

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.

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SOIL SURVEY OF VANCE COUNTY,  
NORTH CAROLINA.

BY

S. O. PERKINS, OF THE U. S. DEPARTMENT OF AGRICULTURE,  
IN CHARGE, AND W. A. DAVIS, OF THE NORTH  
CAROLINA DEPARTMENT OF AGRICULTURE.

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W. EDWARD HEARN, INSPECTOR, SOUTHERN DIVISION.

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[Advance Sheets—Field Operations of the Bureau of Soils, 1918.]



WASHINGTON:  
GOVERNMENT PRINTING OFFICE.

1921

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## LETTER OF TRANSMITTAL.

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U. S. DEPARTMENT OF AGRICULTURE,  
BUREAU OF SOILS,  
*Washington, D. C., June 11, 1920.*

SIR: I have the honor to transmit herewith the manuscript report and map covering the survey of Vance County, North Carolina, and to recommend that they be published as advance sheets of Field Operations of the Bureau of Soils, 1918, as authorized by law. This work was done in cooperation with the North Carolina Department of Agriculture.

Respectfully,

MILTON WHITNEY,  
*Chief of Bureau.*

HON. E. T. MEREDITH,  
*Secretary of Agriculture.*

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Soil map, Vance County sheet, North Carolina.	
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# SOIL SURVEY OF VANCE COUNTY, NORTH CAROLINA.

By S. O. PERKINS, of the U. S. Department of Agriculture, In Charge, and W. A. DAVIS, of the North Carolina Department of Agriculture.—Area Inspected by W. EDWARD HEARN.

## DESCRIPTION OF THE AREA.

Vance County lies in the northern part of North Carolina, about 32 miles north of Raleigh. It is bounded on the north by the Virginia line. The county is almost rectangular, with a maximum length from north to south of 26 miles, and a width from east to west of 13 miles. It has an area of 267 square miles, or 170,880 acres.

Vance County lies wholly within the Piedmont Plateau province. The topography ranges from nearly level to rolling, hilly, and broken. The interstream areas are nearly level to gently rolling, becoming more hilly and broken as the streams are approached. The smoothest areas are found along the main line of the Seaboard Air Line Railway from Gill to the Warren County line, along the Southern Railway from Henderson to the Granville County line, in the vicinity of Gillburg, Epsom, and Townsville; along the road from Gill to Bobbitt, and north of Drewry along the Warren County line.

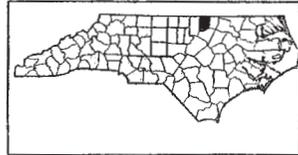


FIG. 1.—Sketch map showing location of the Vance County area, North Carolina.

Many of the interstream areas lie especially well for farming, as nearly all the slopes are well rounded. The most noticeable among the gently rolling to rolling areas is the broad divide extending from the Warren County line through Henderson, followed by the Seaboard Air Line Railway, thence continuing in a westerly direction via Dabney to the Granville County line, this part being traversed by the Southern Railroad. From Williamsboro along the road through Townsville, Rock Springs Church, and Tabernacle Church to the Virginia State line there is an uninterrupted ridge. Others occur between Brookston and Coleys Crossroads, north of the Seaboard Air Line Railway, east of Nutbush Creek, and from Williamsboro west to the Granville County line. Most of the steep, hilly, and broken areas are found along Tar River; Kings, Buffalo, Long, Tabbs, and Ruin Creeks; Little Ruin Branch; and along Nutbush Creek and Island Creek on the northwestern boundary of the county.

According to records of the Seaboard Air Line Railway, Middleburg is 480 feet above sea level, Henderson 505 feet, and Kittrell 410 feet.

Vance County is well drained through a number of creeks flowing into the Roanoke River on the north and Tar River on the south. The divide between these streams enters the county near Middleburg and extends in a southwesterly direction to Henderson, and thence in a northwesterly direction along the Southern Railroad to the Granville County line. Small drainage ways ramify the county, and reach every farm. All the creeks are fairly swift flowing and have cut valleys 50 to 200 feet below the general level of the county. Water power is developed for a few roller and grist mills.

Vance County was formed in 1881. The early settlers in this region were mainly English. The population is quite uniformly distributed over the county, the thinly settled sections being confined to the slopes along the streams, where the land is steep and unsuited to agriculture.

The rural population of the county in 1910 is reported by the census as 14,922, and the urban population as 4,503. The density of the rural population is 53.5 persons to the square mile. There are, nevertheless, many tracts of undeveloped land throughout the county. Henderson, the county seat, situated near the center of the county, had a population of 4,503 in 1910. It is the largest town in the county, and the chief trading point for tobacco and cotton. The population of Kittrell in 1910 was 242, of Townsville 166, and of Middleburg 117.<sup>1</sup>

Vance County is traversed by the main line of the Seaboard Air Line Railway, the Durham & Henderson Branch of that system, the Durham, Oxford & Henderson Branch of the Southern Railroad, and by the Roanoke River Railroad from Townsville, connecting with the main line of the Seaboard Air Line Railway at Manson.

The main public roads, which reach almost every section of the county, are graded and kept in good condition. The highway from Raleigh to Richmond follows the main line of the Seaboard Air Line Railway across the county. There are good roads from Henderson to Townsville, Oxford, Louisburg, and Warrenton, N. C., and to Clarksville, Va. Much interest has been aroused in road improvement in recent years. Every section of the county is reached by rural mail delivery routes. Good schools and churches are distributed throughout the county.

Henderson is an excellent market for all farm products, especially for tobacco and cotton. Kittrell, Middleburg, Townsville, and Dab-

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<sup>1</sup> Since this report was written the preliminary announcement of the population of Vance County and its civil divisions in 1920 has been issued by the Bureau of the Census, as follows: Vance County, 22,799; urban, 5,222; rural, 17,577; Henderson, 5,222; Kittrell, 223; Middleburg, 104; Townsville, 206.

ney are local markets for truck crops, poultry, eggs, vegetables, fruits, berries, pork, and beef.

## CLIMATE.

The climate of Vance County is well suited to general farming and the growing of late truck crops. The summers are not too hot, and the winters are not severe. According to the records of the Weather Bureau station at Henderson, the extreme range in temperature is 106°, or from -2° to 104° F., and the mean annual temperature is 58.7° F. The rainfall, averaging 48.5 inches, is well distributed throughout the year. The heaviest precipitation occurs in the summer and the lightest in the fall.

The average date of the last killing frost in the spring, as recorded at the same station, is April 6, and that of the first in the fall, October 31. This gives an average growing season of 208 days, which is adequate for maturing many different crops. The earliest killing frost in the fall occurred on October 10, and the latest in the spring, on April 24.

The following table, compiled from the records of the Weather Bureau station at Henderson, gives in detail the normal monthly, seasonal, and annual temperature and precipitation for the county:

*Normal monthly, seasonal, and annual temperature and precipitation at Henderson.*

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year (1909).	Total amount for the wettest year (1901).
	° F.	° F.	° F.	Inches.	Inches.	Inches.
December.....	40.7	74	6	3.91	1.65	5.62
January.....	39.4	77	3	3.27	1.34	2.20
February.....	39.0	74	-2	4.28	2.89	.70
Winter.....	39.7	77	-2	11.46	5.88	8.52
March.....	50.3	92	18	4.37	2.27	4.69
April.....	57.1	98	26	3.95	2.74	6.10
May.....	67.8	98	37	3.87	2.79	8.37
Spring.....	58.4	98	18	12.19	7.80	19.16
June.....	74.5	100	43	4.46	7.42	3.86
July.....	78.0	101	55	5.45	4.99	6.40
August.....	76.7	104	53	5.52	6.87	9.22
Summer.....	76.4	104	43	15.43	19.28	19.48
September.....	71.4	103	40	3.42	2.53	7.84
October.....	59.6	92	28	3.34	1.22	3.40
November.....	49.3	80	17	2.64	.34	1.29
Fall.....	60.1	103	17	9.40	4.09	12.53
Year.....	58.7	104	-2	48.48	37.05	59.69

## AGRICULTURE.

Early agriculture in Vance County consisted of the growing of corn, wheat, oats, and rye. About 1850 the cultivation of tobacco was begun, and from 1850 to 1860 other crops were introduced. Hay, flax, beans, peas, pumpkins, and many varieties of fruits and vegetables were grown for home use. The type of tobacco grown at first was dark and heavy. The greater part of the surplus crop was sold in Petersburg and Richmond, and as there was no railroad it was rolled to these markets in hogsheads. In the early days more wheat, corn, and oats were grown, and hogs, cattle, sheep, and work stock were raised in large numbers.

Tobacco rapidly assumed the place of first importance, and its production has gradually increased to the present time. With the increase in the production of tobacco there has been a decrease in the growing of grain, and a corresponding decrease in the number of cattle, hogs, and sheep raised. Cotton ranks second and corn third in importance.

In 1889, according to the census, there were 1,979,070 pounds of tobacco produced; 181,144 bushels of corn; 1,281 bales of cotton; 34,408 bushels of oats; 24,713 bushels of wheat; and 33,247 bushels of sweet potatoes.

The following table gives the acreage of the principal crops at the last three census periods:

*Acreage of principal crops, 1889 to 1909.*

Crop.	1889	1899	1909
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Corn.....	17,895	17,939	16,276
Oats.....	4,842	1,662	384
Wheat.....	3,048	2,099	1,096
Tobacco.....	4,979	6,554	6,629
Cotton.....	6,787	6,024	6,879

The agriculture of Vance County at present consists of the production of tobacco and cotton as cash crops, and of corn together with some oats and wheat as the main subsistence crops. Tobacco is the most important cash crop. Its acreage has been doubled and possibly trebled since 1909, in which year the production was 3,854,390 pounds. Approximately 8,000,000 pounds were produced in 1918. All of the crop is artificially cured and used chiefly in the manufacture of pipe, cigarette, and chewing tobaccos.

Cotton is also a cash crop, but its value is far below that of tobacco, and it occupies at present a smaller acreage, though in 1909 the

acreage slightly exceeded that in tobacco. Approximately 5,000 bales were produced in 1918.

Corn occupies a larger acreage than any other crop in the county. It is grown to supply meal for human consumption and as feed for work stock and hogs. The production is never sufficient to meet the local demands, and much corn is shipped in each year.

Considerable wheat, oats, cowpeas, and sweet potatoes are grown for home consumption. Hay is not an important crop, large quantities being shipped into the county annually. The farmers consider it more profitable to devote their time to the production of tobacco, and to buy their corn, hay, and flour.

Every farmer raises hogs, mostly to supply the home demand for meat, although a surplus is sold on the local markets. There were 5,920 hogs sold or slaughtered in 1909. In the same year 469 calves, 930 other cattle, and 121 sheep and goats were sold or slaughtered. A few small dairies furnish milk for the town of Henderson. All the farmers keep one or more cows to furnish milk and butter for home use, the local markets absorbing the relatively small surplus left after supplying the wants of the household. In 1909 a total of \$64,233 worth of dairy products were sold. Very few colts are raised in Vance County, and large numbers of mules and horses are shipped in each year.

Most of the farmers recognize the adaptation of various soils to the different crops. The Durham coarse sandy loam, sandy loam, and fine sandy loam, and the Appling coarse sandy loam, sandy loam, and fine sandy loam are recognized as the best tobacco soils. The Cecil sandy loam, fine sandy loam, and clay loam are considered the best soils for wheat, cotton, and corn. The Appling soils are recognized as well suited to cotton and corn. The Congaree silt loam is adapted to corn and grass, and is used for these crops almost entirely.

The better farms are improved with attractive, comfortable houses and large barns, and in general the farm buildings are adequate and kept in good condition. There are very few cattle barns or silos in the county, but the storage room is sufficient to accommodate the crops requiring protection and there is ordinarily shelter for the work stock. The equipment on the better improved farms consists of one and two horse turning plows, disk plows, disk harrows, cut-away harrows, mowing machines, harvesters, and riding and walking cultivators. A few large farms have tractors for plowing and for other farm work. Tobacco transplanters and corn shredders are used to some extent. The work stock consists of horses and mules.

Plowing is generally shallow, and is done mostly with one-horse turning plows. A very good seed bed can be made on the deep sandy

loam soils by the methods in use, but on the heavier soils the fields in many cases is not very well prepared.

No systematic crop rotation is followed by the farmers in this county. In the vicinity of Williamsboro and Pool Rock Farm wheat is succeeded by cowpeas and the latter by corn. Cowpeas or soy beans are usually planted between the hills in cornfields.

All the farmers of Vance County use commercial fertilizers, the total expenditure in 1909 amounting to \$105,803. Fertilizer is used for all the important crops. When potash was not so expensive, high-grade mixtures were used for tobacco, and applied at the rate of 500 to 1,000 pounds per acre. The fertilizers commonly used at present (1918) analyze 8-3-3,<sup>1</sup> 9-3-0, or 8-2-2, and home mixtures of acid phosphate and cottonseed meal are in common use. Cotton and corn never receive as heavy applications of fertilizer as tobacco. For some crops acid phosphate is used alone.

Farm labor is very scarce and high priced, and nearly every farmer depends more or less on his own family to do the farm work. Unskilled farm labor usually receives from \$1.75 to \$2.50 a day. Cotton pickers are paid \$1 to \$2 per 100 pounds of seed cotton. Laborers hired by the month are usually furnished a house and garden and paid \$30 to \$45 a month.

In 1910 there was a total of 2,021 farms in Vance County, ranging in size from a few acres to 1,000 acres. The average size of farms, with each tenancy classed as a farm, was 77.6 acres.

The percentage of farms operated by owners in 1910 is reported as 40.5 per cent, by tenants 59.2 per cent, and by managers 0.3 per cent. A share system of tenancy is generally followed, the landlord furnishing the implements and one-half the fertilizer, and receiving one-half the crop. When the tenant furnishes stock and implements and three-fourths of the fertilizer the landlord gets one-fourth of the crop. A few tenants rent land for a fixed cash price or for a specified amount of tobacco or cotton.

The selling value of farm land depends upon the nearness to towns and lines of transportation. Near Henderson the price ranges from \$50 to \$200 an acre, and near the smaller towns from \$35 to \$85 an acre, while land in certain parts of the county can be bought for \$10 to \$30 an acre. The highest priced land is found in the central, eastern, southeastern, and northern parts of the county. Land values are lowest in the northwestern part and around Williamsboro, where prices range from \$10 to \$30 an acre.

#### SOILS.

Vance County lies wholly within the Piedmont Plateau province and all the upland soils have been derived in place from the weather-

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<sup>1</sup> Respective percentages of phosphoric acid, nitrogen, and potash.

ing and decomposition of the underlying rocks. The principal rock formation, underlying by far the greater part of the county, is granite. The granite in this region is light colored, prevailingly coarse in texture, and composed primarily of quartz, feldspar, and mica. In the extreme northeastern part of the county there occurs some fine-textured granite, and in the southern part of the county and in a few other localities there is some gneiss.

Along the western side of the county, beginning near Flat Creek and extending in a northerly direction to the Virginia line, is a belt, 1 to 2 miles wide, underlain by slate. This rock belongs to the formation known as the "Carolina slates," which is extensively developed in the southern and central parts of the State. These rocks are fine textured and in their fresh condition are of light-gray color, but upon weathering and decomposing they show all colors from gray or pink to purple or red. In the central part of the county, about 3 miles northwest of Henderson, and in a few isolated areas elsewhere diorite rock occurs. This is a dark-colored or almost black, heavy, massive rock locally known as "nigger heads" and "iron" rock.

Since the rocks of the county vary widely in physical and chemical composition, the resulting soils range considerably in texture, color, and structure. The soil types having a common origin, color, and structure are grouped into series. The Cecil, Durham, Appling, Davidson, Iredell, Wilkes, Georgeville, and Alamance series include the upland soils, which are all of residual origin. In addition to these there are along the streams narrow strips of alluvial soils, formed from material washed from the uplands and deposited by the streams at times of overflow. The Roanoke and Congaree series and Meadow (Congaree material) include the alluvial soils.

The Cecil series is characterized by gray to red soils and bright-red, stiff, brittle clay subsoils. The members of this series are derived principally from granite and locally from gneiss.

The types included in the Durham series have light-gray surface soils and bright-yellow to deep-yellow, friable clay to sandy clay subsoils. They have been derived from light-colored granites.

The Appling series includes types with gray surface soils and reddish-yellow, light-red, or mottled yellow and red, stiff but friable clay subsoils. The subsoils are intermediate in color between the bright red of the Cecil on the one hand and the yellow of the Durham on the other. The Appling soils are derived from granites and gneiss.

The Davidson series differs from the Cecil in having dark-red surface soils and deep-red or maroon-red, smooth, compact clay subsoils. The members of this series have been derived from dark-colored basic rocks such as diorite and diabase.

The Iredell series is characterized by gray to grayish-brown surface soils and brownish-yellow or dingy-yellow, impervious, waxy clay subsoils, which are underlain at 24 to 36 inches by a rotten diorite rock from which the soil is derived.

The Wilkes series has a gray surface soil and a sandy clay to plastic subsoil. As mapped this series represents areas in which the soils of several series occur in areas so small that they could not be separated in detail. The Wilkes soils have been derived from a mixture of rocks such as diorite, aplitic granite, and gneiss.

The Georgeville and Alamance series are derived from slate. The members of the Georgeville series have grayish to red surface soils and red, brittle subsoils. The Alamance series differs from the Georgeville in that the surface soils are light gray to whitish, and the subsoils yellow.

The Roanoke series includes types with gray surface soils and mottled gray, drab, and yellow, tough, compact subsoils, developed on second bottoms or terraces, and poorly drained.

The Congaree series is characterized by brown surface soils and brown to light-brown subsoils. The members of this series occur in the first bottoms along streams. Only the silt loam is mapped in Vance County.

Meadow (Congaree material) is a miscellaneous type representing mixed soil material occurring in the first bottoms along streams.

The following table gives the name and the actual and relative extent of each type mapped in Vance County. Their distribution is shown on the accompanying map. The types are described in detail and their relation to agriculture discussed in the following pages of this report.

*Areas of different soils.*

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Appling sandy loam.....	34,368	20.1	Appling gravelly sandy loam.	3,584	2.1
Appling coarse sandy loam...	21,312	12.5	Cecil coarse sandy loam.....	3,136	1.8
Wilkes fine sandy loam.....	18,880	11.1	Congaree silt loam.....	3,072	1.8
Cecil sandy loam.....	15,104	8.8	Durham fine sandy loam.....	2,240	1.3
Cecil fine sandy loam.....	11,008	8.2	Alamance silt loam.....	2,112	1.2
Gravelly phase.....	3,136		Appling stony sandy loam...	2,048	1.2
Appling fine sandy loam.....	12,672	7.4	Iredell fine sandy loam.....	1,984	1.2
Durham sandy loam.....	11,968	7.0	Cecil stony sandy loam.....	1,088	0.6
Cecil clay loam.....	6,976	4.1	Roanoke silt loam.....	768	0.5
Georgeville silt loam.....	5,952	3.5	Davidson clay loam.....	704	0.4
Durham coarse sandy loam...	4,416	2.6			
Meadow (Congaree material)...	4,352	2.6	Total.....	170,880	.....

CECIL STONY SANDY LOAM.

The surface soil of the Cecil stony sandy loam consists of a gray to reddish-brown, medium sandy loam extending to a depth of 5 to

8 inches. There is scattered over the surface and intermixed with the soil a high percentage of angular fragments of quartz rock, ranging from 1 inch to 6 inches in diameter, and in a few places fragments of granite are mixed with the quartz. The subsoil is a red, stiff, brittle clay.

This type is of small extent. The largest area is situated in the northwestern part of the county. Small areas are scattered over the southwestern part, 1 mile northeast of Flint Hill School, and a few patches lie northwest of Townsville. The type is developed on steep slopes and on high knolls, and the drainage is good.

Little of the Cecil stony sandy loam is under cultivation, and most of it is in forest, consisting mainly of oak, hickory, poplar, and dogwood. The most important crops are cotton and corn, the former yielding one-fourth to one-half bale, and the latter 10 to 25 bushels per acre. About the same kind and amount of fertilizer is used as on the Cecil sandy loam. The land is sold in connection with areas of adjoining soils.

#### CECIL COARSE SANDY LOAM.

The Cecil coarse sandy loam, to a depth of about 4 to 10 inches, is a gray to brownish-gray coarse sandy loam. The subsoil is a red, stiff to moderately crumbly clay, extending to a depth of 3 feet or more, except in a few places, where it passes at 30 to 36 inches into the disintegrated granite rock. The subsoil is not quite so deep red as that of the other Cecil types. Eroded areas on some of the slopes are more nearly a salmon color or a brownish red. In many places the surface soil has been washed off, leaving exposed a red loam containing some coarse sand and gravel. Most of the type has small, angular quartz gravel scattered over the surface and mixed with the soil mass. Patches of Cecil gravelly loam and Appling gravelly sandy loam are included with the type as mapped.

The Cecil coarse sandy loam is not an extensive soil, and is of little agricultural importance. The largest areas are found in the northern part of the county. The type occurs mainly on the higher ridges and knolls, and is naturally well drained.

Most of the Cecil coarse sandy loam is under cultivation. The rest supports a forest of oak, pine, hickory, and dogwood. There are also considerable areas covered with old-field pine. Cotton, wheat, oats, and clover are the principal crops. Some tobacco is produced, as the type is closely associated with the Appling coarse sandy loam, an important tobacco soil. Cotton yields from one-third to 1 bale per acre, wheat 8 to 15 bushels, and oats 15 to 30 bushels.

The farming methods and the fertilizer practices are about the same as on the Appling coarse sandy loam. The type is held at about the same price as the Appling soil.

## CECIL SANDY LOAM.

The Cecil sandy loam, to a depth of 6 to 9 inches, consists of a yellowish-gray to brownish-gray mellow sandy loam. The subsoil is a red, stiff, brittle clay extending to a depth of several feet. In some places the surface soil is a brownish-gray to almost red sandy loam and in a few places mica flakes appear in the material of the lower subsoil. The steeper slopes include a few "gall spots," which would be mapped as Cecil clay loam if they were larger. In the vicinity of Williamsboro the surface soil is a brownish-gray loam to sandy loam, loose and hard to turn with the plow. Part of the type here is known as "dead land" or "push land," the unfavorable characteristic being most prominent where the type adjoins the Davidson clay loam. Angular quartz fragments are found on the surface nearly everywhere, but in too small amount to make the soil gravelly or stony.

The Cecil sandy loam occupies level to rolling interstream positions and rolling to steep slopes leading to the streams. The largest and smoothest areas occur on the Pool Rock Farm in the vicinity of Williamsboro, 2 miles west of Island Creek Church, and along the Granville County line in the southwestern part of the county. Gently rolling areas are found in the central-eastern part. Small areas of the type are scattered throughout the county. Owing to its high elevation, gently rolling topography, and open structure, the type has good natural drainage.

This soil is important for the production of grains and cotton, and much of it is under cultivation. The forested areas support a growth of white oak, red oak, black oak, post oak, hickory, dogwood, and maple, with some locust and persimmon. The leading crops are corn, cotton, wheat, clover, and oats. Corn yields from 15 to 50 bushels per acre, cotton one-fourth to 1 bale, wheat 10 to 20 bushels, and oats 20 to 30 bushels. Clover is generally turned under for soil improvement. Tobacco was grown on this type by the early settlers, and a small amount is still produced. All the general farm crops, with sweet potatoes, Irish potatoes, cowpeas, beans, peaches, apples, pears, and all kinds of vegetables do well on this type.

A few of the better farmers use lime on this soil. The fertilizers used are 9-3-0 or 8-2-2 preparations, or else a mixture of acid phosphate and cottonseed meal.

This land sells at \$20 to \$40 an acre, depending upon the state of improvement and its nearness to towns and transportation facilities.

The Cecil sandy loam is a desirable soil, especially suited for grains and cotton, and with liming and the growing of clover, cowpeas, and soy beans it can be brought to a high state of cultivation. Yet not much of the type has been improved.

## CECIL FINE SANDY LOAM.

The surface soil of the Cecil fine sandy loam is a yellowish-gray, light-brown, or reddish-brown, mellow fine sandy loam, with a depth of 5 to 10 inches. In the lighter-colored areas the soil usually has a depth of 8 to 10 inches, whereas the redder surface soil is commonly only 5 to 6 inches deep. The subsoil to a depth of 36 inches or more is a bright-red, stiff, brittle clay. Where this type grades into the Appling soils the subsoil is a light-red to yellowish-red, friable clay.

The Cecil fine sandy loam occurs in numerous areas well distributed over the county. Some of the more prominent areas are developed in the vicinity of Bullock Store, northeast of Williamsboro, east of Marrows Chapel, in the vicinity of the County Home, and along the Warren County line to the southeast of Middleburg.

The type has an undulating to gently rolling surface on the broader divides, and a rolling to hilly surface in belts along the streams. Its natural drainage is everywhere adequate.

About 65 per cent of this soil has been cleared, and is either cultivated or used for pasture. The forest growth on the rest consists mainly of oak and pine, with a sprinkling of dogwood, cedar, and poplar.

The principal crops on this type are wheat, cotton, and corn, followed by oats, peas, and clover. A heavy grade of tobacco is grown to some extent. Where the surface soil is deep, and has a gray top soil, good yields of tobacco are obtained. Wheat yields from 10 to 20 bushels per acre, cotton one-third to 1 bale, and corn 15 to 35 bushels. Sweet potatoes and sorghum are grown for home use. There are a few fruit trees on each farm.

The soil is mellow, and fairly easy to cultivate, but the plowing on this soil is generally shallow, and should be deeper for best results.

A few farmers have 2-horse plows. No systematic rotation is followed, but winter cover crops of rye or clover are grown by the better farmers. The fertilizer used for wheat and corn is either a mixture of acid phosphate and cottonseed meal, or an 8-2-2, 10-2-0, or 8-3-0 preparation. Applications range from 400 to 600 pounds per acre. Tobacco usually receives an acreage application of 600 to 1,000 pounds of an 8-3-3 or 8-2-2 fertilizer. When wheat and corn follow clover or rye 16 per cent acid phosphate is used as a fertilizer.

Land of the Cecil fine sandy loam ranges in selling value from \$20 to \$75 an acre.

*Cecil fine sandy loam, gravelly phase.*—The gravelly phase differs from the typical Cecil fine sandy loam in that there is present on the surface and mixed with the soil about 5 to 30 per cent of small angular quartz gravel. This does not interfere with cultivation,

but on the contrary appears to benefit the soil by rendering it more porous and less subject to surface washing.

This phase is developed in the southern part of the county, the largest areas lying along the main road passing Boydtown School and to the south of Joes Branch. It occupies ridges, and varies in topography from gently rolling to rolling. The natural drainage is everywhere good. In the extreme southern part of the county, and about 2 miles southwest of Henderson, a few small areas of Cecil gravelly sandy loam are included. Part of this latter soil is decidedly gravelly, and cultivation is carried on with difficulty. As a rule, the gravelly phase is devoted to the same crops as the typical Cecil fine sandy loam, and the yields are practically the same.

#### CECIL CLAY LOAM.

The surface soil of the Cecil clay loam is a red to reddish-brown clay loam extending to a depth of 4 to 8 inches where it rests upon a subsoil of bright-red, stiff, brittle clay which extends to a depth of 3 feet or more. Included in the type, as mapped, are small areas of Cecil fine sandy loam, sandy loam, and coarse sandy loam, and some variations of less degree occur. Thus, in places the soil for the first few inches is a fine sandy loam or sandy loam, and in others the soil is gravelly or stony. None of these departures from the typical were of sufficient importance to warrant separate mapping.

The Cecil clay loam is of small extent. It occurs in continuous strips bordering Island Creek, Little Island Creek, and Little Nut-bush Creek. Some smaller bodies are mapped along Flat and Nut-bush Creeks, and a few interstream areas occur about 2 miles west of Henderson, 1 mile northeast of Hicks Crossroads, and 1 mile east of Williamsboro.

The topography is gently rolling to rolling in the interstream areas, and hilly to steep on the slopes bordering the streams. All the type has good natural surface drainage.

A large part of the Cecil clay loam is in cultivation, and it is a strong, desirable soil. The native forest growth consists of oak, pine, dogwood, and hickory, with some locust, walnut, persimmon, and maple. The principal crops are cotton, corn, wheat, rye, and clover. Cotton yields one-fourth to 1 bale per acre, corn 10 to 40 bushels, and wheat 8 to 15 bushels. Red clover, crimson clover, soy beans, sorghum, apples, peaches, and pears are produced for home use.

Most of this type occurs in close association with the Cecil sandy loam and fine sandy loam, and it is handled with the same kind of work stock and implements. Practically the same fertilizers are used. The type can be built up to a high state of productiveness

by deeper plowing, by liming, growing clover or other legumes, and by rotating crops.

This land ranges widely in price, from \$15 to \$100 an acre, the prices varying with the character of the improvements and the situation of the particular tract with respect to the principal towns.

#### DURHAM COARSE SANDY LOAM.

The Durham coarse sandy loam to a depth of 5 to 8 inches consists of a gray, loose, porous, coarse loamy sand to light sandy loam, passing into a pale-yellow, rather coarse sandy loam which extends to a depth of 7 to 18 inches. The subsoil is a yellow, friable sandy clay, sometimes marked with pale-yellow or grayish spots.

The type occupies level to gently rolling interstream areas, becoming rolling on the slopes. Small areas are scattered throughout the county. The largest lie along the Granville County line 2 miles northeast of Watkins, three-fourths mile west of Rehoboth Church, in the vicinity of Union Church, and south of Dabney. Several areas are mapped in the northern part of the county, and smaller areas  $2\frac{1}{4}$  miles south of Henderson and one-half mile south of Bearpond.

This is an inextensive type, yet as it is closely associated with the Appling coarse sandy loam and Durham sandy loam, it is an important soil in some places, especially for tobacco. This crop and corn are the leading products. Peaches and strawberries are important special crops. There is a large peach orchard three-fourths mile north of Kittrell. Tobacco and corn give about the same yields as on the Durham sandy loam. The same methods of culture are followed and the same amounts and kinds of fertilizer are used as for the Durham sandy loam. The land of the two types sells at about the same price.

#### DURHAM SANDY LOAM.

The surface soil of the Durham sandy loam is a light-gray loamy sand or sandy loam passing at about 6 to 8 inches into a pale-yellow sandy loam. The subsoil begins at any depth from 10 to 18 inches, and consists of a yellow to deep-yellow, friable sandy clay to compact clay. In some places the lower part of the 3-foot section has faint-red mottlings, while in others the subsoil is heavy, tough, and mottled yellow and gray. There are included with the type small areas of Appling sandy loam, Durham coarse sandy loam, and Durham gravelly sandy loam. Another variation, occupying what was formerly a small natural pond lying about one-eighth mile north of Bearpond, consists of a dark-gray to black loam. This area supports a heavy forest growth.

The Durham sandy loam is confined mainly to the east-central and southeastern parts of the county. Other areas lie north of Herman Church, in the vicinity of St. Andrews Church and Dabney, and west of Watkins along the Granville County line.

The type occupies undulating to gently rolling interstream areas. It is the smoothest type in the county, and is well suited to the use of improved machinery. Owing to the sandy, porous surface soil and friable clay subsoil, the natural drainage is good.

Most of the type is under cultivation. The remainder supports a growth of oak, hickory, dogwood, and shortleaf pine, together with some persimmon and locust, but all the merchantable timber has been cut.

This soil is highly prized for the production of bright-leaf tobacco, and it is used chiefly for this purpose, though corn and rye are also important, the latter being grown as a cover crop and for hay. Garden vegetables, peaches, pears, grapes, and strawberries do well. A nursery at Kittrell, on this soil, is said to be among the largest shippers of strawberry plants in the country. Tobacco yields from 500 to 1,000 pounds per acre, and corn 10 to 30 bushels. Peanuts are produced to some extent and give good yields. The type is not used extensively for cotton, though the crop yields one-fourth to one-half bale per acre. The Durham sandy loam is not as good as the Appling soils for wheat, oats, or cotton, but it is undoubtedly better for bright-leaf tobacco; indeed the farmers recognize this type and the Appling sandy loam and Appling coarse sandy loam as the best tobacco soils in the county.

Shallow plowing and light cultivation are the general rule on the Durham sandy loam. It warms up early in the spring and permits early planting. The same methods of fertilization are followed as on the Appling sandy loam.

This land ranges widely in selling value, from \$20 to \$200 an acre, depending upon the nearness to towns, the state of improvement, and the transportation facilities.

A deficiency in organic matter has resulted from the continuous growing of tobacco, and organic matter and nitrogen should be supplied by growing and plowing under cowpeas, clover, soy beans, and rye. Tobacco following a leguminous crop, however, is never of a very good grade.

#### DURHAM FINE SANDY LOAM.

To a depth of 4 to 8 inches the Durham fine sandy loam consists of a light-gray to yellowish-gray fine to medium sandy loam. In a few places associated with the Cecil fine sandy loam, angular quartz gravel occurs on the surface. Underlying the surface soil is a pale-yellow, compact fine sandy loam, extending to about 15 inches. The

subsoil proper is a deep-yellow, friable fine sandy clay to compact clay. Mottlings of red sometimes appear in the lower part of the 3-foot section. Where the type is associated with the Wilkes fine sandy loam the lower subsoil is a tough, fairly plastic clay mottled with gray. In a few places the partly decomposed bedrock is encountered at 30 to 36 inches.

This type is of small extent. The largest area occurs north of Drewry along the Warren County line, near Watkins, and one-half mile south of Rehoboth Church. A few small areas are scattered over the northeastern and southwestern parts of the county. The type ranges in topography from undulating or gently rolling to rolling, and on the whole is well drained. The smoothest area lies north of Drewry. Those near Watkins and south of Rehoboth Church comprise the most rolling topography in the county. Another rolling area lies one-half mile south of Bullock Store.

Much of the Durham fine sandy loam is cultivated, while the rest supports a growth of white oak, black oak, post oak, hickory, and dogwood, with some old-field pine. The most important crops are tobacco, corn, wheat, clover, and cowpeas. Potatoes and all kinds of garden vegetables are raised for home use. This soil is held in high esteem for the production of bright tobacco, which yields 500 to 1,000 pounds per acre. Corn yields 10 to 40 bushels per acre, and wheat 8 to 12 bushels. The soil is generally deficient in humus, and the yields can be increased by plowing more deeply and by turning under pea vines, soy beans, and other green manures.

The selling value of the Durham fine sandy loam is about the same as that of the Appling fine sandy loam.

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

*Mechanical analyses of Durham fine sandy loam.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
235325.....	Soil.....	3.0	11.2	7.3	36.0	18.1	18.4	5.8
235326.....	Subsoil.....	3.4	10.2	7.2	32.0	18.0	19.8	9.3
235327.....	Lower subsoil.	2.2	7.4	5.2	23.4	12.6	14.6	34.4

**APPLING STONY SANDY LOAM.**

Except for its stoniness, the Appling stony sandy loam is practically identical with the Appling sandy loam in composition. It represents areas of more recently disintegrated granite rock, with stones scattered over the surface and throughout the soil and sub-

soil. In some places rock outcrops cover the surface, and here and there the surface is covered with weathered granite gravel.

Areas of this soil occur mainly along the breaks near streams, the largest being mapped along Buffalo Creek just east of Kittrell and along Sandy Creek. Small areas are scattered over the southern part of the county. The topography ranges from rolling to hilly and rough, and drainage is excessive except in a few gently rolling to rolling areas lying away from the streams.

Where the soil is not too stony and the granite rock does not lie too near the surface small areas of the Appling stony sandy loam are cultivated. Tobacco, corn, and cotton give fair yields, but the soil is not an important farming type, and is valued almost entirely for its forest products and for use as pasture. Oak, pine, hickory, and dogwood, with some cedar, locust, and old-field pine, form the forest growth.

#### APPLING GRAVELLY SANDY LOAM.

The Appling gravelly sandy loam is similar to the Appling sandy loam, except that it contains from 10 to 40 per cent of gravel, mainly quartz, with some small granite fragments. It is of small extent, being confined to patches scattered over the southern and western parts of the county. The largest areas are mapped just west of Boydtown School, about 1 mile southeast of Dabney, and 1 and 2 miles south of Hicks Crossroads. The type is also developed about  $1\frac{1}{2}$  miles northeast of Epsom and one-half mile southeast of Sandy Creek Church.

The topography ranges from gently rolling or rolling to hilly, and drainage is well established. About 60 per cent of the type is cultivated, cotton, corn, and tobacco, together with some cowpeas and soy beans, being the principal crops. Cotton yields from one-third to 1 bale, corn 15 to 30 bushels, and tobacco from 400 to 800 pounds per acre. The same kinds of fertilizer and like applications are used as on the Appling sandy loam.

Areas of the Appling gravelly sandy loam sell at \$10 to \$40 an acre.

#### APPLING SANDY LOAM.

The surface soil of the Appling coarse sandy loam is a gray, mel-low, coarse sandy loam or loamy coarse sand, 4 to 8 inches deep, carrying a little fine gravel. This layer passes into a pale-yellow coarse sandy loam, which extends to depths between 7 and 18 inches. The subsoil is prevailingly a yellowish-red to mottled red and yellow, heavy, but friable coarse sandy clay. In general, it is intermediate in color between the red of the Cecil and the yellow of the Durham. Mottling is particularly conspicuous in the substratum

at depths of 3 to 5 feet. Near the base of slopes the type usually has a deeper surface soil, owing to the washing down of sediments during rains. In a few places the areas of this soil are cut by granite outcrops.

The Appling coarse sandy loam occurs in close association with the Durham and Cecil coarse sandy loams, and as mapped includes small spots of each. It is confined mainly to the northern and southern extremities of the county. The most important areas lie near Rock Springs Church along the Virginia line, near Bobbitt, and from Gill to the Tar River. The type is prevailingly gently rolling to rolling, but some of the broader interstream areas are fairly level, and on the slopes near streams the type is strongly rolling or steep. With the favorable topography and loose structure of the soil material good drainage is assured.

About 50 per cent of the Appling coarse sandy loam is under cultivation. The other half supports a forest growth of white oak, red oak, post oak, black oak, hickory, poplar, cedar, locust, dogwood, and shortleaf pine. Most of the type lies in a fairly well developed part of the county. In the vicinity of Rock Springs Church this soil is prized very highly for growing bright-leaf tobacco, the leaf having more body than that produced on the Durham coarse sandy loam. It is not so good for wheat, corn, oats, and cotton as the Cecil soils, but is stronger than the Durham sandy loam. With an acreage application of 800 to 1,000 pounds of an 8-3-2 or 8-2-2 fertilizer, tobacco yields 500 to 1,200 pounds per acre. When 300 to 600 pounds of an 8-2-2 or 10-4-0 mixture is used, cotton yields one-fourth to 1 bale per acre and wheat 8 to 15 bushels. Corn is customarily fertilized with 300 to 500 pounds of a mixture of acid phosphate and cottonseed meal, analyzing about 10-3-0, and yields 20 to 40 bushels per acre. Usually a top dressing of nitrate of soda is made at an early stage in the growth, at the rate of 100 pounds per acre. Sweet potatoes, peanuts, and truck crops give good yields, and apples, peaches, and grapes are successful.

The Appling coarse sandy loam in the vicinity of Townsville sells for as much as \$75 an acre. In poorly developed localities the price ranges from \$20 to \$40 an acre.

This type is deficient in nitrogen and liberal additions of organic matter should be made. Deeper plowing and the growing of leguminous crops will greatly aid in bringing the land to a high state of productiveness. This is naturally a good general purpose soil.

#### APPLING SANDY LOAM.

The surface soil of the Appling sandy loam is a light-gray sandy loam, passing at 5 to 9 inches into a gray to yellowish-gray sandy

loam, which extends to about 18 inches. The subsoil is a stiff but friable clay, reddish yellow, yellowish red, or mottled or streaked with yellow and red. In a few places, usually on the steeper slopes, where surface wash has taken place, "gall spots" of pale-red or salmon-red loam occur, while in other places the yellowish-red or salmon-red subsoil immediately underlies the gray surface soil. Included with the type are small areas of Appling coarse sandy loam, Appling gravelly sandy loam, Cecil sandy loam, and Durham sandy loam.

The Appling sandy loam occurs mainly in the east-central and southeastern parts of the county and in the vicinity of Townsville,  $2\frac{1}{2}$  miles southeast of Rock Springs Church, and 1 mile northwest of Zion Holy Church. Small areas are scattered throughout the county.

The topography ranges from undulating or gently rolling in the broader interstream situations to rolling and even hilly and broken as the streams are approached. Owing to the sandy texture, loose, porous structure, and rolling topography, the soil is naturally well drained, and on a few of the steeper slopes the run-off is excessive.

This is one of the most important soils in the county, and a large proportion of it is under cultivation. The forested areas support a growth of oak, shortleaf pine, hickory, dogwood, and some locust, poplar, and persimmon. The type is used principally for the production of bright-leaf tobacco, cotton, corn, and sweet potatoes. The tobacco is not quite as bright as that produced on the Durham soils, but has more body and is of good grade. Tobacco yields 500 to 1,200 pounds per acre, cotton one-half to 1 bale, corn 12 to 35 bushels, and sweet potatoes, with the use of barnyard manure, from 125 to 350 bushels per acre. Garden vegetables, peaches, apples, and pears do well, and rye, cowpeas, and peanuts should be satisfactory crops.

Tobacco usually receives an acreage application of 500 to 1,000 pounds of an 8-2-2 or 8-3-3 mixture, and corn 400 to 600 pounds of a mixture of cottonseed meal and acid phosphate. Cotton is fertilized more heavily than corn, but with the same mixture.

Land values on this type have a wide range. Some areas bring only \$20 an acre, while near Henderson and between Henderson and Epsom the land sells for \$100 to \$200 an acre.

This soil is deficient in organic matter. Deeper plowing and the turning under of rye, cowpeas, and soy beans would be beneficial.

#### APPLING FINE SANDY LOAM.

The Appling fine sandy loam consists of a light-gray to yellowish-gray, mellow, fine to very fine sandy loam, 4 to 8 inches deep, underlain by a pale-yellow, rather compact fine sandy loam, which

extends to about 18 inches. The subsoil is a yellowish-red, reddish-yellow, or streaked yellow and red, friable fine sandy clay to rather heavy clay. In a few places the salmon-red or yellowish-red clay immediately underlies the top soil. In small areas on some of the steeper slopes the surface mantle has been washed off, leaving the salmon-red loam exposed. Small areas of Appling gravelly fine sandy loam, Durham fine sandy loam, and Cecil fine sandy loam are included in this type.

The Appling fine sandy loam occurs mainly in the northeastern part of the county. The largest area begins about 2 miles north of Middleburg and extends in a continuous body past Mount Pleasant Church to Flemings Mill. Other areas are mapped 1 mile north of Middleburg, a mile southwest of Flemings Mill, and just north of the mouth of Little Nutbush Creek. Smaller developments are scattered over the southwestern part of the county.

While this type in the interstream positions is nearly level or only gently rolling, it becomes hilly and steep on many of the slopes bordering streams. The fine sandy texture and mellow structure insure good natural drainage everywhere.

This is considered a desirable soil and much of it is under cultivation. The rest is forested with oak, hickory, dogwood, persimmon, and old-field pine, together with some locust and poplar. The principal crops grown are tobacco and corn. Tobacco yields 600 to 1,000 pounds per acre, corn 20 to 40 bushels, and cotton one-third to 1 bale. Vegetables, apples, peaches, and peanuts are grown for home use.

Most of the plowing is done with one-horse turning plows and it is usually shallow. Cowpeas and soy beans are seeded in the cornfields by the best farmers. Rye and crimson clover are grown after tobacco and cotton for green manuring and as hay crops, but to a limited extent. Tobacco is usually fertilized with 600 to 1,000 pounds per acre of an 8-2-2, 8-3-3, or 9-3-0 mixture; corn with 300 to 500 pounds of a mixture of acid phosphate and cottonseed meal; and cotton with 400 to 600 pounds of an 8-2-2 or 9-3-0 mixture. Some farmers use nitrate of soda as a top dressing, applying it to corn about the time it begins to tassel and to cotton when the bolls begin to form.

Land of the Appling fine sandy loam sells at \$15 to \$50 an acre

For best results this soil should be plowed deeper. It is deficient in organic matter, which can be supplied by growing cowpeas, rye, and crimson clover to be turned under.

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

*Mechanical analyses of Appling fine sandy loam.*

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
235308.....	Soil.....	1.0	2.0	3.4	37.8	32.7	18.8	4.4
235309.....	Subsoil.....	.5	1.7	2.6	27.6	28.9	27.3	11.5
235310.....	Lower sub-soil.	.4	1.4	1.8	15.4	17.4	24.6	39.4

## DAVIDSON CLAY LOAM.

The surface soil of the Davidson clay loam consists of 7 to 10 inches of reddish-brown or dark-brown to dark-red clay loam. The subsoil is a deep-red or maroon-red, stiff, smooth but friable clay, extending to a depth of 3 feet or more. In some places the surface material contains a small percentage of fine quartz sand. A few eroded patches in which the top soil consists of red clay are included in the type as mapped.

This is an inextensive soil, for it is confined to three small areas. The largest one lies on the west side of Nutbush Creek just north of the mouth of Flat Creek,  $2\frac{1}{2}$  miles east of Williamsboro. Another area occurs near the mouth of Crooked Run, and a third is mapped 1 mile north of Island Creek Church. The type lies on slopes and at the base of hills. It has a gently rolling to rolling surface, and is well drained. In a few places the top soil has been washed off, leaving the red clay exposed.

This is a desirable soil, and about 70 per cent of its area is under cultivation. The remainder supports a forest growth of oak, cedar, and old-field pine, together with some dogwood and hickory. Wheat, corn, and oats are the most important crops, followed by cotton and clover. Wheat yields 8 to 20 bushels per acre, corn 10 to 40 bushels, oats 15 to 25 bushels, and cotton one-third to three-fourths bale. Crops are fertilized with a mixture of acid phosphate and cottonseed meal. Lime is applied to the soil by a few farmers.

Land of the Davidson clay loam has a selling value ranging from \$20 to \$40 an acre.

This soil at present is in a poor state of cultivation, but it could be improved and made an excellent soil for the production of wheat, corn, and clover, and also for alfalfa. The type would be benefited by liming.

## IREDELL FINE SANDY LOAM.

The surface soil of the Iredell fine sandy loam, locally called "pipe clay," "beeswax," or "blackjack-oak" land, is a gray to brownish-gray fine sandy loam, 5 to 8 inches deep, carrying on the surface a

few small, rounded iron concretions and angular quartz fragments. The subsoil is a brownish-yellow to drab, waxy, plastic clay, passing into the decomposed parent rock at a depth of 24 to 30 inches. In spots on the slopes the soil has been washed off, and the subsoil clay lies exposed. Where this has taken place it cracks and disintegrates into cubical fragments, and turns a dingy-brown or rusty-brown color.

Only one important area of Iredell fine sandy loam occurs in this county, about  $2\frac{1}{2}$  miles north of Henderson. Some small developments are encountered one-half mile northeast of Red Bud Church,  $1\frac{1}{2}$  miles east of Harris Crossroads, and one-half mile east of the mouth of Indian Creek, and a few small patches are scattered over the north-central part of the county. The type occupies undulating to rolling ridges and gentle to steep slopes. Surface drainage is fairly well developed over all the type except a few level or undulating tracts, but the impervious nature of the subsoil causes poor underdrainage.

About one-half the type is under cultivation, the rest supporting a forest growth of blackjack oak, white oak, post oak, hickory, and old-field pine. The crops raised are principally corn, tobacco, wheat, oats, cowpeas, and clover. Corn ranges in yield from 10 to 40 bushels per acre, tobacco from 400 to 700 pounds, wheat from 5 to 12 bushels, and oats from 15 to 25 bushels. Apples, peaches, pears, and vegetables are grown to some extent. The same kinds and amounts of fertilizer are used as on the Cecil clay loam. Land of the Iredell type sells at \$20 to \$40 an acre.

#### WILKES FINE SANDY LOAM.

The surface soil of the Wilkes fine sandy loam consists of 5 to 8 inches of yellowish-gray to brownish-gray, mellow fine sandy loam to sandy loam, passing into yellowish, brownish-yellow, or yellowish-red to mottled red and yellow sandy clay or fine sandy clay. This extends to a depth of 10 to 20 inches. The subsoil consists of a yellowish to brownish-yellow, plastic, sticky clay. In many places the upper subsoil is similar to that of the Appling or Durham series, while the lower is identical with the Iredell subsoils. The type ranges in texture from a fine sandy loam to a coarse sandy loam or even in some places to a gravelly sandy loam. It really represents a soil condition rather than a soil type, and comprises a mixed area of the Appling, Durham, and Iredell soils. Small spots of Cecil soil are also included in places.

The Wilkes fine sandy loam occupies the roughest areas in the county, the topography ranging from rolling to hilly, broken, and steep. It has excellent drainage, the run-off in many places being excessive. The subsoil where exposed to the air cracks and allows

rainwater to enter. This facilitates erosion and in many places the type is badly gullied.

Areas of this soil are confined mostly to broken plots near streams. The largest areas lie along Flat, Nutbush, Long, Tabbs, and Ruin Creeks. Other small areas occur along Buffalo and Little Nutbush Creeks. The smoother land lies just west of Antioch Church in the vicinity of Rehoboth Church, on a ridge between Flat Creek and Crooked Run, and 2 miles northeast of Harris Crossroads.

The native tree growth consists of oak, gum, persimmon, hickory, dogwood, and old-field pine. Only a small proportion, the smoother part, of the type is under cultivation, the principal crops being cotton, tobacco, corn, and wheat. Cotton yields one-fourth to three-fourths bale per acre, tobacco 400 to 1,000 pounds, corn 10 to 30 bushels, and wheat 8 to 15 bushels. From 400 to 1,000 pounds per acre of an 8-3-3 or 8-2-2 fertilizer is used for all the crops.

The better areas of the Wilkes fine sandy loam are valued at \$10 to \$40 an acre. The rougher areas are sold with the associated soils.

#### GEORGEVILLE SILT LOAM.

The Georgeville silt loam to a depth of 4 to 9 inches is yellowish-gray or salmon-colored silt loam, grading at 4 to 6 inches into a reddish-yellow, rather compact silt loam. The subsoil consists of a red compact silty loam, which in many places changes to a dull-red, brittle silty clay in the lower part of the 3-foot section. Scattered over the surface almost everywhere are slate fragments, quartz gravel, and a few boulders. Occasionally the surface soil is reddish yellow or reddish brown, and the subsoil a deep-red, brittle silty clay. In a few places around the heads of draws and on the steeper slopes approaching streams the surface soil has been washed off, leaving exposed a light-red, pinkish, or purplish silty clay.

A variation of this type consists of areas carrying an abundance of quartz and slate fragments scattered over the surface and distributed through the soil. Areas of this description occur in the northwestern part of the county, where they occupy chiefly rolling ridges and rolling to broken slopes. Practically all of these stony areas support a forest of oak, pine, hickory, dogwood, poplar, maple, cedar, and old-field pine, and the land is valued mainly for pasture and forest products.

The Georgeville silt loam is confined to the northwestern part of the county. A strip ranging in width from one-half mile to  $1\frac{1}{2}$  miles and about 7 miles long occurs south of Island Creek, and another area is mapped near the head of Flat Creek, 2 miles north of Dabney. Typically developed areas occur near Philadelphia Church, south of Marrows Chapel, and in the vicinity of Flint Hill School.

The interstream areas are gently rolling to rolling, but the surface becomes steeply rolling to broken as the streams are approached. Some of the slopes are eroded in places, but with proper care the soil is not susceptible to damaging erosion.

The forest growth on the Georgeville silt loam consists of white oak, black oak, red oak, hickory, dogwood, shortleaf pine, poplar, cedar, and old-field pine. Some merchantable timber is being cut, but most of it has already been removed. Parts of both the forested and cleared areas are in pasture. Only a very small percentage of the type is cultivated, the principal crops being corn, cotton, wheat, and tobacco. Cotton yields one-fourth to 1 bale per acre, corn 8 to 30 bushels, wheat 8 to 15 bushels, and tobacco 500 to 1,200 pounds. Tobacco usually receives an acreage application of 800 to 1,000 pounds of an 8-3-3 or 8-2-2 fertilizer. Wheat and corn are as a rule grown after clover, and fertilized with acid phosphate. The land is too often broken to shallow depths and the seed bed poorly prepared. Land of this type sells for \$10 to \$30 an acre.

#### ALAMANCE SILT LOAM.

The surface soil of the Alamance silt loam is a light-gray to white or yellow-gray, floury silt loam, grading at 4 to 6 inches into a pale-yellow silt loam which extends to a depth of 6 to 12 inches. The subsoil typically is a bright-yellow, compact but friable silty clay loam. The parent slate rock is usually encountered at 24 to 36 inches. In some places diorite is interbedded with the slate, and here the subsoil varies from typical in being more plastic and mottled with gray, brown, and red. The dry surface material in many places is nearly white, while in forested areas it is gray to dark gray. The subsoil is mottled with gray in depressions and in the poorly drained, flatter places, while red mottlings are common in the higher, better-drained spots. Most of the type has an abundance of slate and quartz stones and angular quartz gravel scattered over the surface, but there is not enough such coarse material to make the soil a gravelly type.

This soil is of small extent. It occurs almost entirely in one area along the Granville County line, beginning about 3 miles north of Dabney. Other areas are situated 1 mile north of Flint Hill School, south of Philadelphia Church, and one-half mile southeast of Marrows Chapel.

The Alamance silt loam has a nearly level to gently rolling or rolling topography. The more nearly level part of the type lies about 2 miles southwest of Hicks Crossroads. The run-off and sub-drainage are very good, except in a number of flats and swales at the heads of drainage ways.

Only a small percentage of the Alamance silt loam is in cultivation, the rest being forested with blackjack oak, hickory, white oak, red

oak, post oak, old-field pine, cedar, and poplar. The crops grown are principally cotton, tobacco, wheat, corn, and oats. In the low, damp places considerable hay is produced. Cotton yields one-fourth to one-half bale per acre, wheat 5 to 12 bushels, corn 10 to 35 bushels, and oats 12 to 20 bushels. From 400 to 600 pounds per acre of a mixture of acid phosphate and cottonseed meal is used for cotton and corn. Tobacco receives 800 to 1,000 pounds of a commercial fertilizer, usually analyzing 8-2-2 or 8-3-3. The ordinary yield is from 500 to 900 pounds per acre. Yields of all the crops could be increased by incorporating organic matter in the soil, and by applying lime. This land sells for \$10 to \$30 an acre.

#### ROANOKE SILT LOAM.

The surface soil of the Roanoke silt loam, locally known as "crawfish land," is a gray, compact silt loam 6 to 10 inches deep. The subsoil is a mottled gray, drab, and yellow, heavy, and tough silty clay, which is frequently mottled with rusty brown. In a few places the surface soil is brown, as a result of overwash from the red uplands. Included with the type are a few patches of yellowish-gray fine sandy loam, underlain by yellow, compact fine sandy clay, which passes into the tough, mottled clay within the 3-foot section. This soil lies slightly higher than the typical Roanoke silt loam, and is better drained, and some of it is farmed. If it occurred in larger areas it would be mapped as Altavista fine sandy loam.

The Roanoke silt loam is developed in small strips, along Nutbush Creek, in the northern part of the county. One small area is mapped along Tabbs Creek, about one-half mile east of Antioch Church. The type occurs on the second bottoms, lying about 5 to 10 feet above the stream at normal stage. It is level and poorly drained, water standing on the surface in rainy seasons.

None of the typical Roanoke silt loam is under cultivation. The principal vegetation consists of water oak and scattered old-field pine. Much of the type has a stand of coarse grasses, which afford grazing for cattle during the spring and summer months. At one time part of this soil was drained and used in the production of corn, which gave good yields. If drained and protected from overflow it might be used profitably for growing corn, but its best use seems to be for the grazing of cattle.

#### CONGAREE SILT LOAM.

The Congaree silt loam consists of 7 to 14 inches of chocolate-brown or reddish-brown, friable silt loam, underlain by light-brown, compact silt loam or silty clay loam, extending to a depth of 3 feet or more. Both soil and subsoil contain a noticeable amount of small

mica scales, and along Tar River the proportion of finely divided mica is relatively large. Included with the type are a few areas of Congaree fine sandy loam and silty loam, too small to be shown on the map. Along the creeks and small streams where drainage is poor the surface soil is mottled with gray and brown and the subsoil with yellow and gray.

The Congaree silt loam is an alluvial soil, developed in the first bottoms of the Tar River, Tabbs, Ruin, Nutbush, Dodsons, Flat, Island, and Little Island Creeks. The largest areas occur along Nutbush and Tabbs Creeks.

The surface is level except for a gentle slope to the streams and in the direction of the flow. Owing to the flat surface and compact subsoil, the land is poorly drained, and artificial means are necessary to fit it for farming. It is subject to frequent overflows from the streams, which often damage crops, but the water does not remain long on the land.

If drained this would be an important type. It is reported that considerable corn was produced at one time, when the land was drained, but it has been allowed to revert to a forest condition, the growth consisting of birch, willow, sycamore, and water oak. Corn, hay, and oats are grown in many places, with good results. Corn yields 25 to 60 bushels per acre without fertilization, and hay about three-fourths ton per acre. The type is best suited for pasturage and for the production of corn. It is usually sold in connection with the adjoining uplands.

#### MEADOW (CONGAREE MATERIAL).

Meadow (Congaree material) has a wide range in color and texture. The soil is generally brown to reddish brown or red, but in places where it contains much organic matter it is almost black. In texture it varies from fine gravel to sand and silt. Some areas of Congaree silt loam, too small to separate, are included in the type. When the drainage is poor the subsoil is generally mottled dark brown and gray or bluish drab.

The surface of this type is not so uniformly flat and smooth as that of the Congaree silt loam. It is interrupted by depressions or low places washed out by the overflow of the streams, and by numerous small sandy ridges.

Meadow (Congaree material) is mainly alluvial, but some colluvial wash has been mixed with the original reworked material deposited by the streams. The type occurs in narrow strips in the first bottoms along the smaller streams. It supports a forest growth of willow, alder, and elm, with different kinds of briers. In some places an abundant growth of natural grasses affords good summer pasturage.

By deepening the channel of the creeks nearly all the type could be reclaimed and made to produce good crops of corn and oats.

#### SUMMARY.

Vance County is situated in the northern part of North Carolina, bordering the Virginia State line. It has an area of 267 square miles, or 170,880 acres. The topography ranges from flat to hilly and broken. The northern half of the county is drained through a number of creeks into the Roanoke River, and the southern half into the Tar River. Drainage is generally good throughout the county.

The population of Vance County in 1910 amounted to 19,425, of which 77 per cent, or 14,922, was rural. Henderson, the county seat, situated near the center of the county, is the largest town and the chief trading point for cotton and tobacco.<sup>2</sup>

Transportation facilities are good in the central and southern parts of the county. The main line of the Seaboard Air Line Railway traverses the area, and a branch of the Southern Railroad terminates at Henderson. The main public roads are good.

The county has a mild and healthful climate, well suited to a diversified agriculture. The rainfall is sufficient for crop growth and well distributed throughout the year. The mean annual precipitation is 48.48 inches, and the mean annual temperature 58.7° F.

Both income and subsistence crops are important in the agriculture of this county. The chief cash crops are tobacco and cotton. The most important subsistence crop is corn. Wheat, peanuts, fruits, dairy products, and garden truck are produced for home use and for sale on the local markets.

There is a wide range in the farm improvements in different parts of the county. Farms operated by owners are equipped with good buildings and implements, but many of the tenant holdings are not so well improved. No systematic crop rotation is followed by the farmers, and commercial fertilizers are depended upon to maintain yields.

The 1910 census reports a total of 2,021 farms in the county, with an average size of 77.6 acres. In that year 88 per cent of the area of the county was in farms and 47 per cent of the acreage in the average farm was improved.

Vance County lies wholly within the Piedmont Plateau province. All the upland soils are residual, that is, formed through the decomposition in place of the underlying rocks, principally granite.

The Cecil, Durham, Appling, Davidson, Iredell, Wilkes, Georgeville, and Alamance series comprise the upland soils, while the

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<sup>2</sup> See footnote on page 6.

alluvial soils are classed in the Congaree and Roanoke series. The most important soils are the Durham, Appling, and Cecil.

The Durham sandy loam is distributed throughout the east-central and southeastern parts of the county, where it occupies undulating to rolling areas. It is naturally well drained. More than two-thirds of this type is under cultivation. Tobacco and corn, the most important crops, give good yields. The Durham coarse sandy loam and fine sandy loam are soils of small extent.

The Appling coarse sandy loam, sandy loam, fine sandy loam, and gravelly sandy loam are good all-around soils. They are used principally for tobacco, corn, cotton, and wheat. The stony sandy loam of this series is generally rough and excessively drained, and little of it is cultivated.

The Cecil sandy loam, fine sandy loam, and clay loam occupy nearly level to hilly areas, and are well drained. Corn, wheat, cotton, and clover do well on these types. The Cecil stony sandy loam and coarse sandy loam are inextensive soils of little agricultural importance.

The Georgeville silt loam and Alamance silt loam are for the most part forested. They are in need of more organic matter and lime when placed in cultivation.

The Wilkes fine sandy loam is an unimportant soil, used mainly for pasture and forestry.

About one-half of the Iredell fine sandy loam is in cultivation. It has generally poor underdrainage and does not give high yields.

The Davidson clay loam is a rolling, well-drained soil confined to three small areas. It is a desirable farming type.

None of the typical Roanoke silt loam is under cultivation. It occupies small terrace areas along Nutbush Creek, with one unimportant development on Tabbs Creek.

The Congaree silt loam and Meadow (Congaree material) occupy poorly drained first bottoms along streams. The soil is naturally productive and should be reclaimed.

[PUBLIC RESOLUTION—No. 9.]

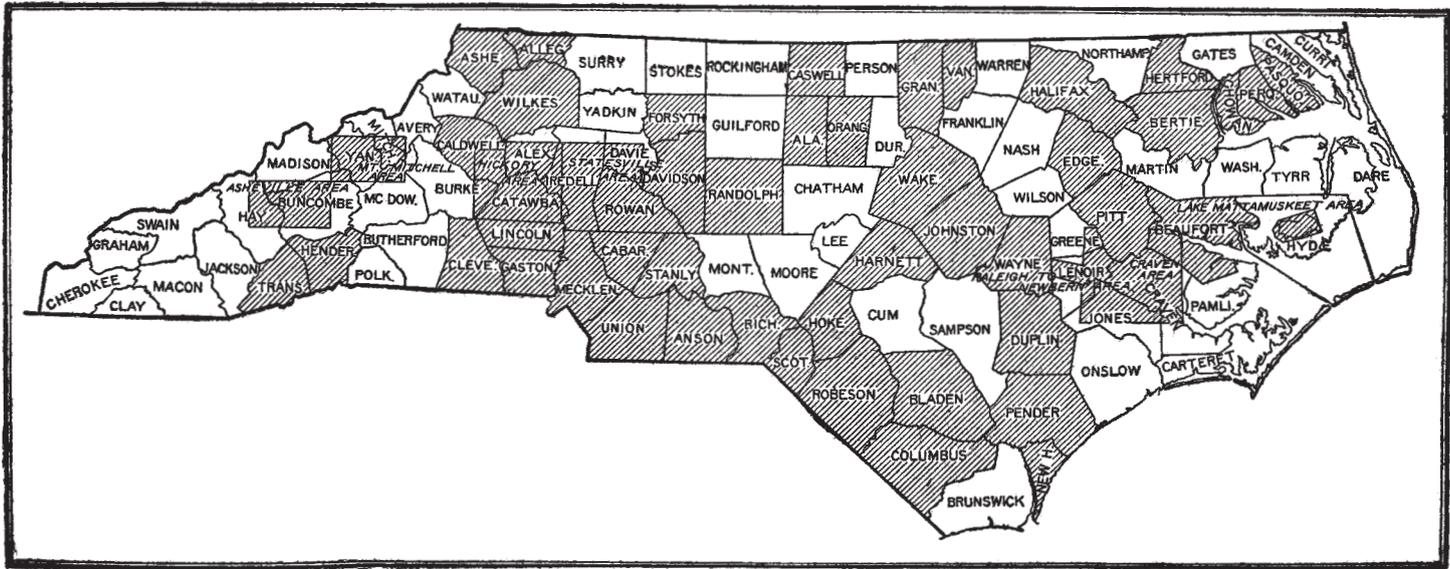
JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

*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.

# Accessibility Statement

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