Issued September 14, 1907.

U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

IN COOPERATION WITH THE STATE DEPARTMENT OF AGRICULTURE, S. L. PATTERSON, COMMISSIONER. B. W. KILGORE, STATE CHEMIST.

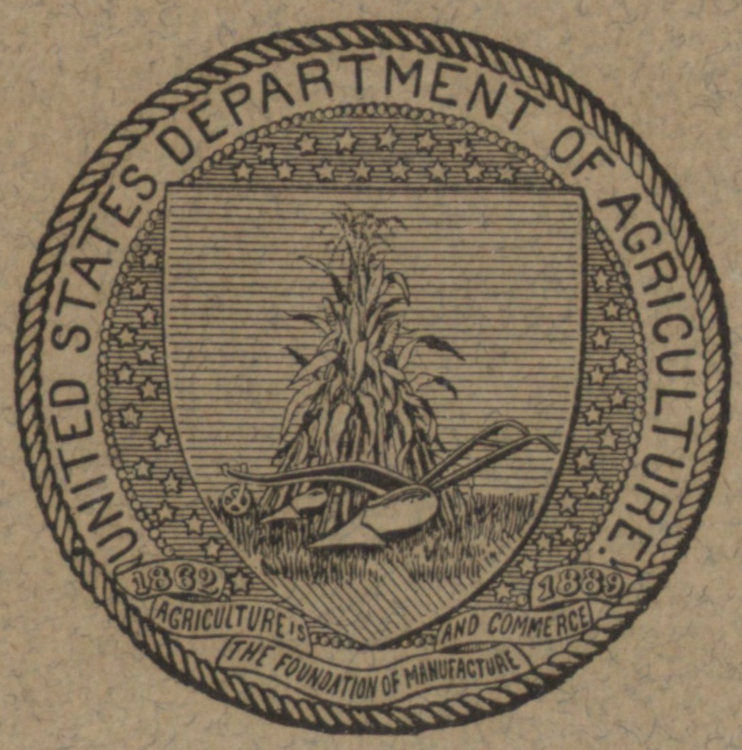
SOIL SURVEY OF CHOWAN COUNTY, NORTH CAROLINA.

BY

W. EDWARD HEARN.

Assisted by G. M. MacNider, of the North Carolina Department of Agriculture.

[Advance Sheets—Field Operations of the Bureau of Soils, 1906.]



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1907.

[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.]

Issued September 14, 1907.

U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

IN COOPERATION WITH THE STATE DEPARTMENT OF AGRICULTURE, S. L. PATTERSON, COMMISSIONER. B. W. KILGORE, STATE CHEMIST.

SOIL SURVEY OF CHOWAN COUNTY, NORTH CAROLINA.

BY

W. EDWARD HEARN.

Assisted by G. M. MACNIDER, of the North Carolina Department of Agriculture.

[Advance Sheets—Field Operations of the Bureau of Soils, 1906.]

WASHINGTON:

GOVERNMENT PRINTING OFFICE.

1907.

LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., March 20, 1907.

SIR: At the instance of the North Carolina department of agriculture, transmitted by Prof. B. W. Kilgore, State chemist and director of the agricultural experiment station, and at the earnest request of Hon. John H. Small, a soil survey was made of Chowan County, North Carolina, during the summer of 1906. This survey was performed in continuation of the cooperative work between the Bureau of Soils and the North Carolina department of agriculture, and was undertaken for the purpose of studying the distribution of the soils and their characteristic differences, with a view to determining their adaptations to various crops and with especial reference to the possibilities of the further extension of the trucking industry in this part of the State. I transmit herewith the report and map covering this work and recommend their publication as advance sheets of the Field Operations of the Bureau of Soils for 1906, as authorized by law.

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

Hon. JAMES WILSON,
Secretary of Agriculture.

CONTENTS.

	Page.
SOIL SURVEY OF CHOWAN COUNTY, NORTH CAROLINA. By W. EDWARD HEARN, ASSISTED BY G. M MACNIDER, OF THE STATE DEPARTMENT OF AGRICULTURE	5
Description of the area	5
Climate	7
Agriculture	8
Soils	10
Norfolk fine sand	11
Norfolk fine sandy loam	14
Norfolk silt loam	16
Norfolk coarse sand	17
Portsmouth fine sandy loam	18
Portsmouth silt loam	19
Portsmouth loam	21
Portsmouth fine sand	23
Swamp	24
Summary	25

ILLUSTRATIONS

TEXT FIGURE.

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

MAP.

Soil map, Chowan County sheet, North Carolina.

SOIL SURVEY OF CHOWAN COUNTY, NORTH CAROLINA.

By W. EDWARD HEARN, Assisted by G. M. MacNIDER, of the State Department of Agriculture.

DESCRIPTION OF THE AREA.

Chowan County lies in the northeastern part of North Carolina, and is about 80 miles south of Norfolk, Va. The county is bounded on the north by Gates County, on the east by Perquimans County, on the south by Albemarle Sound, and on the west by the Chowan River. The area so included is long and narrow, and there is a navigable water frontage along Albemarle Sound and the Chowan River of

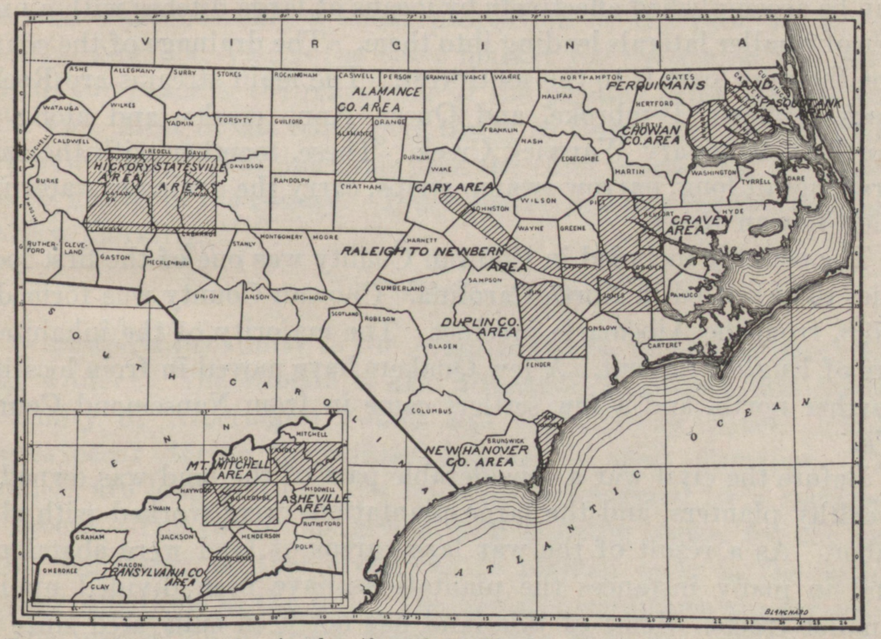


FIG. 1.—Sketch map showing location of the Chowan County area, North Carolina.

about 40 miles. The county contains 113,920 acres, or 178 square miles.

In general the surface of Chowan County consists of level, undulating, gently rolling, and rolling areas interspersed with many small swamps and slight depressions. The general slope of the county is to the southwest, except in the extreme eastern end, where it is to the southeast. Most of the undulating and practically all the gently

rolling and rolling areas occur in the northern and western parts. The elevation varies from 50 feet in the northern part down to almost sea level in the southern part. A sand ridge, which is probably an old beach line, running from the northeast corner of the county in a southwest direction toward Chambers Landing, marks the divide between the rolling country and the broad, uniformly flat, and undulating areas which constitute all the eastern end of the county and also a large area to the north and northwest of Edenton, including what is known as Bear Swamp. The elevation of this part of the county ranges from 5 to 20 feet above sea level. To the eye the surface appears perfectly flat, except where broken here and there by swampy depressions.

The greater part of the northern end and western side of the county, because of its gently rolling topography, has fairly good natural surface drainage, and only a few open ditches are necessary to complete the drainage of these sections. Practically all the level and flat areas in the eastern part have to be artificially drained, but this can be accomplished effectively by means of large ditches with a number of smaller laterals leading into them. The drainage of the county for the most part is to the southwest. The main streams are Rockyhock, Dillard, Pembroke, and Queen Anne creeks, and along the northern boundary Warwick Creek. These, together with the small branches of long, narrow swamp strips, carry the drainage water into the Chowan River.

The country included in Chowan County was one of the first localities to be settled in North Carolina. Chowan County was formed in 1738, from the Albemarle precinct. The majority of the inhabitants are of English descent. A few Quakers have moved in from localities farther north, and a few settlers came in from Nansemond County, Va.

Before the civil war a considerable part of the land was owned by wealthy planters, and the large plantations were worked with slave labor. As a result of the war large areas of land were abandoned, and in many instances the plantations have been divided up into smaller tracts. Some of this land has not been cultivated since the war and has become forested to a second growth of pine, with a dense undergrowth. Considerable virgin forest land is found, especially in the Bear Swamp section. Some of the most productive soils are undeveloped, and the county could support a very much larger population than it does now.

Many good frame houses, neatly painted, and other farm improvements are seen, especially in the vicinity of Mege. The farmers are generally prosperous. Considerable improved labor-saving machinery is used throughout the county.

Edenton, located in the southern part on Edenton Bay, is the county seat and chief town and has a population of about 3,200. Several shipping points are located along the railroads, the largest of these being Tyner. The county is fairly well supplied with transportation facilities. A line of the Norfolk and Southern Railroad, which runs from Norfolk, Va., to Bellhaven, N. C., passes through Edenton, crossing Albemarle Sound by a large ferry barge. A branch of the Norfolk and Southern runs northwest through the county from Edenton to Suffolk, Va. These lines furnish excellent facilities for handling passengers and freight. A steamer plies the Chowan River, stopping at several wharves within the county. Passenger boats and a large number of fishing schooners and towboats are seen on Albemarle Sound.

The dirt roads are fairly good, except those in the Norfolk fine sand areas, where the sand works up badly. The county is well served by the rural free delivery of mail. Fairly good schoolhouses are seen in the rural districts. There are no important markets in the county. Edenton consumes only a small proportion of the products of the county. Norfolk, Va., is the chief market for the cotton and for a part of the peanuts, the remainder of the peanuts being sold in Suffolk, Va. Most of the truck goes direct to Baltimore, Philadelphia, and New York. Baltimore has been the chief market for the watermelons grown in the county. Truck loaded one day reaches the market next morning.

CLIMATE.

Owing to its proximity to the Atlantic Ocean, Chowan County has mild winters. The climate is also influenced to some extent by the proximity of Albermarle Sound and the Chowan River. Slight freezes occur during the winter, but are of short duration. The summers are long and hot, but are usually tempered by a southeast sea breeze. The conditions give a long growing season for the tenderest vegetation, so that crops can be planted early in the spring and harvested late in the fall. The climatic conditions are favorable for the production of truck crops, forcing them to early maturity. Truck grown here would in all probability be ready for market several days ahead of the truck grown around Norfolk, Va.

The following tables show the normal monthly temperature and precipitation, and the occurrence of spring and fall frosts as recorded by the Weather Bureau station at Edenton.

Normal monthly and annual temperature and precipitation.

Month.	Edenton.		Month.	Edenton.	
	Temperature.	Precipitation.		Temperature.	Precipitation.
	°F.	In.		°F.	In.
January	41.9	3.48	August	79.6	5.21
February	41.8	4.72	September	72.3	2.50
March	51.3	3.96	October	61.9	4.56
April	58.1	3.15	November	52.0	3.07
May	68.5	5.30	December	42.2	3.04
June	74.9	3.60	Year	60.4	47.77
July	80.3	5.18			

Dates of first and last killing frosts.

Year.	Edenton.		Year.	Edenton.	
	Last in spring.	First in fall.		Last in spring.	First in fall.
1898	Apr. 6	Nov. 26	1903	Apr. 5	Oct. 29
1899	Apr. 6	Oct. 22	1904	Apr. 20	Nov. 7
1900	Apr. 5	Nov. 17	1905	Apr. 17	Nov. 14
1901	Mar. 17	Nov. 7	Average	Apr. 3	Nov. 7
1902	Mar. 7	Oct. 23			

AGRICULTURE.

The agriculture of Chowan County has almost completely changed within the last forty years. Corn and wheat, with a small quantity of oats, were the principal crops grown before the war. The cultivation of corn dates back to the time when the county was first settled. Large numbers of hogs were raised and some cattle. Only a small quantity of cotton was grown and in many places only enough to supply material for domestic manufacture. No peanuts were grown before the war. Practically all supplies for home consumption were produced on the farm. Immediately following the war cotton came in as one of the staples and is now the most important crop. The acreage devoted to wheat and oats has decreased, until these crops have been practically eliminated from the list of farm products. The growing of peanuts on a commercial scale began about twelve or fifteen years ago. In recent years considerable truck has been grown. At the present time cotton is the most important money crop grown in the county. Next in importance is corn, with a rather large acreage. Peanuts rank third in the value of farm products and are a ready-money crop, selling at from 2 to 4 cents a pound. Considerable quantities of sweet potatoes, Irish potatoes, and watermelons are grown. Quite a little trucking is done near the railway stations, and such products as Irish potatoes, English peas, snap beans, and cabbage are shipped to the northern markets. Only a small quantity of oats is

grown. A little tobacco is produced. Scuppernong and Mish grapes are grown to some extent in the northeastern part of the county, and are either shipped to the wineries in Suffolk or manufactured into wine at home. Many hogs are raised, most of them being of nondescript breeds. Some cattle are also raised, besides a few goats and sheep. As there is no law for keeping stock inclosed, they run at large and roam all over the county. A few peaches, pears, apples, and cherries are grown. The peaches give the best returns. Fishing in Albemarle Sound and the Chowan River is an important industry, and a considerable revenue is derived from it during the spring months. The lumber industry is also a source of income, although nearly all the merchantable timber has been cut.

Throughout the county it is a generally recognized fact that the Norfolk fine sand and the lighter and looser phases and better-drained areas of the Norfolk fine sandy loam and Portsmouth fine sandy loam are best suited to truck crops. It is also recognized that the Portsmouth loam is the best soil for corn. Cotton, corn, and peanuts, however, are grown to a greater or less extent on every soil type in the county, and without much consideration as to the adaptability of these crops to the different soil types.

No systematic rotation of crops is practiced by the majority of farmers. A few rotate cotton with peanuts, and others cotton, corn, and peanuts. Many farmers, however, plant cotton or corn year after year on the same land. The prevailing desire to grow large quantities of cotton prevents any regular rotation, and in many instances causes the soil to deteriorate and become unprofitable for cotton. Only in a few localities are the cultural methods the best that might be employed. Where modern methods are followed excellent results are obtained. The practice of using a one-horse plow and merely scratching the surface is inadequate for the proper preparation of most of the soils in the county. The topography of the county and the texture of the soils are such that improved plows, cultivators, etc., can be used advantageously. Many two-horse cultivators are used. Cotton and generally peanuts are planted by machine.

The labor of the county is mainly colored. In some sections it is rather scarce, and in Bear Swamp section it commands a little higher wages than in other parts of the county. There is not much difficulty in securing labor around Mege and Gliden. The rate per month is about $15, with rent and subsistence free, and the day rate is from 50 to 75 cents, with board.

Tenant farming is conducted on rather an extensive scale, especially around Edenton and in the east end of the county. Most of the land is cultivated on the share system. The landowner furnishes the land, stock, feed for stock, implements, keeps up repairs, and pays

25831—07 M——2

one-half of the fertilizer bills and receives one-half of all the crops produced.

The farms vary greatly in size, ranging between 50 and 2,000 acres. The average farm probably contains 150 or 200 acres. The farms in the northern and western parts of the county are operated to a considerable extent by the owners, and on these farms the best improvements are seen. Farm land is held in high esteem and not much of it is changing hands. Improved land around Edenton and several stations along the railroad ranges in price from $50 to $100 an acre, and in other parts of the county from $10 to $30 an acre.

All the soils, except the more sandy types, should be plowed deeper and pulverized more thoroughly, and this should be followed by shallow cultivation.

The land lies beautifully for the use of modern farm machinery, and more should be used. The selection of better seed corn and cotton would be wise. A systematic rotation of cotton, corn, and peanuts would improve the soil. Green manure crops, such as cowpeas or clover, if turned under and the soil dressed with lime, would give excellent results. More cowpeas should be grown. Large quantities of peaty and mucky material should be placed on the more sandy soils. More stock ought to be raised and more manure made and placed on the land. The aim should be to produce hay and grain enough for home use, so that returns from the cotton, peanuts, and truck crops would be more nearly clear profit. Large quantities of commercial fertilizers are used in the county, but when proper preparation and cultivation of the soil and a suitable rotation of crops are practiced it is thought the use of so much fertilizer will not be necessary. Practically all crops are fertilized more or less. Marl from a bed near Holly's Wharf has been used quite extensively and with good results, especially on sandy land.

The drainage over a part of the county might be greatly improved by tile drains. The farmers should organize for the purpose of constructing and maintaining large open ditches throughout the county.

SOILS.

The soils of Chowan County are sedimentary in origin and are derived from the Columbia formation. This formation consists of sands, sandy loams, and silt loams, interspersed with many small swamp areas of peaty and mucky material. This section of North Carolina has been covered several times by the Atlantic Ocean, and the materials constituting the Columbia formation were brought down from the Piedmont section of the State and deposited under water. Owing to the different velocities and the consequent different sorting power of the currents, material of the same degree of fineness or

specific gravity would be deposited in one place. In some cases wave action has played an important part in sorting out and redepositing the different grades of soil material. This action of the currents and waves accounts largely for the occurrence of soils of different texture, such as sands, sandy loams, and silt loams. Owing to the generally flat surface of the country, erosion has had little part in modifying the soil material since its deposition and subsequent elevation above sea level.

The soils of the county have been classed into eight types, exclusive of Swamp, and the area of each is shown by a separate color on the accompanying map. The types are included in two distinct and important soil series, namely, the Norfolk series and the Portsmouth series. The soils of these series are distinguished from each other by differences in topography, drainage, color, and organic-matter content. The Norfolk series occurs in areas where the drainage has been fairly well established. The soils are light in color and have a small organic-matter content. The soils of the Portsmouth series occur in the large interstream areas, where the drainage is imperfect and there has been an accumulation of large quantities of vegetable matter, giving to the soils a brown or black color. These two series embrace practically all of the important soils of the Atlantic seaboard in North Carolina, and include early truck soils, tobacco soils, fruit soils, and soils suited to general farming purposes.

In Chowan County the Norfolk series is represented by the Norfolk fine sand, Norfolk fine sandy loam, Norfolk silt loam, and Norfolk coarse sand. The Portsmouth series is represented by the Portsmouth fine sandy loam, Portsmouth silt loam, Portsmouth loam, and Portsmouth fine sand.

The following table gives the area of the several types:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Norfolk fine sand	28,032	24.6	Portsmouth fine sand	3,840	3.4
Portsmouth fine sandy loam	22,208	19.5	Norfolk silt loam	3,648	3.2
Norfolk fine sandy loam	17,024	14.9	Norfolk coarse sand	384	.3
Portsmouth silt loam	16,256	14.3	Total	113,920	.....
Swamp	15,104	13.3			
Portsmouth loam	7,424	6.5			

NORFOLK FINE SAND.

The soil of the Norfolk fine sand consists of a gray, whitish, or light-brown fine sand with an average depth of 8 inches. Spots of black or dark-gray fine sand are of frequent occurrence. The

whitish sand occurs in dunelike ridges or knolls, is very leachy, and its agricultural value is quite low. In some places the gray or brown areas are slightly loamy, and these are considered the most productive. The soil is loose and open, and is the most easily tilled of any in the county.

The subsoil to a depth of 36 inches or more is a yellow, light-gray, orange, or white fine sand, loose and incoherent in structure, except near the margins of the other soils, where it sometimes becomes sticky at a depth of 30 or 36 inches. The white subsoil usually underlies the whitish surface soil.

The greatest extent of this type is in the northeastern part of the county and along the Chowan River from Pembroke Creek to the northern boundary of the county. It is typically developed around Tyner, Valhalla, and along the Suffolk branch of the Norfolk and Southern Railroad. One small body lies along Albemarle Sound to the southeast of Edenton.

The surface features of the Norfolk fine sand consist of undulating, gently rolling, and rolling areas, usually in the form of gently rolling ridges, running north and south, parallel with the Chowan River. The most prominent of these ridges begins at the northeast corner of the county and runs in a general southwestern direction to near Emperor Landing. This ridge is probably an old terrace line. This type occupies the highest position in the county, reaching an altitude of 50 feet. Some dunelike ridges and knolls are seen and a few level areas occur in some localities.

The Norfolk fine sand, by reason of its topographic position and its open and loose structure, has excellent natural drainage for the most part. The rainfall readily passes through both the soil and subsoil. Only a few of the flattest areas need draining, and this can be accomplished by open ditches. A considerable proportion of the type suffers from drought, especially the dunelike ridges and knolls. Farming operations can be carried on immediately after a rain.

The Norfolk fine sand is sedimentary in origin and represents the coarser materials sorted out by wave or stream action. Some few areas have likely been modified by wind action. Only a small quantity of organic matter has accumulated in the soil. Quite large areas of this type are undeveloped and are commonly covered by a scrubby growth of pine intermingled with sweet gum and scrub oak. On a few spots some merchantable timber is seen.

The Norfolk fine sand is a warm and very early soil and is especially adapted to early truck crops, such as Irish potatoes, melons, English peas, turnips, cabbage, and snap beans. It is well suited to the growth of the Scuppernong and Mish grapes. These are grown mostly in the northeastern part of the county. Peaches and cherries

seem to do well on this soil, and the growing of these is recommended. Of the staple crops corn and peanuts seem to give the best returns. Using from 200 to 400 pounds of fertilizer corn produces from 15 to 25 bushels per acre and peanuts from 30 to 70 bushels.

Cotton gives low yields except when heavily fertilized. Irish potatoes, sweet potatoes, melons, and English peas give good returns. The yields on this type are directly in proportion to the amount of fertilizer applied.[a] Cultivation is carried on with ease, and hence more of this type is under cultivation than would otherwise be the case. Improved machinery should be used more generally than it is. This soil brings from $15 to $25 an acre, and some of it is valued even higher where a water frontage is secured by the purchase.

As large areas occur along the Chowan River, considerable raw fish scrap is annually applied to the corn and peanuts. Muck should be added to this soil in large quantities, and any other methods fol-

[a] Two large samples of this type of soil collected at points near Edenton and Centerhill, were made the subject of a study by the wire-basket method to determine its manurial requirements. One of these samples was from a field that had not been cultivated for some years, although the adjacent fields of the same type give good yields. The other sample was taken from cultivated land that has received applications of small amounts of low-grade commercial fertilizer quite frequently, usually from 150 to 200 pounds per acre carrying 2 per cent nitrogen, 8 per cent phosphoric acid, and 2 per cent potash. With this fertilization and the usual cultural methods of this section the yields range from 15 to 30 bushels of corn and from 30 to 70 bushels of peanuts.

In the wire-basket tests, applications were made of nitrate of soda, acid phosphate, and sulphate of potash, singly and in various combinations, stable manure, lime, and cowpea vines to which lime was added.

The application of cowpea vines gave, in both instances, the largest increase in plant growth, followed by stable manure, the amount of increase in both cases being amply sufficient to repay the labor and cost of such preparation of the land. Upon the sample from the cultivated field from near Edenton, the use of commercial fertilizers, either singly or in combination, as well as lime, and fertilizer and lime was attended by satisfactory increases in plant growth, particularly that obtained from the complete fertilizers with and without the addition of lime, while in no instance upon the sample from the uncultivated field near Center Hill did the same fertilizers produce sufficient increase over the untreated soil to warrant their use.

These results, and the further observation that the plants produced by the untreated soil from the cultivated field were but half the weight of those from the uncultivated, where, by the decay of the natural growth of annual weeds, etc., there has been an accumulation of organic matter, presents very strikingly the necessity for keeping up the organic content of soils of this type either by the introduction of a legume for green manuring into the rotation or the liberal use of stable manure.

In this test wheat was used as an indicator, and while these results are held to apply strictly to the fields from which the samples were obtained and to wheat or a similar crop, yet the results thus obtained will no doubt apply to all of this type in this locality.

lowed that will render the soil more loamy and make it more retentive of moisture.

The following table gives the results of mechanical analyses of a typical sample of this soil:

Mechanical analyses of Norfolk fine sand.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per ct.	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*
14917	Soil	0.4	2.6	7.5	70.4	5.7	6.7	7.0
14918	Subsoil	.0	2.3	9.0	70.0	5.5	6.3	6.7

NORFOLK FINE SANDY LOAM.

The soil of the Norfolk fine sandy loam consists of a yellowish-gray, gray, or light-brown fine sandy loam, varying in depth from 6 to 30 inches, with an average depth of 12 or 15 inches. Spots of silty and very fine sandy loam occur here and there, especially in the vicinity of Mege, where this type grades into the Norfolk silt loam. In a few localities where the type joins the Norfolk fine sand the soil is deeper and looser and its agricultural value is slightly below the average for the type.

The subsoil to a depth of 36 inches or more is a yellow sandy clay. There are some places where the subsoil becomes rather tough and stiff at 30 inches. Again there are local spots where a yellow sticky sandy loam, or a yellow loam, is encountered.

The largest development of the Norfolk fine sandy loam is around Mege and to the west and southwest of that town. It is also well developed around Edenton, the largest area lying toward the east. Other smaller areas occur in different parts of the county, mostly bordering stream courses.

This type occupies level, undulating, and gently rolling areas and rolling and hummocky areas near the small streams and swamps. The drainage for most of the type is good on account of the open structure of the soil and the gently rolling position which a part of it occupies. The more level areas are drained by open ditches, which are essential to successful cultivation, and can be constructed quite easily. The banks stand up well, thus insuring considerable permanency. A few low, wet areas of this type are found here and there.

The Norfolk fine sandy loam is derived from the Columbia formation, but has been modified considerably by erosion. Occurring as it does in gently-rolling areas, an appreciable quantity of the silt and clay has been carried away in suspension, and consequently a deeper, looser, and sandier soil is found on the more rolling areas, while a mellow sandy loam occurs in the more level areas.

The greater part of the Norfolk fine sandy loam is under cultivation. It is considered one of the best general farming soils in the county. It is well suited to cotton and peanuts, the heavier areas to corn, and the lighter phase to sweet potatoes, beans, Irish potatoes, English peas, cabbage, spinach, and peaches. Alfalfa and clover would probably do well. Scuppernong grapes would give good returns. The soil is also adapted to bright tobacco, but only one or two patches were seen. The crop is not certain and should be grown as a special side crop.

All crops common to the county are grown upon this soil. Corn produces from 15 to 30 bushels, cotton from one-third to 1 bale per acre—the 1-bale yield being produced by proper cultivation and the use of about 400 pounds of fertilizer—and peanuts from 50 to 100 bushels. Peanuts are usually fertilized, but not very heavily. Potatoes and all kinds of truck crops do well. Peaches seem to do well on this soil and it would seem that more orchards should be set out.

The Norfolk fine sandy loam is a mellow and easily tilled soil, and one upon which all kinds of labor-saving farm machinery could be easily operated. Some of this type is farmed the best of any soil in the county, improved plows and cultivators being used. A marked improvement is noted in the appearance of the crops where such machinery is used. Practically all of this type is fertilized to a greater or less extent. Some of the farmers use a complete fertilizer, while others mix cotton-seed meal, acid phosphate, and kainit.[a] Some of the soil receives a little fish scrap for corn and peanuts. The type near Edenton is held at about $100 an acre, and around Mege at $50 an acre.

[a] Two samples of this soil type, collected from fields near Edenton and Centerhill, were tested by the wire-basket method to determine the manurial treatment best adapted to local conditions.

The fields from which samples were drawn have been devoted to the production of cotton, corn, and peanuts, the latter occasionally, but no systematic rotation has been followed, nor, with the exception of the peanuts, have legumes been grown. Light applications of commercial fertilizers are made upon the cotton.

Portions of these samples were treated with stable manure, cowpea vines and lime, nitrate of soda, acid phosphate, sulphate of potash, and lime, applied singly and in various combinations. Good increases in plant growth followed the use of a complete fertilizer to which lime was added, as well as from the use of stable manure. Applications of cowpea vines and lime, however, produced a very superior growth of the wheat plants used as indicators. Mineral fertilizer salts used singly did not give results sufficient to warrant their use in this way.

While these results are held to be strictly applicable to the fields from which the samples were obtained, they are without doubt a reliable indication of the manurial requirements of this type in this area.

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

Mechanical analyses of Norfolk fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per ct.	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*
14921	Soil	0.0	0.8	0.0	51.8	18.2	19.0	10.3
14922	Subsoil	.0	.2	.5	31.1	26.5	14.7	26.9

NORFOLK SILT LOAM.

The soil of the Norfolk silt loam consists of a yellowish or grayish silt loam varying in depth from 6 to 12 inches and containing in some places a relatively high percentage of very fine sand. In a few localities the soil is of a light brown color. In spots, and especially along Albemarle Sound, it is a heavy very fine sandy loam to a depth of 2 or 3 inches, grading into a mellow silty loam. The subsoil is a yellow heavy silty loam, sometimes grading into a silty clay which is frequently darker in color than the soil.

The Norfolk silt loam occurs in small bodies to the southeast of Edenton, along Albemarle Sound. It is also found around Mege, to the west of Gliden, and to the southeast of Chowan. The surface is gently rolling to level, thus insuring fairly good drainage for most of the type. The more level areas can be drained easily by open ditches, which are necessary in many instances.

The Norfolk silt loam owes its origin to the weathering of the finer sediments of the Columbia formation. Part of the type has been modified by erosion, leaving the surface somewhat sandy in places, while in others the heavy yellow silt loam subsoil is exposed. The latter contains only a small percentage of organic matter.

The greater part of this type is under cultivation, the remainder being forested to second-growth pine. It seems to be better suited to the production of cotton and corn than any other crops grown upon it. The yield of cotton ranges from one-third to 1 bale, of corn from 20 to 30 bushels, and of peanuts is about 50 or 60 bushels per acre. Only a very small acreage is devoted to any other crop, except vegetables for home use. On a few farms improved plows and cultivators are in use. The soil should be plowed deeper and pulverized more thoroughly, thus preventing clodding and insuring larger yields. The soil is deficient in organic matter, and green manures and lime, or any kind of coarse manure, would be very beneficial. Commercial fertilizers are used to a greater or less extent on all parts of this type. Some raw fish scrap is applied to corn on the areas along Albemarle Sound.

The following table gives the results of mechanical analyses of representative samples of the soil and subsoil of the Norfolk silt loam:

Mechanical analyses of Norfolk silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per ct.	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*
14925	Soil	0.1	0.2	0.4	21.5	17.6	39.8	20.6
14926	Subsoil	.0	.1	.2	14.1	12.4	25.9	46.6

NORFOLK COARSE SAND.

The soil of the Norfolk coarse sand is a light-gray or light-brown coarse to medium sand, with a depth of 6 to 8 inches. The subsoil to a depth of 36 inches is a yellow or gray coarse sand, sometimes becoming sticky at 30 inches. Both the soil and subsoil have a loose open structure and in places are quite incoherent. The soil is very easily tilled, and shallow, but frequent cultivation is necessary.

This type is of very limited extent in Chowan County, only one body being encountered. This lies in the southwestern part of the county, about 4½ miles northwest of Edenton, and covers about 400 acres. It occupies a gently rolling to undulating area, having an elevation of from 20 to 30 feet above sea level. The drainage is good and the soil can be tilled immediately after a rain. It is very leachy and suffers from drought.

This type represents the coarser material of the Columbia formation. It has not weathered to any appreciable extent since its deposition, nor has any large quantity of vegetable matter accumulated in it.

The Norfolk coarse sand is a fair trucking soil and should be devoted to truck crops and light farming. Potatoes and melons do well. Scuppernong grapes would give good returns. Peanuts, cotton, and corn are the main crops grown upon it. Low yields are obtained except when it is heavily fertilized. The soil can be improved by turning under green manuring crops, applying large quantities of peaty material, and adding lime. These would render the soil more loamy and retentive of moisture, as well as otherwise improve the conditions for plant growth.

Below are given the results of mechanical analysis of a typical sample of the Norfolk coarse sand.

Mechanical analyses of Norfolk coarse sand.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per ct.	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*
14915	Soil	5.9	39.5	12.3	27.3	3.1	4.1	8.2
14916	Subsoil	5.4	51.0	10.7	21.4	2.2	2.0	7.2

PORTSMOUTH FINE SANDY LOAM.

The soil of the Portsmouth fine sandy loam consists of a light-gray to dark-gray fine sandy loam ranging in depth from 8 to 24 inches, with an average depth of about 15 inches. To the north of Edenton, in the edge of the Bear Swamp section, the soil is a loose fine sandy loam, with a depth of 24 to 30 inches. Occasionally in typical areas the soil is a dark-gray fine sandy loam to 8 inches, underlain by a stratum of yellow fine sandy loam before the subsoil is reached. Another phase of this type occurs to the east of Mavaton, bordering the Norfolk fine sand. Here the soil is a black fine sandy loam or loamy sand, rather deep and of a loose texture, underlain by a sticky sandy loam. All areas of the type are easily tilled.

The subsoil is a dark-gray sandy clay, usually mottled with brown or yellow and generally somewhat plastic. In some spots the subsoil is a heavy fine sandy loam, while in others quite a heavy subsoil is found. Frequently at a depth of 32 or 36 inches a gray sticky fine sand is encountered.

The Portsmouth fine sandy loam covers the largest area and is one of the most important types in Chowan County. Its greatest development is found to the north and northwest of Edenton, around Hancock and to the east of Mavaton. It also occurs in large unbroken areas to the northeast of Edenton. Smaller bodies were mapped in the northern part of the county, around Gliden, and to the west and southwest of Ryland. There is also a body of this type found to the southeast of Edenton.

The surface features consist of broad level areas becoming slightly undulating near the small streams and swamps. The type lies favorably for general farming. The natural surface drainage is not good, except on the more undulating areas, but most of the type is well drained by open ditches. A few low-lying areas are rather wet and inclined to be swampy, but even these can be drained readily.

The Portsmouth fine sandy loam is a sedimentary soil derived from the Columbia formation. In many places considerable organic matter has accumulated, giving it a dark-gray or black color and producing a mellow loamy soil that is quite retentive of moisture. A few spots of medium sandy loam were found, but were not of sufficient size to be represented on the soil map.

This soil type is one of the best general-purpose soils in the county, and a fairly large percentage of it is under cultivation. The remaining portion is commonly forested to a second growth of pine with a few sweet gums and oaks scattered here and there. The soil is well suited to cotton, peanuts, and corn, and the lighter phases to truck crops, especially cabbage and English peas. Clover and alfalfa, while not grown at present, would most likely do well if the land were properly fertilized and prepared before sowing the seed.

The yield of cotton varies from one-third to 1 bale per acre, depending chiefly upon the methods of cultivation and to some extent upon the amount of fertilizer used. A yield of from 1 to 1½ bales per acre can be obtained with proper cultivation and the use of 600 or 700 pounds of fertilizer. Corn averages from 25 to 30 bushels, and peanuts from 50 to 100 bushels per acre. Sweet potatoes, Irish potatoes, cabbage, beans, and English peas give good returns on the lighter and better-drained areas. Part of the type is well cultivated and here the largest yields are secured. Some improved machinery is used on this type and its use could be greatly extended. The soil can be improved by turning under green manuring crops and adding lime.[a] Marl gives good results when applied to land to be used for peanuts.

The Portsmouth fine sandy loam is held in high esteem and brings from $50 to $100 an acre near the towns.

The results of mechanical analysis of a representative sample of this type are shown below:

Mechanical analyses of Portsmouth fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per ct.	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*
14929	Soil	0.3	1.6	5.0	43.4	23.8	16.8	9.2
14930	Subsoil	.3	1.3	4.4	40.2	23.4	12.0	18.5

PORTSMOUTH SILT LOAM.

The soil of the Portsmouth silt loam consists of a light to dark-gray silty loam with a depth of 8 to 15 inches, containing a relatively

[a] Samples were secured from points 5 miles and 1 mile north of Edenton and submitted to laboratory tests by the wire-basket method to determine the manurial requirements of this type.

The fields from which the samples were secured were typical of the soil in general. As far as could be learned the only fertilizers used were small applications of a brand carrying about 8 per cent phosphoric acid and 2 per cent each of nitrogen and potash. Neither green manure nor stable manure has ever been used. Cotton and corn have been the crops, though some peanuts have been grown.

The results of this test based upon the increase of plant growth upon samples given certain treatments over that observed upon the untreated soil, show the great improvement in productiveness that may reasonably be expected to follow the introduction of a systematic rotation including a legume for green manuring. Large increases were obtained from the use of cowpea vines and lime, complete fertilizer and lime, and stable manure. Lime alone proved somewhat beneficial. In no case was the increase in plant growth from the applications of the various mineral fertilizers sufficient to justify their use.

While these results are held to apply strictly to the fields from which the samples were taken, and to wheat, the indicator used in these tests, they will doubtless hold good for any similar crop upon this soil type throughout the area.

high percentage of very fine sand. It is mellow and works up in good tilth when plowed and harrowed under favorable conditions of moisture.

The subsoil is a gray heavy silty loam, usually compact and tough, and mottled or streaked with brown or yellow. Occasionally at a depth of 30 inches a heavy fine sandy loam is encountered in some places, while in others a silty clay may be found. Frequently the subsoil on exposure to atmospheric agencies turns a dull brown color. Strata of heavy fine sandy loam were found here and there.

The Portsmouth silt loam is confined exclusively to the southern and southeastern parts of the county. The principal area occurs to the east of Edenton and around Somerset, and embraces practically all the country between the Yeopim River and Albemarle Sound. One other area lies to the north of Edenton.

The surface of this type is almost always level, and has an elevation of from 5 to 20 feet above sea level. Near some of the small Swamp areas the surface becomes slightly undulating. The natural drainage is poor, and all the fields are drained by large ditches with smaller laterals leading into them. A large part of this type was so drained before the war, but these lands have since been abandoned and the drains have become filled with soil and débris.

The Portsmouth silt loam is derived from the finer material of deposits of recent geologic time. The texture is fairly uniform throughout and the percentage of organic matter is higher than in most soils of the county. Erosion has played little or no part in modifying the type since its deposition. There are large bodies of this type that are forested to a second growth of pine, with a thick undergrowth of vines, reeds, sweet gum bushes, etc. Most of it was cultivated prior to the war. The soil is adapted to corn and the better drained areas to corn and peanuts. Cabbages and late truck could also be grown. The yield of cotton ranges from one-third to 1 bale per acre, depending upon the method of cultivation and the amount of fertilizer used. Peanuts produce from 40 to 70 bushels and corn from 20 to 30 bushels per acre. A few Irish and sweet potatoes and some garden truck are grown for home use.

The Portsmouth silt loam is a rather strong soil and one susceptible of improvement. Its best development lies in better and deeper preparation, aeration, cultivation, the plowing under of cowpeas and lime, and a systematic rotation of crops.[a] Some improved machinery

[a] The manurial requirements of this soil were tested by the wire-basket method, using representative samples collected near Edenton. Insufficient drainage is in general the chief drawback to the successful cultivation of the type.

The results, as indicated by an increase in plant growth over that upon the untreated soil, show the necessity for the increase of the organic matter in the soils, the largest growth being obtained from the use of cowpea vines and the next largest from stable manure. The good effect of lime upon the physical condition of soils of this character was well brought out when lime was used either alone or with a complete fertilizer. Nitrate of soda, acid phosphate, and sulphate of potash used singly had but little effect, though in combination the nitrate of soda and sulphate of potash produced a very good increase.

It would seem from these tests that, with adequate drainage and the use of green manuring crops or stable manure, the fields from which these samples were taken would be made much more productive, as a direct result of their improved physical condition.

These results, while held to apply strictly only to the fields from which the samples were taken, are no doubt true for other areas of this type where similar conditions exist.

is now in use on one or two farms. All of the type should be cultivated by machinery. Some raw fish scrap is applied to this soil in some places along Albemarle Sound, usually in growing corn or peanuts.

Near Edenton this land sells for $50 an acre, while in the vicinity of Somerset the unimproved land brings from $10 to $20 an acre.

Below are given the average results of mechanical analyses of typical samples of this soil:

Mechanical analyses of Portsmouth silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per ct.	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*
14933, 14935	Soil	0.1	0.8	1.6	9.9	23.1	47.9	16.8
14934, 14936	Subsoil	.1	.2	.8	6.5	21.1	35.4	35.4

PORTSMOUTH LOAM.

The soil of the Portsmouth loam consists of a black or dark-gray loam, silty loam, or heavy fine sandy loam, with a depth of from 8 to 15 inches. It contains considerable organic matter, and is mellow and easily tilled. The subsoil is a heavy silt loam or silty clay of gray color, usually mottled with brown or yellow and frequently containing strata of sandy loam. Spots are found where the subsoil is a heavy, sticky loam or clay loam. In a few places a gray, sticky, sandy loam is encountered at 30 inches. Both the soil and subsoil are somewhat variable in texture, and grade imperceptibly into the adjoining soil types.

The only area of importance of the Portsmouth loam lies along the eastern boundary of the county, beginning about 4 miles north of Edenton and extending several miles north. It is the continuation of an area of this type in Perquimans County, and covers a large part of the section known as Bear Swamp.

The surface of this type is flat or slightly depressed, the elevation being appreciably lower than that of the surrounding soil types. The

natural drainage is poor, and part of the type is in a semiswampy condition. The drainage of the cultivated areas is effected by large, deep, open ditches. The rainfall passes slowly through the soil and it is somewhat difficult to secure good aeration. Most of this type could be permanently drained by an extensive system of ditching and the construction of one or two large canals.

The Portsmouth loam is derived from the finer sediments of deposits of recent geologic times. Its position has favored the accumulation of organic matter, and large quantities of vegetable mold are found in some localities. The greater part of this type is forested to a second growth of pine, with many sweet gum and black gum scattered here and there and with some cypress in the wetter areas. There is an undergrowth of reeds, vines, and briers, so dense as to render passage through it almost impossible.

This soil is especially suited to the growing of corn, and possibly cotton would do as well, if a suitable variety were planted and properly cultivated. It would produce large yields of hay. Some areas of it where there is considerable vegetable matter would probably grow onions and celery. Corn averages from 25 to 40 bushels per acre, and cotton from one-half to 1 bale, depending on the season. Some complaint is heard of the cotton not ripening.

This soil should be plowed deeper and more thoroughly pulverized, so as to give better aeration. It should be given liberal applications of lime.[a] It is a strong soil, and, though undeveloped at present, in the course of time it will be one of the most valuable soils in the county for the production of corn and grass. Well-improved land of this type sells for a good price, while the unimproved areas are comparatively cheap, but the expense of clearing and ditching adds considerably to the investment necessary to bring this land into cultivation.

[a] To determine the manurial requirements of this soil a large sample was obtained from a point 4½ miles north of Edenton and submitted to test by the wire-basket method. The field from which the sample was taken is flat and poorly drained. Applications of 600 pounds of fertilizer have been made when planted to cotton and 400 pounds when in corn, the yield being, in favorable years, as much as 1 bale of cotton and 40 or more bushels of corn per acre.

The results of these investigations indicate that applications of nitrate of soda, acid phosphate, and sulphate of potash, singly and in various combinations were slightly beneficial. Lime used alone and combined with a complete fertilizer gave a good increase in plant growth over that of the untreated soil. Stable manure also gave a good increase. The application of cowpea vines and lime, however, proved to be the most beneficial of all treatments applied to the soil. These results are, of course, strictly applicable only to the fields from which the sample was taken, but probably indicate in some degree the treatment suited to other areas of this soil under similar conditions.

The following table shows the average results of mechanical analyses of samples of this type:

Mechanical analyses of Portsmouth loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per ct.	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*
14937, 15139	Soil	0.7	1.8	4.3	25.5	24.6	20.4	21 5
14938	Subsoil	.4	2.3	7.5	31.7	17.1	12.6	27.9

PORTSMOUTH FINE SAND.

The surface soil of the Portsmouth fine sand consists of a black or very dark-gray fine sand varying in depth from 6 to 20 inches. In a few places a black loamy sand is encountered, while in a few other spots the soil is quite mucky. All areas of the type contain a large percentage of organic matter.

The subsoil to a depth of 36 inches or more is a yellow, gray, orange, or whitish fine sand, and in a few localities a loamy fine sand is found. Scattered here and there are small areas where the subsoil is a dark-brown or black fine compact sand, where the iron has segregated and cemented the sand particles together, producing a crust which is locally called a "hardpan."

The Portsmouth fine sand occupies a very small percentage of the area surveyed. It occurs only in the northern part of the county. Two large areas lie west of Burnett Millpond. Another area is found a little west of Beverly, and several areas occur north of Tyner. This type occupies level and slightly depressed areas, usually occurring in the Norfolk fine sand. Part of it is fairly well drained by open ditches, but the largest areas are at present poorly drained. Most of the type can be drained, reclaimed, and made fit for cultivation by means of open ditches.

The Portsmouth fine sand is of sedimentary origin and represents some of the coarser sediments of the Columbia formation. The position which it occupies has been favorable for the accumulation of organic matter, and practically all of it contains a large percentage of decayed vegetable remains.

This type is largely undeveloped, and only a few small fields are seen under cultivation. Most of it is forested to a second growth of pine, with a few sweet gums and oaks here and there. Gallberry bushes, reeds, and vines form a thick undergrowth. The soil is fairly well suited to the production of corn for a few years after it is cleared. Cabbage, late potatoes, and, on areas containing the largest quantity of organic matter, celery and onions would likely prove profitable crops. Corn is the chief crop grown and yields from 20 to

40 bushels per acre. A little cotton and a few potatoes are also grown.

The methods of cultivation on this type are those common to the surrounding soils. The soil is naturally more productive than the Norfolk fine sand surrounding it, on account of the large amount of organic matter and the more favorable moisture conditions.

The results of mechanical analyses of the soil and subsoil of this type are given in the following table:

Mechanical analyses of Portsmouth fine sand.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per ct.	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*
14927	Soil	1.3	3.9	14.5	69.9	1.6	4.7	4.9
14928	Subsoil	.0	1.8	18.2	71.2	1.4	4.0	4.0

SWAMP.

The areas mapped as Swamp consist of a heterogeneous mass of materials, usually covered by or saturated with water. Many of the largest areas consist of a black or brown peaty or mucky material containing limbs and bodies of trees and small quantities of mineral matter, and having a depth of several feet. Some of it is a fine mucky soil composed of silt and clay, with a small percentage of sand. Several of the small Swamp areas occurring in the sand or sandy loam areas consist of a black loamy sand or sandy loam and are sometimes underlain by a rather heavy impervious subsoil.

The largest areas of Swamp occur along the Chowan River, while many smaller areas are found along Rockyhock, Dillard, and Pembroke creeks. A few areas occur in the eastern end of the county, and narrow strips are found throughout the entire county, especially in the northern part. The type occupies the lowest positions in the county, large areas of it being at or near tide level, where drainage is quite impossible. The ends of a few small strips which extend back into the interior of the county could be drained and brought under cultivation. In many places the larger areas of the Swamp are underlain at from 6 to 20 feet by a stratum of marl of varying depths. In a few places this marl has been dug out and used as a dressing for other soils. All the Swamp areas are thickly forested to black gum, cypress, cedar, and sweet gum, and on the higher and drier areas a few pines are found. There is in many places a thick undergrowth of reeds, bay bushes, vines, briers, and near tide level a luxuriant growth of water-loving grasses. Part of this forest would produce considerable merchantable timber. The mucky and peaty material found in large quantities in these Swamp

areas is valuable as a fertilizer for nearly all the soils in the county, especially the Norfolk fine sand and the lighter phases of the Norfolk fine sandy loam and the Portsmouth fine sandy loam. It is, however, acid in character, and after applying it to the soil it is said that some form of lime should be used to put the soil in a fit condition for plants. If the experience of the farmers be taken as a guide, more of the peaty material should be used, and a more general use should also be made of the marl which underlies it.

SUMMARY.

Chowan County lies in the northeastern part of North Carolina and contains 178 square miles, or 113,920 acres. In general the surface consists of level, undulating, gently rolling, and rolling areas interspersed with many small swamps and slight depressions. Most of the rolling areas occur in the northern and western parts of the county, while the broad, uniformly flat, and undulating areas constitute all the eastern end of the county. Considerable virgin forest land is found in the county. Some of the most productive soils are undeveloped, and the county could support a much larger population than it does now. It has good transportation facilities, both by railroads on land and by boats on Albemarle Sound. Norfolk, Va., Baltimore, Philadelphia, and New York are the principal markets for the county.

Chowan County has a mild climate. Slight freezes occur during the winter, but are of short duration. The summers are long and hot, but are usually tempered by a southeast sea breeze. The growing season covers a period of about seven months.

Cotton, corn, peanuts, and truck are the principal crops grown, ranking in importance in the order named. Some cattle and many hogs are raised. Fishing in Albemarle Sound is an important industry, and some money is also derived from the lumber industry.

Rotation of crops is not practiced by the majority of the farmers. The cultural methods in use are not in many cases well adapted to the conditions. Considerable modern farm machinery is used, though the topography of the county and the texture of the soils are such that more could be used to advantage.

The labor of the county is mostly colored, and in some sections is rather scarce. Tenant farming is conducted on rather an extensive scale, most of the land being let out on the share system. The farms vary greatly in size, ranging from 50 to 2,000 acres. The average farm probably contains 150 or 200 acres. Farm land is held in high esteem, and not much of it is changing hands.

The soils of Chowan County are sedimentary in origin, and are derived from the Columbia formation. The materials constituting

this formation were brought down from the Piedmont section of the State and deposited in the ocean. Most of the soils are light textured, and consist of sands, sandy loams, and silt loams. The types are included in two distinct soil series—the Norfolk and the Portsmouth. The soils of these series are distinguished from each other by differences in topography, drainage, color, and organic-matter content. The Norfolk series occurs in areas where the drainage has been fairly well established. The soils are light in color and have a small organic matter content. The soils of the Portsmouth series occur in the large interstream areas, where the drainage is imperfect and there has been an accumulation of large quantities of vegetable matter, giving to the soils a brown or black color.

The Norfolk fine sand is admirably adapted to early truck crops, and is a good soil for small fruits and grapes.

The Norfolk fine sandy loam is one of the best all-round farming soils in the county. It is well suited to cotton and peanuts, the heavier phase to corn, and the light phase to early truck, especially cabbage, English peas, Irish potatoes, and strawberries. Peaches will do well on this soil.

The Norfolk silt loam is better suited to corn and cotton than any other crops grown here. On some of it peanuts will yield fairly well.

The Norfolk coarse sand is of very limited extent. It is a very early soil and is adapted to truck crops and light farming. It is subject to serious drought and produces low yields of the grain crops.

The Portsmouth fine sandy loam, the largest and one of the most important types in the county, is well suited to cotton, peanuts, and corn, and the lighter phase to truck crops, especially cabbage, English peas, and strawberries. Clover and alfalfa would do well if properly handled.

The Portsmouth silt loam is adapted to corn and grass, and the better drained areas to cotton and peanuts.

The Portsmouth loam is the best corn soil in the county. It will also produce good crops of grass. Some areas would probably be suited to onions and celery.

Only small areas of the Portsmouth fine sand are under cultivation. It is well suited to corn for a few years after being cleared. Cabbage, late potatoes, and, on areas which are quite mucky, celery and onions would prove profitable crops.

Swamp is a nonagricultural type. Its chief value at present lies in the use of its mucky and peaty material to improve the sandy soils.

O