek consist of the weathered products of granites, gneiss, schists, slates, and other crystalline rocks, brought down from the Appalachian Mountains and Piedmont Plateau. With differences in topography, drainage conditions, and physical characteristics these soils are classified in five series. The Wickham, Altavista, and Roanoke series include the terrace soils, and the Toxaway and Congaree series the first-bottom soils. The first-bottom and terrace soils along the smaller streams in the Coastal Plain region and in small areas along the Roanoke River and Fishing Creek consist of material washed from Coastal Plain uplands. The terrace soils here are classed in the Kalmia and Myatt series and those of the first bottoms in the Ochlockonee series.

The surface soils of the types included in the Wickham series are reddish or reddish brown. The subsoil typically consists of reddish, friable clay. The Wickham soils generally have a level or gently undulating surface and are fairly well drained. The subsoil is retentive of moisture.

The surface soils of the Altavista series are gray or whitish. The subsoil consists of a yellow or mottled yellow and pale brownish gray, friable clay. The Altavista soils occupy level to undulating areas and are in general poorly drained.

The Roanoke series consists of light-gray to dark-gray or yellowish-gray soils underlain by a mottled gray and yellow, tough, rather plastic clay subsoil, which is frequently mottled with red in the lower part of the 3-foot section. These soils occupy flat areas, and are poorly drained. They are usually developed adjacent to the uplands.

The surface soils of the Toxaway series vary in color from brown to dark gray or black. The subsoils consist of drab to nearly black material ranging in texture from clay to fine sandy clay.

The soils and subsoils of the Congaree series are brown to reddish brown, there being comparatively little change in texture, structure, and color from the surface downward. Occasionally grayish and yellowish mottling is encountered in the subsoil of poorly drained areas.

The surface soils of the Kalmia series are gray to grayish yellow. The subsoils are yellow or mottled yellow and gray. In the better drained areas the Kalmia soils resemble very closely the corresponding members of the Norfolk series.

The Myatt series includes soils with gray to dark-gray color, resting on gray to mottled gray and yellow, more or less impervious subsoils. These soils occupy very poorly drained areas on terraces along streams in the Coastal Plain. For the most part the areas lie above overflow, but are flat and remain wet for long periods after heavy rains.

The types of the Ochlockonee series have dark-gray to brownish soils and brownish or mottled brownish, yellowish, and gray subsoils. The surface is nearly level, and the land is inundated for long periods.

In the following pages of this report the various soils mapped in Halifax County are described in detail and discussed in their relation to agriculture. The table below shows the actual and proportionate extent of each type, and the accompanying map shows the distribution of the soils over the county.

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Norfolk fine sandy loam	88,320	23.2	Orangeburg sandy loam	8,640	1.9
Deep phase	17,472		Roanoke loam	8,448	1.9
Norfolk sandy loam	33,920	7.5	Toxaway clay loam	8,320	1.8
Ochlockonee loam	28,352	6.2	Portsmouth very fine sandy loam	7,616	1.7
Cecil sandy loam	27,520	6.0	Cecil clay loam	7,040	1.5
Congaree silty clay loam	25,600	5.6	Bradley sandy loam	6,720	1.5
Wickham fine sandy loam	23,040	5.1	Myatt very fine sandy loam	6,208	1.4
Coxville very fine sandy loam	18,048	3.9	Norfolk very fine sandy loam	5,056	1.1
Ruston fine sandy loam	17,920	3.9	Wickham very fine sandy loam	4,544	1.0
Appling sandy loam	17,152	3.8	Norfolk sand	4,480	1.0
Altavista very fine sandy loam	16,192	3.6	Georgeville silty clay loam	3,776	.8
Georgeville silt loam	14,080	3.1	Congaree fine sandy loam	1,664	.4
Ruston sandy loam	14,080	3.1	Wickham sand	1,024	.2
Cecil very coarse sandy loam	11,520	2.5			
Kalmia fine sandy loam	10,368	2.3	Total	455,040	
Durham sandy loam	8,960	2.0			
Alamance very fine sandy loam	8,960	2.0			

CECIL VERY COARSE SANDY LOAM.

The Cecil very coarse sandy loam, to a depth of 8 to 12 inches, consists of a grayish-brown to brown, fine to medium sandy loam containing 20 to 50 per cent of very coarse, angular quartz sand and fine gravel. The subsoil is a red, stiff, brittle clay, carrying a small percentage of fine gravel and a noticeable quantity of fine mica flakes. At a depth of about 24 to 30 inches the subsoil grades into the disintegrated parent rock. On some slopes and knolls the surface soil has been washed off, leaving the red clay subsoil exposed. There are included with this type several small areas of Appling very coarse sandy loam, Durham very coarse sandy loam, and Cecil sandy loam.

The Cecil very coarse sandy loam occurs principally between Brinkleyville and Gretna Green. It is mapped in typical areas near Brinkleyville, Warren's Store, Warren's Mill, and Crawley's Store. It is one of the most even surfaced soils in the Piedmont region. The surface in general is undulating to gently rolling, but gullied areas occur on some of the steeper hill slopes. The type is well drained.

This soil is not of great agricultural importance, and probably not more than 10 per cent of it is under cultivation. The remainder is forested with shortleaf pine, oak, and scattered dogwood, persimmon, and locust. The principal crops grown are cotton, corn, and tobacco. According to reports of farmers, cotton yields one-fourth to 1 bale per acre, averaging about one-half bale; corn 10 to 50 bushels, averaging 20 bushels; and tobacco 400 to 1,000 pounds, with an average of about 550 pounds.

This soil is easily tilled, and the draft stock used is largely of medium weight. The best yields are obtained where the soil is thoroughly broken with a heavy turning plow, or with a turning plow followed by a subsoiler. All the more important crops are fertilized. In normal times an 8–3–3 fertilizer at the rate of 200 to 500 pounds per acre is used for cotton, and 600 to 1,000 pounds for tobacco. For corn following clover about 300 to 400 pounds of 16 per cent acid phosphate is used per acre.

The price of land of the Cecil very coarse sandy loam ranges from $15 to $50 an acre, depending upon the improvements and proximity to highways.

The greater part of this soil is low in organic matter, and would be greatly benefited by the turning under of such crops as clover, cowpeas, and rye. On account of the porous texture of the soil it has a tendency to be droughty, and the turning under of vegetable matter will not only add nitrogen, but will also increase the water-holding capacity. With cotton, corn, and tobacco as the principal crops, green-manuring crops can easily be included in the rotations. The moisture-holding capacity of the soil can be greatly improved by deep breaking.

CECIL SANDY LOAM.

The Cecil sandy loam consists of 8 to 10 inches of gray or brownish-gray, medium sandy loam, passing into red, stiff, crumbly clay which extends to a depth of 36 inches. In most wooded areas the soil is gray in the surface 2 to 4 inches, and pale yellow or grayish brown below this to a depth of 10 inches. The subsoil usually contains a small percentage of angular quartz sand and fine gravel, and in some places fine mica scales are conspicuous in the lower subsoil. On some slopes and knolls the red clay subsoil has been exposed in places by surface wash, giving rise to inextensive "gall spots." At one time the greater part of the Cecil sandy loam in this county was covered by a thin mantle of Coastal Plain material, consisting of unconsolidated sand and gravel. The sands and finer textured materials of this mantle have been removed, leaving on the surface considerable water-rounded quartz gravel. There are included with this type numerous small areas of Cecil very coarse sandy loam, Appling sandy loam, Durham sandy loam, and Cecil fine sandy loam, and an area of about 5 to 10 acres, situated about one-half mile east of Weaver's Chapel, is typical Louisa fine sandy loam, and would be mapped as such if of greater extent.

The Cecil sandy loam is one of the most extensive soils in the Piedmont section of the county. The largest areas occur in the vicinity of Calvary Church, near Nicholsons Mill, and to the east of Brinkleyville along each side of Rocky Swamp. The surface is prevailingly undulating to hilly, becoming steep and broken in places along the streams. Some of the largest interstream areas are undulating to gently rolling. The areas of greatest surface relief occur north of the Seaboard Air Line Railway near Faucett's Store, around Nicholson's Mill, and southwest of Shaw's Store. As a result of the surface relief and the porous nature of the soil, the natural drainage is well established.

The Cecil sandy loam is a desirable soil for general farm crops, and also for fruits, potatoes, and other vegetables. About 25 per cent of it is under cultivation. The forest growth on the remainder consists largely of shortleaf pine and oak, with scattered dogwood, locust, persimmon, and cedar. In some areas there is considerable hickory. The principal crops grown are cotton, corn, peanuts, and tobacco. Cowpeas, wheat, oats, rye, crimson clover, and soy beans are grown in a small way, and vegetables, including Irish potatoes, sweet potatoes, and melons, are produced for home consumption. Nearly every farmer raises a few hogs to supply pork, bacon, and lard for domestic use and a small surplus to be sold on the local markets.

Cotton yields one-third to 1 bale per acre; corn 15 to 40 bushels, averaging about 20 bushels; peanuts 10 to 60 bushels, averaging 30

bushels; and tobacco 500 to 1,200 pounds, averaging about 700 pounds. Wheat yields 10 to 20 bushels per acre.

The Cecil sandy loam can be worked into a good tilth with draft stock and implements of medium weight. All crops are fertilized to a greater or less extent. Cotton ordinarily receives 500 pounds of an 8–3–3 fertilizer per acre. When corn follows clover it is customary to apply 300 or 400 pounds of 16 per cent phosphoric acid per acre. On some farms the only fertilizer given this crop is 60 to 75 pounds of nitrate of soda per acre in the form of a top-dressing. As a rule peanuts are not fertilized, although good results have followed the use of 300 pounds per acre of a 10–4–1 mixture. Peanuts generally follow cotton, which is invariably fertilized, and dependence is placed upon the residual effects of fertilizer applied for the preceding crop. Tobacco receives an acreage application of 600 to 1,000 pounds of an 8–3–3 fertilizer. From 300 to 500 pounds of 16 per cent phosphoric acid per acre is applied to wheat.

The selling value of land of the Cecil sandy loam ranges from $20 to $100 an acre, averaging about $50. The highest prices are commanded by smooth interstream areas near highways.

This soil in general is deficient in organic matter, which can be easily and cheaply supplied by turning under such crops as cowpeas, soy beans, clover, and rye. With the variety of staple crops grown at present, a number of rotations, including green-manure crops, can be conveniently arranged. One of the most satisfactory rotations in use is as follows: Tobacco, followed by clover in the fall, the first year; corn the second year; and peanuts the third year. Another good rotation consists of cotton the first year; corn the second year, with cowpeas broadcasted at the last cultivation; and cotton the third year. Some farmers follow corn with wheat in the fall, and sow cowpeas in the summer of the second year; this crop is followed by clover, and corn or cotton is grown the third year. A fourth good rotation consists of cotton the first year, peanuts the second year, and tobacco the third year, clover being seeded following the tobacco, and corn being grown the fourth year.

The moisture-holding capacity of the Cecil sandy loam can be greatly improved by deep breaking and thorough pulverization of the seed bed, followed by frequent shallow cultivations to break crust after rains. This soil, like most other soils derived from granite, has a considerable supply of potash. The type is especially suited to the production of sweet potatoes and late truck crops.

CECIL CLAY LOAM.

The Cecil clay loam consists of 4 to 6 inches of brownish-red clay loam, underlain to a depth of 36 inches by a red, stiff, crumbly clay subsoil, which carries a small percentage of fine mica flakes. As

mapped it includes some small areas of Cecil coarse sandy loam and sandy loam and a few patches of Cecil clay. In places the soil in the first few inches is a heavy, reddish-brown sandy loam. Outcropping quartz veins give rise to one or two small stony areas.

The Cecil clay loam occurs in the western part of the county. The largest areas are mapped near Thelma, about 2½ miles north of Weavers Chapel, 1 mile north of Medoc, and 2 miles southwest of Ringwood. This soil occupies some of the roughest areas in the county. The surface in general is rolling, hilly, or broken, and the areas overlooking the lowlands of the Roanoke River are broken, the slopes in places being precipitous. A few areas lying at a considerable distance from the streams are undulating to rolling.

Owing to the small extent and rough surface of this soil, it is not important. About 10 per cent of it is under cultivation. The remainder is forested with shortleaf pine, oak, hickory, and cedar. The principal crops grown are cotton, corn, and wheat. Cotton yields one-third to 1 bale per acre, corn 15 to 40 bushels, and wheat 8 to 15 bushels.

This soil occurs in close association with the Cecil sandy loam, and it is handled with the same kind of work stock and implements. Crops receive the same fertilization as on the sandy loam. The soil is naturally strong and capable, where the surface conditions are favorable, of being built up to a high state of productiveness.

The selling value of land of the Cecil clay loam ranges from $15 to $50 an acre.

APPLING SANDY LOAM.

The Appling sandy loam consists of a gray, porous, medium sandy loam, passing into a pale-yellow fine to medium sandy loam at a depth of about 6 to 10 inches. The subsoil, beginning at any depth between 18 and 30 inches, consists of a yellow, friable sandy clay, grading into a pale-red or mottled yellow and red, brittle clay. The subsoil frequently passes into the decomposed bedrock at depths of 30 to 36 inches. There are included with the type some small areas of Appling very coarse sandy loam, coarse sandy loam, and gravelly sandy loam, and Durham sandy loam, as well as patches of Cecil sandy loam. On the surface in places there is considerable water-rounded quartz gravel, representing residue from a thin mantle of Coastal Plain material which once covered this part of the county.

The Appling sandy loam occurs mainly in the northwestern part of the county, between Thelma and Littleton and as far south as Brinkleyville. It is most typically developed at Weavers Chapel, and in areas situated 1 mile east of Littleton, 2½ miles northeast of Print, and 2 miles southwest of Hawkins Chapel. Numerous smaller areas are mapped throughout the western end of the county. The surface

ranges from undulating and gently rolling in interstream positions to steeply rolling and badly broken as the streams are approached. The roughest areas occur north of the Seaboard Air Line Railway and in the vicinity of Roper Springs. On account of the open, porous texture of the soil and the rolling surface, the drainage is thorough and in places excessive.

Among the Piedmont soils the Appling sandy loam ranks next to the Cecil sandy loam in importance. Probably about 15 per cent of it is cleared and cropped. The forest growth on the remainder consists mainly of hickory, oak, shortleaf pine, and dogwood, with scattered locust and persimmon. The principal crops grown are cotton, peanuts, tobacco, and corn. Sweet potatoes, Irish potatoes, fruits, and garden vegetables are grown in a small way, principally for home use. On most farms a small patch is devoted to sorghum, for feeding hogs and for making sirup. Nearly every farmer raises a few hogs to supply meat for home use, and some farmers near Littleton occasionally sell a few. A small dairy farm is situated on this soil near Littleton. Cotton yields one-fourth to 1 bale per acre, peanuts 15 to 60 bushels, tobacco 500 to 1,200 pounds, and corn from 10 to 40 bushels.

This type is handled and fertilized in the same way as the Cecil sandy loam, and the land is held at about the same price. It can be improved by the methods suggested for the Cecil sandy loam.

DURHAM SANDY LOAM.

The surface soil of the Durham sandy loam consists of 6 to 10 inches of light-gray, medium sandy loam or loamy sand, passing into a pale-yellow, medium sandy loam which extends to 18 or 20 inches. The subsoil is a yellow, brittle sandy clay, or friable clay, with faint mottlings of red and occasional white, chalky spots. The subsoil frequently grades into the disintegrated parent rock at a depth of 20 to 30 inches. There are included with this type small areas of Durham gravelly sandy loam, Durham coarse sandy loam, and Appling coarse sandy loam. Like the Cecil sandy loam and the Appling sandy loam, the type in places carries on the surface a considerable quantity of water-rounded quartz stones. Where it grades into the soils derived from slates it includes some narrow strips of Durham fine sandy loam.

The Durham sandy loam is confined to the northwestern part of the county. The most important areas occur 3 miles northeast of Littleton, 1 mile northwest of Thelma, near Hawkins Chapel, around Williams Store, and 1 mile south of Bear Swamp Church. The surface varies from gently rolling to steeply rolling and hilly. In some places the type occupies the crests of drainage divides and has a

comparatively smooth surface, but as the streams are approached the land becomes more rolling, and in most places overlooking the stream bottoms the surface is hilly, with steep slopes. The uneven surface and the loose structure of the soil give thorough drainage.

About 20 per cent of this type is cleared and in cultivation. The forested areas support a growth of white oak, post oak, red oak, hickory, shortleaf pine, dogwood, and persimmon. The type is used chiefly for the production of cotton, tobacco, corn, and peanuts. Cotton yields one-fourth to two-thirds bale per acre, tobacco 500 to 1,200 pounds, corn from 10 to 40 bushels, and peanuts 15 to 60 bushels.

The Durham sandy loam warms up early in the spring. Only light to medium weight work stock and implements are necessary in the preparation of the seed bed and in subsequent cultivation. The soil is apt to wash where it is plowed to only a shallow depth, and terracing has been necessary in places. The same methods of fertilization are followed as on the Cecil and Appling sandy loams.

The value of land of this type ranges from $12 to $50 an acre, averaging about $30. The highest priced farms are in the neighborhood of Airlie and Williams Store.

The Durham sandy loam in its natural state is deficient in nitrogen and phosphoric acid, and farmers should supply these materials in the form of artificial fertilizers or handle the soil in such a way as to make these elements in the soil more available. The most successful cropping systems now practiced consist of the rotation of the clean-culture crops with leguminous and green-manuring crops, such as clover, cowpeas, rye, and soy beans. The same rotations are followed as on the Cecil sandy loam. The loose, porous structure of the soil tends to make it droughty, and the turning under of vegetable matter would be especially beneficial in improving the moisture-holding capacity. This can be further improved by breaking the soil deeply and giving frequent shallow cultivations. Nitrogen can be incorporated by turning under green manures. An inferior quality of tobacco is produced following a leguminous crop. To obtain the best grade of tobacco it is nearly always necessary to use a fertilizer mixture containing potash.

GEORGEVILLE SILT LOAM.

The Georgeville silt loam, to a depth of 6 to 10 inches, consists of a reddish-gray or brownish silt loam, carrying a high percentage of very fine sand. The subsoil is a red, stiff silty clay, of smooth, tough structure. There are included with the type some small areas of brownish very fine sandy loam and of red, silty clay. In some places there is present on the surface a considerable quantity of water-rounded quartz gravel particles, varying in diameter from a frac-

tion of an inch to 2 inches. This gravel is so abundant in some patches as to give rise to a gravelly silt loam soil.

The Georgeville silt loam is confined to the extreme southwestern part of the county. Between Little Fishing Creek and the Warren County line it occupies about one-half of the total soil area. It is typically developed near Knights Crossroads, 1 mile west of Essex, and in the vicinity of Austins Store. An isolated area occurs 1 mile east of Thelma, on the northern border of the county.

The surface is gently rolling and rolling in the interstream areas, but becomes more steeply rolling and broken near the stream bottoms. The smoothest areas occur 1 mile west of Hollister and along the county road between Essex and Rossers Bridge. The surface drainage is good, but on account of the heavy, compact nature of the subsoil the subsurface drainage is not as well established as in the Cecil, Durham, and Appling soils.

Only a very small percentage of the Georgeville silt loam is in cultivation. The native forest growth at present consists of longleaf pine and oak. At one time there was a merchantable growth of shortleaf pine, but most of this has been removed. The principal crops are cotton, corn, peanuts, and wheat. Tobacco is grown in a few patches. Cotton yields one-fourth to 1 bale per acre, corn 10 to 40 bushels, peanuts 15 to 50 bushels, and wheat 8 to 20 bushels.

Agriculture in the western part of the county, where the Georgeville silt loam occurs, is more poorly developed than in any other section. Most of the breaking is done with 1-horse plows, and the seed-bed preparation is generally inadequate. Cotton generally is fertilized with 200 to 500 pounds of an 8–2–2 or 8–3–3 preparation per acre. Wheat and corn usually follow clover, and are given light applications of acid phosphate.

Land of this type sells at $10 to $50 an acre.

GEORGEVILLE SILTY CLAY LOAM.

The Georgeville silty clay loam consists of a red or brownish-red silty clay loam, underlain to a depth of 36 inches or more by a red, stiff silty clay. Throughout the type there occur patches of gray or brown very fine sandy loam and silt loam too small to show separately on the soil map.

This type occurs in close association with the Georgeville silt loam. The most important areas are mapped 2 miles west of Whiteoak Church, 1 mile east of Lees Chapel, and 2 miles west of Ringwood. Numerous smaller areas occur between Little Fishing Creek and the western boundary of the county. The surface varies from gently rolling to undulating and hilly, with precipitous slopes along the streams. Surface drainage is good, but on account of the heavy, compact nature of the subsoil the subsurface drainage is not very well established.

This type is of small extent, and is not important in the agriculture of the county. Only a small proportion of it is cleared and cultivated. The forest growth on the remainder consists of shortleaf pine and a variety of oaks. The principal crops grown are cotton, corn, and wheat. Cotton yields one-fourth to three-fourths bale per acre, corn 15 to 40 bushels, and wheat 8 to 20 bushels. The soil is fertilized in the same way as the Georgeville silt loam. Land of this type is valued at $15 to $60 an acre.

ALAMANCE VERY FINE SANDY LOAM.

The surface soil of the Alamance very fine sandy loam consists of 4 to 6 inches of light-gray or gray very fine sandy loam, passing into a pale-yellow very fine sandy loam which extends to a depth of 12 to 15 inches. The subsoil is a yellow, mealy very fine sandy clay. In places the parent rocks consist of interbedded diorite and slate, and here the subsoil varies from typical in being more plastic and mottled with gray, brown, and red. In some places rounded quartz pebbles are abundant on the surface, and in other places there are numerous angular, white quartz stones. As mapped the type includes a few areas of Alamance silt loam, Alamance fine sandy loam, and Georgeville silt loam, too small to be shown separately on the soil map.

The Alamance very fine sandy loam is confined to the southwestern part of the county. Areas of very irregular outline occur in the vicinity of Hollister and south of this point along Powells Creek to Battles Bridge. One small area occurs in the northern part of the county southeast of Adams Store. This type has a more even surface than any other soil of the Piedmont region. Many areas occupy flats or depressions. The only steeply rolling and badly broken areas occur along the slopes to the stream bottoms. Only the sloping areas are well drained, and it is necessary to construct ditches in order to bring the greater part of the type under cultivation.

Only a small percentage of this soil is cultivated. The remainder is forested with shortleaf pine, oaks, sweet gum, black gum, poplar, cedar, and maple. Some of the flat areas and depressions support a fairly good growth of native grasses. The principal crops grown are cotton, corn, and wheat. Cotton yields from one-fourth to three-fourths bale per acre, corn 10 to 30 bushels, and wheat 8 to 12 bushels. Tobacco is grown to some extent, principally on a few included patches of Alamance fine sandy loam. The crop yields 500 to 800 pounds per acre. Cotton is fertilized lightly with an 8–2–2 or 8–3–3 mixture, when this is available. Wheat and corn usually receive acreage applications of about 200 pounds of acid phosphate.

The selling value of land of this type is low. In general it is held at $10 to $40 an acre. Artificial drainage is the first step necessary for its improvement.

In the table below are given the results of mechanical analyses of samples of the soil and subsoil of the Alamance very fine sandy loam:

Mechnical analyses of Alamance very fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
234102	Soil	3.4	4.4	2.8	18.2	33.2	31.6	6.4
234102a	Subsoil	2.9	3.0	1.8	10.4	21.4	29.3	31.1

BRADLEY SANDY LOAM.

The Bradley sandy loam represents a gradation between Coastal Plain soils and Piedmont soils. The surface soil is of sedimentary origin, while the subsoil is wholly or in part residual. The soil to a depth of 6 to 15 inches consists of a gray, medium sandy loam or loamy sand. The subsoil is a red crumbly clay, usually containing more or less finely divided mica and a small percentage of angular quartz sand. As mapped the type includes small areas of Bradley gravelly sandy loam and very coarse sandy loam. In a few places the subsoil consists of a red silty clay derived from slates, and in one or two localities it is a yellow, brittle sandy clay, with occasional white, gray, and red mottlings. About 2 miles east of Warrens Store and in the vicinity of Lewis Crossroads the subsoil is a brown or reddish-brown sandy clay, grading into a red, compact, crumbly clay.

Included with this type and shown on the soil map by gravel symbols are some small areas of Bradley gravelly sandy loam. This soil is similar to the typical Bradley sandy loam except that it carries 10 to 50 per cent of white or brown, rounded quartz gravel particles, varying in diameter from one-fourth inch to 2 inches. The largest of these gravelly areas occur near Shaws Store, northeast of Hines Crossroads, and northwest of Ringwood. Very little of this gravelly soil is under cultivation.

The Bradley sandy loam is one of the least extensive soils in the county. The most important areas lie north of Lewis Crossroads, south of Bethlehem Church, 2 miles north of Nevilles Store, and 2 miles east of Ringwood. A large percentage of the type occupies slopes to the stream bottoms and has a decidedly rolling or hilly surface. Farther back from the streams the surface is smooth. Drainage ranges from thorough to excessive.

On account of its small extent this type is not important in the agriculture of the county. Probably about 20 per cent of it is

cropped. The native vegetation consists of pine, oak, hickory, gum, dogwood, and various shrubs. Cotton, corn, and peanuts are the principal crops. Cotton yields one-fourth to 1 bale per acre, corn 10 to 40 bushels, and peanuts 15 to 60 bushels. These crops receive the same fertilization as on adjoining soils. The type can be improved by the methods suggested for the Norfolk sandy loam. Land of the Bradley sandy loam is valued at $10 to $50 an acre.

ORANGEBURG SANDY LOAM.

The Orangeburg sandy loam consists of a gray or brownish-gray, medium sandy loam or loamy sand, 6 to 8 inches deep, passing into a yellowish sandy loam which extends to a depth of 10 to 18 inches. The subsoil is a red, friable sandy clay. There are included with the type some small areas of Orangeburg fine sandy loam, Ruston sandy loam, and Ruston fine sandy loam. Near Roanoke Rapids and in a few other places the soil consists of a brownish-red fine sandy loam, underlain at 6 to 10 inches by a red, moderately plastic fine sandy clay. These areas represent the Greenville fine sandy loam, and would be mapped as such if sufficiently extensive. On the surface of some of these areas there is a noticeable quantity of brown, rounded iron concretions. In the area north of Rocky Swamp Church and in a few small areas throughout the type the surface soil consists of 10 to 15 inches of gray, fine to medium sandy loam, carrying a large percentage of small, rounded iron concretions. The subsoil here is yellow to brown in color, and somewhat more plastic than typical. This soil belongs properly to the Tifton series.

The Orangeburg sandy loam occurs in the western and northern parts of the county. The largest areas are mapped in the vicinity of Roanoke Rapids, Weldon, Ringwood, and Rocky Swamp Church. The surface is for the most part gently rolling to rolling, and drainage is good.

This is considered a valuable soil for nearly all the common crops, and about 60 per cent of it is cultivated. The native tree growth consists of pine, oak, sweet gum, black gum, and dogwood. The type is used mainly for the production of cotton, peanuts, corn, cowpeas, and tobacco. When properly handled and fertilized it gives good yields. Cotton yields one-half bale to 2 bales per acre, peanuts 20 to 65 bushels, corn 15 to 45 bushels, and tobacco 700 to 1,300 pounds.

This soil is mellow and easily tilled. The type occurs mainly in highly developed sections of the county, and part of it is handled under very efficient farming methods, including systematic crop rotations, deep breaking, and heavy fertilization. Cotton is given an acreage application of 500 to 1,000 pounds of an 8–3–3 or 8–4–4

fertilizer when this can be had. The fertilizer used in 1916 was mainly an 8–4 mixture. Peanuts usually follow cotton and receive no fertilizer, but the crop is usually limed. Corn is given about 200 to 500 pounds per acre of an 8–3–3 or 8–4–4 fertilizer, or of 16 per cent acid phosphate where the crop follows clover.

The Orangeburg sandy loam is one of the highest-priced soils in the county. The land ranges in value from $20 to $100 an acre.

RUSTON SANDY LOAM.

The Ruston sandy loam consists of 8 to 18 inches of gray to pale yellowish gray, medium sandy loam, underlain by brownish-red or light-red, moderately plastic clay. The sandy layer is invariably lighter colored below a depth of 8 inches, being yellowish or reddish yellow. In narrow strips bordering stream bottoms there is frequently an abundance of water-rounded quartz pebbles on the surface and throughout both soil and subsoil. These gravelly areas are shown on the soil map by symbol.

The Ruston sandy loam occurs mainly near the western border of the Coastal Plain division of the county. It is mapped in areas of considerable size 2 miles south of Rooks Store, 2 miles southeast of Ringwood, at Medoc, and 2 miles southwest of Heathsville. Numerous smaller areas occur along each side of Rocky Swamp at a considerable distance from the stream. In general the surface is gently rolling to rolling, becoming more steeply rolling as the larger streams are approached. Owing to the rolling surface and the loose, porous structure of the soil, it is well drained.

This is considered a fairly desirable soil for all the crops common to this section of North Carolina. About 25 per cent of it is cultivated. On the forested areas there is a growth of shortleaf pine, oak, black gum, hickory, and dogwood. The principal crops grown are cotton, peanuts, corn, and tobacco. Cotton yields range from one-third bale to 2 bales per acre. Peanuts yield 15 to 60 bushels per acre, corn 15 to 45 bushels, and tobacco 500 to 1,200 pounds. The fertilizers used are practically the same as on the Orangeburg sandy loam. Land of the Ruston sandy loam is valued at $15 to $75 an acre.

Many areas of this soil are deficient in organic matter, and yields could be greatly increased by turning under green-manure crops.

RUSTON FINE SANDY LOAM.

The surface soil of the Ruston fine sandy loam consists of a gray or brownish fine sandy loam or loamy fine sand, passing at 5 to 8 inches into a yellowish, mellow fine sandy loam which extends to a depth of 10 to 18 inches. This is underlain by a yellowish-red or brownish-red to light-red, moderately heavy clay subsoil. There are included with the type some small areas of Norfolk fine sandy loam and Susquehanna sandy loam.

The Ruston fine sandy loam occurs widely scattered throughout the greater part of the Coastal Plain region. The largest areas are situated near Taylors Store, immediately east of Heathsville, around Aurelian Springs, on the east side of Beech Swamp, near Dunns Store, 1 mile west of Rose Neath Church, 2 miles west of Tillery, and near Spring Hill School. Numerous smaller areas occur throughout the central and southeastern parts of the county.

The surface varies from nearly level or gently undulating to rolling, steeply rolling, and hilly. The most even-surfaced areas of any considerable size are situated near Glenview and to the east of Heathsville. In some places narrow strips of this type occupy the slopes to streams, and are almost invariably too steep for cultivation. Natural drainage throughout the type is well established.

This is considered a good soil for all the common crops. Approximately 40 per cent of it is farmed. The forested areas support a growth of pine, oak, black gum, sweet gum, hickory, and dogwood. Cotton, peanuts, corn, tobacco, and cowpeas are the principal crops grown. Cotton yields one-third to 1 bale per acre, peanuts 15 to 65 bushels, corn 10 to 40 bushels, and tobacco 500 to 1,000 pounds.

Owing to its wide distribution there is considerable variation in the methods of fertilization on this type. On most farms cotton receives acreage applications of 200 to 1,000 pounds of an 8–3–3 or 8–4–4 fertilizer. It is customary in all sections of the county to use nitrate of soda as a top-dressing, at the rate of 100 to 150 pounds per acre. As a rule peanuts are not fertilized directly, but lime is generally used on this crop. Corn receives about the same grade of fertilizer as cotton, but the acreage applications are only about half as large. From 600 to 1,000 pounds per acre of an 8–4–4 fertilizer is ordinarily applied to tobacco.

Land of the Ruston fine sandy loam is valued at $15 to $60 an acre.

This soil is low in organic matter, which can be supplied by following such crops as cotton and tobacco with green-manure crops of rye or clover in the early fall. When corn is grown it is more convenient to use cowpeas as the manuring crop. A liberal application of lime is usually beneficial following the turning under of a green crop. Crop rotations including the legumes are followed by a few farmers. In handling this soil the crop rows are usually run straight regardless of the surface contours, and as a result the surface soil has been eroded away in many places in the sloping areas, leaving the subsoil exposed.

NORFOLK SAND.

The Norfolk sand consists of about 4 to 8 inches of gray, medium sand, underlain to a depth of 36 inches or more by light-gray or pale-yellow, incoherent sand. Between Enfield and Halifax, about 2 miles northwest of Darlington School, to the west of Halifax, and southeast of Delmar, there are included some small areas of Norfolk fine sand, which has a mellow, mealy structure.

Only a few small areas of Norfolk sand are encountered in Halifax County. The most important are situated 1½ miles southeast of Halifax, 1 mile east of Delmar, 1½ miles northeast of Darlington School, and near Quankey Church. The surface is undulating to gently rolling, and drainage is thorough. The productiveness of this type is low, and it is not important agriculturally. Probably 25 per cent of it is cleared. The native tree growth consists mainly of blackjack oak.

Cotton, corn, and peanuts are grown in a small way. The yields of all crops are comparatively low, except in years when the moisture conditions are very favorable. In some instances cotton receives a slightly heavier application of potash than would be made on a soil underlain by a clay subsoil. In a few instances peanuts receive a light application of a low-grade fertilizer.

Land of the Norfolk sand is valued at $10 to $40 an acre.

In order to obtain satisfactory yields on this type it is necessary to fertilize each crop heavily or add barnyard manure. It would be beneficial to plow under green-manure crops, such as cowpeas and rye.

NORFOLK SANDY LOAM.

The soil of the Norfolk sandy loam consists of about 6 to 8 inches of gray, medium sandy loam or loamy sand, passing into a light-gray or pale-yellow medium sandy loam which extends to depths between 12 and 20 inches. The subsoil to a depth of 36 inches or more consists of a yellow, friable sandy clay. Throughout the type there occur small areas of Ruston sandy loam, Norfolk fine sandy loam, and Norfolk sand. There is present on the surface of a few areas a considerable quantity of quartz pebbles.

The Norfolk sandy loam is developed mainly in the western part of the Coastal Plain section of the county. Large areas are mapped between Medoc and Glenview, and throughout the central-northern part of the county. It is the predominating type between Weldon and Andersons Crossroads. The surface varies from undulating or gently rolling in the interstream areas to rolling, strongly rolling, and hilly as the drainage ways are approached. Some of the smoothest areas occur in the vicinity of Ringwood, near Glenview,

around Darlington School, and about 3 miles northwest of Quankey Church. Surface drainage and subsurface drainage are well established.

The Norfolk sandy loam is considered fairly desirable for all the staple crops. Probably 40 per cent of it is cleared. The tree growth on the forested areas consists of pine, oak, black gum, sweet gum, hickory, and dogwood, with some poplar. Cotton, peanuts, corn, cowpeas, tobacco, and oats are the principal crops. Cotton yields one-third bale to 1½ bales per acre, peanuts 15 to 65 bushels, corn 10 to 50 bushels, and tobacco 500 to 1,000 pounds.

Cotton under normal conditions is fertilized with 200 to 1,000 pounds of an 8–3–3 or 8–4–4 mixture per acre, followed by a top dressing of nitrate of soda at the rate of 100 pounds per acre. Corn is fertilized with the same mixture in applications about one-half as large. Where corn follows clover it may receive 200 to 500 pounds of acid phosphate per acre. In some cases this crop is not fertilized. Many farmers use various home mixtures for all crops except peanuts.

Land of the Norfolk sandy loam ranges in price from $20 to $100 an acre. The highest-priced areas are situated near Weldon, Roanoke Rapids, and Ringwood.

Like all the other upland soils, this type is generally deficient in organic matter. Its productiveness and water-holding capacity can be greatly increased by incorporating vegetable matter in the soil through the turning under of cowpeas, clover, or rye and the addition of barnyard manure. The nitrogen content of the soil is greatly increased when leguminous crops are grown, even if the greater part of the vegetation is removed.

NORFOLK FINE SANDY LOAM.

The Norfolk fine sandy loam consists of 6 to 18 inches of fine sandy loam or loamy fine sand, underlain by a yellow, moderately friable fine sandy clay subsoil. In the surface 4 to 6 inches the soil is usually gray, while the subsurface stratum is pale yellow. There are included with the type some small areas of Norfolk sandy loam and Ruston fine sandy loam. In the vicinity of Scotland Neck, Hobgood, and Palmyra and in a few other places there are numerous shallow depressions or basins in which the soil consists of gray surface material underlain by a mottled yellow and gray subsoil.

The Norfolk fine sandy loam is the predominating type throughout the Coastal Plain division of the county. It is most extensive in the vicinity of Scotland Neck, Enfield, Crowells Crossroads, and Dawson. The surface is prevailingly level to undulating or gently rolling, but some areas in the vicinity of Scotland Neck, Palmyra, and Hob-

good are nearly flat. Around Crowell Crossroads the surface is undulating to gently rolling, with strongly rolling areas nearer the streams. Drainage throughout the type is good but not excessive. Approximately 60 per cent of this soil is cleared, and a large percentage of the land farmed is in a high state of cultivation. The forested areas support a growth of shortleaf pine, oak, sweet gum, black gum, and dogwood, with scattered persimmon trees and sumac bushes.

The principal crops grown, named in the order of their importance, are cotton, peanuts, corn, cowpeas, and tobacco. The yields of cotton range from one-third bale to 1½ bales per acre, averaging about two-thirds bale. Spanish peanuts ordinarily yield 25 to 30 bushels per acre, with 60 bushels as a maximum. Corn yields 15 to 50 bushels per acre, and tobacco 700 to 1,000 pounds. Virginia peanuts are grown to a small extent. They yield 50 to 100 bushels per acre.

This soil is not generally plowed deep. Deep plowing was introduced about 10 or 15 years ago, and is gradually becoming more common. Under one of the most satisfactory crop rotations in use cotton is followed by peanuts, a cover crop of rye, oats, or clover is seeded after the peanuts are harvested, and the land is put in cotton, corn, or tobacco the third year. If tobacco is grown the third year no cover crop is seeded following the peanuts. In breaking and cultivating this soil medium draft implements are commonly used.

All crops on this soil are fertilized. Ordinarily cotton receives an acreage application of 500 to 1,000 pounds of an 8–4–4 or 8–3–3 fertilizer, followed by 100 to 150 pounds of nitrate of soda as a top-dressing. Peanuts on poor land are given 300 to 400 pounds per acre of a 10–2–2 or 8–3–3 preparation when this can be had. Peanuts consume the surplus fertilizer from cotton, and receive no direct fertilization, but peanut fields are generally limed. Ordinarily corn receives from 400 to 600 pounds per acre of an 8–4–4 fertilizer and a top-dressing of 100 pounds per acre of nitrate of soda. Tobacco land is given 800 to 1,000 pounds per acre of an 8–4–4 or 9–5–5 preparation, or of home mixtures of about the same analysis.

This type of soil includes the highest-priced land in the county. The range is from $25 to $125 an acre. The higher valuations prevail in the vicinity of Scotland Neck, Hobgood, and Palmyra.

In its natural state the Norfolk fine sandy loam is low in organic matter and available potash, and these materials should be furnished by applying commercial fertilizer and incorporating vegetable matter. Organic matter can best be supplied by growing cover crops in rotations. Hog raising on a commercial scale could be successfully developed in connection with the growing of green crops such as rye, rape, clover, oats, and sorghum. On other soil types peanuts

are grown to some extent for fattening hogs, and this crop could be grown on the Norfolk fine sandy loam with equal success. The stock could best be finished on corn, which can well be grown on this soil in larger quantities. Deep breaking, followed by frequent shallow cultivations, would make this soil more retentive of moisture.

Norfolk fine sandy loam, deep phase.—The Norfolk fine sandy loam, deep phase, is separated on account of its deeper surface soil and lower productiveness. It consists of a gray fine sand or loamy fine sand, 4 to 6 inches deep, passing gradually into a light-gray or pale-yellow fine sand or loamy fine sand. The subsoil, beginning at any depth between 20 and 30 inches, is a yellow fine sandy clay.

This phase occurs in small developments throughout the Coastal Plain. Some of the largest areas are mapped in the vicinity of Rose Neath Church, near Quankey Church, southeast of Haywoods Church, and 3 miles southeast of Ruggles. The surface is gently undulating to rolling, and drainage is good.

This phase is of considerable importance in the agriculture of the county. Because of the good drainage it is a desirable soil for residence sites. The greater part of the phase is cleared. Practically the same crops are grown as on the typical soil, and the phase is fertilized in the same way. Crop yields are intermediate between those obtained on the typical soil and on the Norfolk sand. The phase is one of the most desirable soils in the county for tobacco, and it is also well suited to peanuts. It can be improved by the methods suggested for the typical Norfolk fine sandy loam. The land ranges in selling value from $15 to $60 an acre.

NORFOLK VERY FINE SANDY LOAM.

The Norfolk very fine sandy loam consists of 8 to 12 inches of gray or dark-gray very fine sandy loam, underlain by yellow, rather heavy clay. The lower part of the subsoil is frequently mottled with light red in the better-drained areas and with shades of gray in the lower situations. There are included with the type a few small areas of Norfolk fine sandy loam and Coxville very fine sandy loam.

Practically all this soil occurs between Dawson and Tillery in areas which vary in size from a fraction of a square mile to 2 or 3 square miles. The surface is for the most part flat, and natural drainage is poorly developed. Ditching is necessary before the greater part of the type can be cultivated.

Only a small percentage of this soil is under cultivation. It is used for the production of cotton, corn, and peanuts. Cotton yields one-fourth to 1 bale per acre, corn 10 to 40 bushels, and peanuts 15 to 40

bushels. Crops are fertilized in about the same way as on the adjoining soils.

The selling value of the land is rather low, ranging from $15 to $40 an acre.

This soil is naturally strong, and good yields can be obtained where it is sufficiently well drained and properly farmed.

COXVILLE VERY FINE SANDY LOAM.

The surface soil of the Coxville very fine sandy loam is a dark-gray very fine sandy loam, 6 to 10 inches deep. The subsoil consists of a light-gray to drab very fine sandy clay, passing into a stiff, plastic clay which is mottled red, gray, and yellow. There are included with this type some small areas of Coxville fine sandy loam, Coxville loam, and Norfolk fine sandy loam. In some areas near Palmyra and along the Atlantic Coast Line Railroad about halfway between Hobgood and Scotland Neck, the soil and subsoil consist of Norfolk fine sandy loam material to a depth of 24 inches, below which the subsoil is mottled yellow and red. Some small areas of this soil are underlain by a mottled gray and yellow fine sandy clay.

The Coxville very fine sandy loam is one of the most widely distributed soils of the county. The largest and most important areas lie along the Halifax-Martin County line between Palmyra and Hobgood, between Hobgood and Scotland Neck, and to the northwest of Scotland Neck. Numerous smaller developments occur throughout the Coastal Plain section. The surface is level to flat, and many areas occupy basins. Natural drainage is imperfect throughout the type.

This is a strong soil, and in the southeastern part of the county a large percentage of it is cultivated. Probably 15 or 20 per cent of the type has been cleared of the native growth of pine, oak, hickory, black gum, sweet gum, and dogwood. It is estimated that one-third of the cleared area is devoted to the production of cotton, and about the same proportion to peanuts. Corn is the third most important crop. Yields of cotton range from one-third bale to 2 bales per acre, of peanuts from 15 to 50 bushels, and of corn from 15 to 40 bushels.

No attempt is made to cultivate this soil without artificial drainage. In most places it is acid, and it is generally limed. On some farms the soil is deeply broken and well pulverized with heavy machinery. The best farmers follow systematic rotations, in which leguminous crops, such as cowpeas and clover, play an important part. In the southeastern part of the county cotton is given an acreage application of 600 to 1,000 pounds of an 8–4–4 or 10–5–4 fertilizer, and corn about 200 to 700 pounds of an 8–4–4 or 8–4–5 preparation. Peanuts receive no fertilizer, but are usually limed.

The selling value of land of this type ranges from $15 to $100 an acre, the higher prices prevailing in the vicinity of Scotland Neck, Hobgood, and Palmyra.

In the following table are given the results of mechanical analyses of samples of the soil, subsoil, and lower subsoil of the Coxville very fine sandy loam:

Mechanical analyses of Coxville very fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
234128	Soil	0.6	3.4	3.0	15.6	31.0	39.2	7.1
234128a	Subsoil	.6	2.2	2.2	11.6	23.2	36.1	23.7
234128b	Lower subsoil.	.3	1.9	2.6	15.2	16.8	35.8	27.2

PORTSMOUTH VERY FINE SANDY LOAM.

The Portsmouth very fine sandy loam consists of about 6 to 8 inches of dark-gray to black very fine sandy loam, underlain to a depth of 36 inches by a gray fine sandy clay or clay which shows yellow mottlings in the lower part. In places the soil is a loam or fine sandy loam in texture. There are included some small areas of Coxville very fine sandy loam and Norfolk fine sandy loam.

The areas of the Portsmouth very fine sandy loam are small and widely scattered. The largest occur near Palmyra, west of Bells School, 1½ miles southwest of Hobgood, and 1 mile northwest of Scotland Neck. The surface is flat. In order to bring the type under cultivation it is necessary to establish artificial drainage.

Practically the only areas cultivated are small depressions or narrow strips surrounded by well-drained soils. The native vegetation consists of pine, hickory, oak, gum, and dogwood, with a variety of shrubs such as huckleberry and gallberry. Practically the only crop grown is corn. The selling value of the land is controlled by that of the adjoining uplands. Where the Portsmouth very fine sandy loam is thoroughly drained, well limed, and properly broken, good yields can be obtained.

WICKHAM SAND.

The Wickham sand consists of about 6 to 10 inches of brownish-gray or reddish-brown, incoherent medium sand, underlain by pale-red or brownish-red, loose sand. The soil varies considerably in texture from place to place. In some areas it consists of a coarse sand underlain at 12 to 15 inches by beds of very coarse sand or fine quartz gravel. There are included with the type one or two small areas of Wickham fine sand, and also a few small areas of a brownish-gray fine sand underlain by yellowish-brown, mellow fine

sand. These latter areas occur on the second bottoms of Beech Swamp and Fishing Creek, between Merritts Bridge and the southern boundary of the county.

The Wickham sand is developed on the terraces of streams issuing from the Piedmont Plateau. The largest areas occur on the north side of Fishing Creek in the vicinity of Coffields Bridge. A small area is mapped 2½ miles southwest of Norfleet. The surface is level or only gently sloping, but drainage is good.

This is one of the least extensive soils in the county, and it is not important agriculturally, although all of it is cleared and cultivated. It is devoted mainly to the production of cotton, peanuts, and corn. Cotton yields one-third to two-thirds bale per acre, peanuts 15 to 40 bushels, and corn 10 to 25 bushels. In order to obtain satisfactory yields liberal fertilization is necessary. The same methods of fertilization are followed as on adjoining soils.

The selling value of land of the Wickham sand varies with that of the surrounding types.

WICKHAM FINE SANDY LOAM.

The Wickham fine sandy loam consists of 6 to 10 inches of grayish-brown or brownish-red fine sandy loam, underlain by a subsoil of yellowish-brown fine sandy clay or friable clay. The lower subsoil occasionally grades into a brownish-yellow, loamy fine sand. Throughout both soil and subsoil fine mica flakes are conspicuous. There are included with the type some very small areas of other Wickham soils, as well as some narrow strips of Congaree silty clay loam and Altavista very fine sandy loam.

On the terraces along Fishing Creek and Beech Swamp there occur a few small areas of brownish-gray fine sandy loam underlain by pale-red, stiff fine sandy clay. This soil would be mapped as Cahaba fine sandy loam if more extensive. It consists principally of reworked Coastal Plain deposits. All of it is under cultivation.

The Wickham fine sandy loam occurs on the terraces of the Roanoke River and Fishing Creek, and the smaller streams in the Piedmont section of the county. It is typically developed in large areas between Tillery and the State Prison Farm and in the vicinity of Norfleet. A large area occupies Mush Island near Weldon. Smaller areas are encountered near Merritts Bridge and Daniels Bridge, and about 3 miles northwest of Coffields Bridge. The surface is prevailingly level to gently undulating. In some localities there are numerous small knolls, together with low, flat ridges and intervening, shallow, troughlike depressions. The drainage is good.

This is the most extensive soil of the terraces. It is one of the strongest soils in the county, and is held in high esteem as a general-farming type. Practically all of it is under cultivation, mainly to

cotton, peanuts, and corn. In connection with the Congaree silty clay loam it is used to some extent in cattle, hog, and sheep raising. Rye, oats, and clover are sowed on the Wickham fine sandy loam, to be grazed during the early spring, and the native grasses on the Congaree silty clay loam furnish abundant summer grazing. The summer-grazing crops for hogs consist of clover, rape, and sorghum. Later in the season such crops as sweet potatoes, soy beans, and peanuts furnish subsistence. The Wickham fine sandy loam and Congaree silty clay loam in conjunction are well suited to cattle raising. The former type affords suitable locations for silos and cattle barns and produces good winter grazing crops, while the Congaree soil is admirably adapted to summer pasturing and in many areas can be used for no other purpose. Most of the hogs are sold on foot in Norfolk and Richmond. The cattle (feeders) are sold in the fall and shipped to points in Virginia for wintering. One or two stock owners carry cattle over until June and sell the stock in Richmond.

Cotton on the Wickham fine sandy loam yields one-third bale to 1½ bales per acre, peanuts 15 to 60 bushels, and corn 15 to 50 bushels. Cotton is ordinarily given an acreage application of 200 to 800 pounds of an 8–4–4 fertilizer. Peanuts follow cotton and are not fertilized, but some growers apply lime. Corn on some farms is fertilized with 200 to 500 pounds per acre of an 8–4–4 fertilizer, but generally it receives only a top dressing of nitrate of soda. The selling value of land of the Wickham fine sandy loam ranges from $25 to $75 an acre.

In many places this soil has been badly depleted of organic matter through continuous cultivation to clean-culture crops, mainly cotton and peanuts, so that it has a decided tendency to harden soon after rains. This is particularly true in areas of heavy fine sandy loam texture. The soil can be improved by turning under such crops as rye, cowpeas, and clover, and by liberally applying barnyard manure. It can most easily be maintained in good condition on farms which raise cattle and hogs, and stock farming could apparently be profitably extended. In some places large quantities of native hay are harvested from the adjoining Congaree soil, and with some clearing hay could be obtained from nearly all areas of the latter type, to be used in connection with winter pasture on the Wickham fine sandy loam. In Wake County velvet beans are successfully grown on this type, and this crop can be produced in Halifax County with equal success. The foliage and fruit of this plant furnish excellent cattle feed after they have been cured by frost, and the stable manure produced could be used to great advantage in growing cotton and corn. When green crops are turned under it is advisable to make at least a light application of barnyard manure, to hasten the action of bacteria on the vegetable matter. Liming would also prove bene-

ficial. The moisture-retaining capacity of the type can be improved by deep breaking and thorough pulverization of the seed bed.

WICKHAM VERY FINE SANDY LOAM.

The Wickham very fine sandy loam consists of a grayish-brown to reddish-brown very fine sandy loam, 6 to 10 inches deep, underlain by light chocolate brown silty clay. The lower part of the subsoil is generally less compact than the overlying stratum. On the surface and throughout both soil and subsoil there is an appreciable quantity of finely divided mica particles.

This soil occurs in five areas. The largest of these, about 5 square miles in extent, occupies the greater part of the State Prison Farm. Another area forms a crescent on the south side of Mush Island, and a third is situated 4 miles southeast of Weldon. Two small areas are mapped east of Tillery. The surface is hummocky or gently rolling, and the drainage is prevailingly good.

On account of its small extent, this type is not important in the agriculture of the county. It is a strong soil, however, and all of it is under cultivation to corn, cotton, peanuts, wheat, and oats. On the State Prison Farm 200 or 300 cattle and several hundred hogs are maintained on this soil. Corn yields 25 to 50 bushels per acre, cotton an average of 1 bale, peanuts 15 to 60 bushels, wheat 10 to 20 bushels, and oats 25 to 40 bushels.

Cotton is fertilized mainly with a home mixture of 100 pounds of cottonseed meal, 100 pounds of tankage, and 200 pounds of acid phosphate. This is applied at the rate of 400 pounds per acre. Some farmers use 8–4–4, 8–4–2, and 8–4–0 fertilizers, at the rate of 200 to 600 pounds per acre, followed by top dressings of nitrate of soda at the rate of 50 to 150 pounds per acre. As a rule corn is not fertilized, but on some farms 100 pounds of nitrate of soda per acre is given as a top dressing. This soil can be improved in productiveness by the methods suggested for the Wickham fine sandy loam.

Land of this type owned by private individuals is valued at $20 to $100 an acre.

In the table below are given the results of mechanical analyses of samples of the soil and subsoil of the Wickham very fine sandy loam:

Mechanical analyses of Wickham very fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
234117	Soil	1.2	2.5	2.4	23.6	35.9	25.5	8.8
234117a	Subsoil	.0	.4	.7	9.2	18.0	32.5	39.2

ALTAVISTA VERY FINE SANDY LOAM.

The Altavista very fine sandy loam consists of 6 to 10 inches of gray very fine sandy loam, underlain by yellow, friable clay or silty clay which contains an appreciable quantity of fine mica flakes and sometimes shows gray mottlings below a depth of 30 inches. There are included with the type many small areas of Altavista fine sandy loam, Altavista loam, Wickham fine sandy loam, Wickham very fine sandy loam, and Roanoke loam.

The most important areas of Altavista very fine sandy loam occur along the Kinston-Weldon Branch of the Atlantic Coast Line Railroad between Tillery and Kitchins Siding. Numerous small areas are mapped between Pender and the State Prison Farm, and along Fishing Creek and Little Fishing Creek. The type mainly occupies flat or gently undulating positions. Some of the smaller areas occur in basins. Owing to the lack of surface relief and to the heavy, compact structure of the soil and subsoil, the natural drainage is poorly developed. Between Tillery and Chestnut Grove Church the surface material is a fine sandy loam, and the soil is better drained than elsewhere.

This is not an important agricultural soil. Only about 10 to 15 per cent of it is cultivated, the remainder being forested with oak, black gum, sweet gum, hickory, elm, maple, pine, and locust. The cleared areas are used mainly for the production of cotton, corn, and peanuts. Cotton yields one-fourth to three-fourths bale per acre, corn 10 to 25 bushels, and peanuts 15 to 50 bushels. The soil is fertilized in about the same way as the adjoining types.

Land of the Altavista very fine sandy loam ranges in price from $10 to $50 an acre. The higher prices are asked in the vicinity of Tillery.

A large percentage of this type requires artificial drainage before it can be brought into cultivation. On account of the poor drainage and the compact structure, the soil has a tendency to pack and harden, and it would be greatly benefited by the turning under of vegetable matter, deep plowing, and liberal applications of lime.

In the table below are given the results of mechanical analyses of samples of the soil and subsoil of the Altavista very fine sandy loam:

Mechanical analyses of Altavista very fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
234104	Soil	0.4	1.0	0.9	29.0	42.2	20.4	6.2
234104a	Subsoil	.2	.2	.4	12.4	20.8	25.8	40.4

ROANOKE LOAM.

The Roanoke loam consists of about 6 to 10 inches of gray to dark-gray loam, underlain to a depth of 36 inches or more by mottled gray, yellow, and red plastic, impervious clay. Where the type grades into the Altavista very fine sandy loam the surface 6 or 8 inches of gray loam is usually underlain to a depth of 12 to 15 inches by a yellowish-gray very fine sandy loam or silty loam. In places the subsoil is mottled red, gray, and yellow, with brown spots in the lower part. There are included with the type a few small areas of Altavista very fine sandy loam.

The Roanoke loam is developed in areas of considerable extent on the terraces of the Roanoke River and Fishing Creek. The most important areas are mapped near Little Zion Church, 2½ miles east of Chestnut Grove Church, and along the east side of Kehukee Swamp from Kitchins Siding to Whites Mill. Many smaller developments occur in the vicinity of Coffields Bridge. Owing to the flat surface and the impervious subsoil, this is one of the most poorly drained types in the county, and water stands on the surface for long periods after rains. This soil occupies part of the poorly drained area known as "The Slashes," about 4 miles southeast of Halifax.

Practically none of the Roanoke loam is under cultivation. It is forested with willow oak, water oak, white oak, pine, maple, ash, elm, hickory, and dogwood. The agricultural value of the type is low, and it is valued mainly for the timber growth. Owing to the impervious nature of the subsoil the establishing of good drainage would be difficult. The soil if reclaimed would produce good grass for pasture, and would probably give good yields of corn and oats.

In the following table are given the results of mechanical analyses of samples of the soil and subsoil of the Roanoke loam:

Mechanical analyses of Roanoke loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
234113	Soil	0.1	0.4	0.9	18.9	20.8	39.1	20.1
234113a	Subsoil	.0	.2	.4	11.0	13.6	27.0	47.9

TOXAWAY CLAY LOAM.

The Toxaway clay loam consists of 6 to 10 inches of dark-brown to black clay loam resting on bluish-gray, stiff, plastic clay. In some places the surface material is a dark-gray clay loam carrying a small percentage of fine sand. There are included with the type, as mapped, several narrow strips of Toxaway silty clay loam and loam.

The Toxaway clay loam consists mainly of reworked Piedmont material. There is intermixed with this more or less Coastal Plain material which was deposited over the river terrace by streams issuing from the Coastal Plain. The typical Piedmont materials were deposited by the Roanoke River and Fishing Creek. Since their deposition the river has deepened its channel, leaving the sediments on terraces lying well above overflow level. Streams crossing these terraces have reworked part of the sediments as originally laid down, giving rise to the Toxaway clay loam. All the areas of this type are small. The largest occupy the first bottoms of small streams in the vicinity of Norfleet. A long, narrow strip occurs along Kehukee Swamp. Numerous small areas are encountered on the north side of Fishing Creek.

The surface is nearly flat, with only a gentle slope in the direction of stream flow. The greater part of the type is subject to inundations, and it is not important agriculturally. Many of the smaller areas are cleared but are used only for the production of natural hay and for grazing. With better drainage many areas of this soil would be valuable for corn.

CONGAREE FINE SANDY LOAM.

The Congaree fine sandy loam consists of 10 to 15 inches of reddish-brown or chocolate-brown fine sandy loam, underlain to a depth of 36 inches by a light reddish-brown or yellowish-brown fine sandy clay or loamy fine sand. Frequently strata of yellowish fine sand are encountered in the subsoil, and in a few places the subsoil is a dark brownish gray, loamy fine sand. There are included with the type a few small areas of Congaree sandy loam and some narrow strips of Congaree fine sand. Depressions occurring in the type are occupied by the Congaree silty clay loam.

The Congaree fine sandy loam occurs only in the first bottoms of the Roanoke River. The largest area is a narrow strip extending from the mouth of Deep Creek to Weldon. A smaller area occurs on the State Prison Farm. The surface of the type is characterized by low, flat ridges with intervening shallow depressions. All of it is inundated during periods of high water, but when the water level in the streams is normal the drainage is good.

There is only a small total area of this type, and it is of minor agricultural importance. It is used only for the production of corn, which yields 10 to 40 bushels per acre. No fertilizer is used. The selling value of the land is about the same as that of the Congaree silty clay loam.

CONGAREE SILTY CLAY LOAM.

The Congaree silty clay loam consists of a chocolate-brown to reddish-brown silty clay loam extending to a depth of 36 inches or more without much change in color, texture, or structure. There are

included with the type a few areas of Congaree fine sandy loam and silt loam too small to show separately on the soil map.

The Congaree silty clay loam is developed in the first bottoms of streams in the Piedmont section of the county, and in similar positions along the Roanoke River and Fishing Creek, which issue from the Piedmont. Along the smaller streams the areas of this soil vary in width from 50 yards to about one-fourth mile. The greater part of the type occurs along the Roanoke River and Fishing Creek. The surface is flat, with a gentle slope toward the stream and in the direction of flow. Throughout the type there occur many abandoned stream channels and deep, narrow gullies. It is inundated at every overflow of the streams, and on account of its heavy soil and subsoil it retains water for a long time. The greater part of the type requires artificial drainage before it can be successfully used for agriculture. On the State Prison Farm a large area has been reclaimed by the construction of canals and a levee.

The Congaree silty clay loam is inherently the most productive soil in the county, but on account of its liability to overflow only a small part of it is under cultivation. The forested areas support a mixed growth consisting of sweet gum, black gum, tupelo gum, cypress, red oak, white oak, willow oak, ironwood, willow, ash, elm, maple, poplar, holly, and hickory, with occasional buckeye and longleaf pine. At one time there was a valuable growth of merchantable timber, and in a few places this is still standing.

This soil is held in high esteem for corn, and where cultivated it is used almost exclusively for this crop. Yields range from 20 to 60 bushels per acre, without fertilization. Grasses make a luxuriant growth in cleared areas, and some land which was formerly cultivated is now used as pasture. The cattle consist largely of scrub stock, but there are a few herds of pure-bred cattle, including Black Angus, Red Polled, Hereford, and Shorthorn.

On account of the heavy, compact nature of this type strong work stock and heavy plows are necessary in the preparation of the seed bed. It is practically impossible to do good breaking unless the soil is moist, and it is generally necessary to go over the field several times with disk harrows to work down the clods. In preparing the land for corn it is customary to throw it up in "beds" or "lands," on which either one or two rows of corn are planted. Corn usually receives two cultivations. Fertilizers are not used on this soil.

The selling value of land of the Congaree silty clay loam varies from $15 to $50 an acre.

This soil can be reclaimed only by cutting canals and building levees, and reclamation would involve such an enormous expense that it could not be accomplished by individual effort. With good drainage this would be one of the most valuable soils in North Carolina. In 1916 corn yielded an average of 40 bushels per acre on a tract of 1,000 acres on the State Prison Farm.

KALMIA FINE SANDY LOAM.

There is considerable variation in the soil and subsoil of the Kalmia fine sandy loam. The greater part of the type consists of 8 to 12 inches of gray fine sandy loam or loamy fine sand, passing into a light-gray or yellowish-gray fine sandy loam which extends to a depth of 15 to 30 inches. The typical subsoil is a yellow, friable fine sandy clay. In some places the soil to an average depth of about 28 inches is a mellow fine sand. In other places the subsurface layer is a nearly white fine sand or fine sandy loam, passing at about 20 inches into a light-gray fine sandy clay. The type as mapped includes small patches of Kalmia fine sand and sand, consisting of gray fine sand or sand underlain by yellow fine sand to a depth of 3 feet or more. The largest of the fine sand areas lie 1½ miles east of Pender, near Merritts Bridge, and to the south of that place.

The Kalmia fine sandy loam is the most extensive terrace soil of the Coastal Plain. It occurs in long, narrow strips bordering each side of Beech Swamp from Enfield to Fishing Creek, and along Quankey Creek from Pierces Church to the Roanoke River. Many areas occur along Marsh Swamp, on the outer margin of the Roanoke River terrace from Pender to Tillery, and south of Tillery nearly to Spring Hill. The areas on the river terrace are of colluvial origin, consisting of material carried to its present position by surface wash.

The surface of the Kalmia fine sandy loam is prevailingly flat, but relieved by low knolls and flat ridges. Where it adjoins the Ochlockonee loam and Congaree silty clay loam there is almost invariably a distinct escarpment. The elevation of the type above the Ochlockonee and Congaree soils ranges from about 2 to 15 feet. The terraces on which the Kalmia fine sandy loam occurs lie well above normal overflows, and their position tends to give the type good drainage. A few shallow depressions are drained by ditches, and in many places ditches have been cut to convey water from the uplands to local drainage ways.

Although the Kalmia fine sandy loam is not of large extent, it is of considerable agricultural importance. Probably 75 per cent of it is cleared and under cultivation. The timbered areas support a growth of pine, hickory, and various oaks, with scattered dogwood and persimmon trees. The principal crops grown are cotton, peanuts, and corn. Sweet potatoes, Irish potatoes, sorghum, and various garden vegetables are grown in patches for home consumption. Cotton

yields about one-third to 1 bale per acre, peanuts 15 to 40 bushels, and corn 12 to 35 bushels.

On account of the smooth surface of this soil and its prevailingly porous structure, it is easily tilled. It is handled mainly with light draft stock and with implements similar to those used on the most easily tilled soils of the county. The fertilizer practices do not differ materially from those on the adjoining soils. As a rule cotton is the most heavily fertilized crop. When complete mixtures are available it is usually given an acreage application of 300 to 1,000 pounds of an 8–2–2, 8–3–3, or 8–4–4 mixture. Peanuts usually follow cotton, and receive only an application of lime. Corn sometimes is given a light application of an 8–2–2 or 8–3–3 fertilizer. Some clover is grown, and when corn follows this crop it sometimes receives about 300 pounds of 16 per cent phosphoric acid per acre. The soil can be improved by the methods suggested for the Norfolk fine sandy loam.

The selling price of the land ranges from $15 to $50 an acre, averaging about $30.

MYATT VERY FINE SANDY LOAM.

The Myatt very fine sandy loam consists of a dark-gray very fine sandy loam, 6 to 10 inches deep, underlain by a mottled gray and yellow very fine sandy clay.

This soil occupies second bottoms or low terraces along Coastal Plain streams. It is typically developed in areas of considerable size along Beech Swamp, Deep Creek, in the southeastern part of the county, and along Fishing Creek. The type lies intermediate between the first bottoms and the second terraces. Its surface is prevailingly flat, and natural drainage is poorly established.

The Myatt very fine sandy loam is of little agricultural importance. Only a few small areas have been cleared. These are used chiefly for grazing. The native vegetation is similar to that on the Ochlockonee loam.

Better drainage is the principal need of this soil. Liming is necessary for best results.

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

Mechanical analyses of Myatt very fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
234110	Soil	0.2	0.6	1.6	26.6	30.4	26.0	14.5
234110a	Subsoil	.0	.6	1.8	30.0	30.4	23.4	13.6

OCHLOCKONEE LOAM.

The Ochlockonee loam, in its typical development, consists of a dark-gray to brownish loam, underlain at 8 to 12 inches by dark-gray fine sandy clay. There are, however, many variations in this type. In some places it consists of a gray, heavy loam, with a small percentage of fine sand, underlain by a subsoil of light-gray or drab, compact, friable fine sandy clay. In other localities the soil in the surface 6 to 10 inches is a chocolate-brown silty clay loam, streaked or mottled yellow with iron oxide, and the subsoil consists of a light-gray or whitish, medium sand saturated with water and underlain at any depth between 12 and 30 inches by a bluish-gray, tough, plastic clay, mottled with yellow. Along some streams the soil is typical Johnston clay loam, consisting of black clay loam underlain by a black clay, and would be mapped separately if more extensive.

The Ochlockonee loam occupies the first bottoms of Coastal Plain streams, and a large percentage of it is inundated throughout the greater part of the year. The surface of the broader areas is nearly level, or has only a gentle slope in the direction of stream flow. Some areas, largely those of black clay loam soil, have been reclaimed by deepening the stream channel, and are cultivated, but probably 95 per cent of the type is still in a swampy or semiswampy state, forested with cypress, tupelo, sweet gum, black gum, ash, willow oak, water oak, elm, maple, poplar, and holly.

The cleared areas are used almost exclusively for the production of corn. Some areas support a dense growth of reeds and grasses, and are considered valuable for grazing. Corn yields vary from 15 to 40 bushels per acre, averaging about 25 bushels. No fertilizer is used on this type.

Land of the Ochlockonee loam is generally sold in connection with the adjoining soils and its value varies accordingly.

SUMMARY.

Halifax County, area 711 square miles, or 455,040 acres, is situated in northeastern North Carolina, partly in the Piedmont Plateau and partly in the Coastal Plain. It comprises upland, terraces, and bottom-land areas. The topography varies from flat or undulating to steeply rolling and hilly. The Roanoke River and Fishing Creek, with tributaries reaching all parts of the county, form a well-established drainage system.

The population of the county in 1910 was 37,646. Weldon, Roanoke Rapids, Scotland Neck, Enfield, and Littleton are the largest towns. All the population is classed as rural.

Transportation facilities are afforded by several lines of railway. Norfolk, Richmond, Wilmington, Raleigh, and numerous other large

centers of population are within easy access. The county has a good public-road system, and this is generally being improved.

The climate of Halifax County is mild. There is a growing season of 195 days. The mean annual rainfall is 47.22 inches, which is well distributed throughout the year, being heaviest during the growing season and lightest in the fall.

The agriculture of the county consists of the production of both income and subsistence crops. The income crops are mainly cotton, peanuts, and tobacco. Corn is the most important subsistence crop. Meat, dairy products, fruits, and garden vegetables are produced for home consumption and for sale on the local markets.

The farms operated by owners are usually well equipped with buildings and implements. Crop rotations are followed to some extent by practically all the farmers. Fertilizers are in general use on all soils except the Congaree types of the bottom lands. The farm laborers are mainly colored. Farm land ranges in price from $10 to $125 an acre.

The soils of the county may be grouped broadly into residual, sedimentary, and alluvial soils. The residual soils occupy the Piedmont section, and belong to the Cecil, Appling, Durham, Georgeville, and Alamance series. The sedimentary soils, occurring only in the Coastal Plain section, have been classified with the Orangeburg, Ruston, Norfolk, Coxville, and Portsmouth series. A small area occupied by mixed sedimentary and residual materials is mapped as Bradley soils. The alluvial soils include both terrace and first-bottom types. Where derived from reworked Piedmont material the terrace soils are grouped with the Wickham, Altavista, and Roanoke series, and the first-bottom soils with the Toxaway and Congaree series. Where derived from reworked Coastal Plain materials the terrace soils are classified with the Kalmia and Myatt series and the first-bottom soils with the Ochlockonee series.

Farming is not as well developed in the Piedmont section of the county as in the Coastal Plain uplands and on the stream terraces, but a considerable proportion of the Cecil, Appling, and Durham soils is under cultivation. These soils are prevailingly low in organic matter. They are easily tilled. Cotton and corn are the principal crops. The Cecil sandy loam is the most extensive of the Piedmont soils. Peanuts are an important crop on this type.

The Piedmont soils of the Georgeville and Alamance series, derived from slates, are not well developed agriculturally. They occur mainly in small areas in the western part of the county. The Alamance very fine sandy loam is in general poorly drained.

The Bradley sandy loam is a very inextensive soil. About 20 per cent of it is cultivated, principally to cotton, corn, and peanuts.

The Orangeburg, Ruston, and Norfolk are the most important of the Coastal Plain soils. The Orangeburg sandy loam is not extensive, but it is a rolling, easily tilled, productive soil, and about 60 per cent of it is cropped. The Ruston soils also are desirable general-farming types. The Norfolk sand does not give good yields unless heavily fertilized and favored with considerable rainfall, but the Norfolk soils in general are productive types. The fine sandy loam dominates the agriculture of the Coastal Plain section, and is the highest priced soil in the county. Cotton, peanuts, corn, cowpeas, and tobacco are the principal crops on the Coastal Plain types.

The Coxville and Portsmouth soils occur in small, widely distributed areas throughout the Coastal Plain uplands. They are poorly drained and are farmed to only a small extent.

The soils of the stream terraces are in general very productive and highly developed. The Wickham is the most extensive terrace series. Practically the entire area of the three Wickham soils and about 75 per cent of the extensive Kalmia fine sandy loam are under cultivation. Cotton, peanuts, and corn are the principal crops on these soils. The Altavista, Roanoke, and Myatt are poorly drained terrace soils, and only a small proportion of their area is cropped.

The first-bottom soils are mainly subject to prolonged inundations, and they are used principally for grazing. Practically none of the Toxaway clay loam is cropped, and the Congaree fine sandy loam and Ochlockonee loam are cultivated only to corn. The Congaree silty clay loam is held is high esteem for corn, and it is inherently the most productive soil in the county.

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[PUBLIC RESOLUTION—No. 9.]

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

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

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

Approved March 14, 1904.

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

Areas surveyed in North Carolina.

