

U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF SOILS

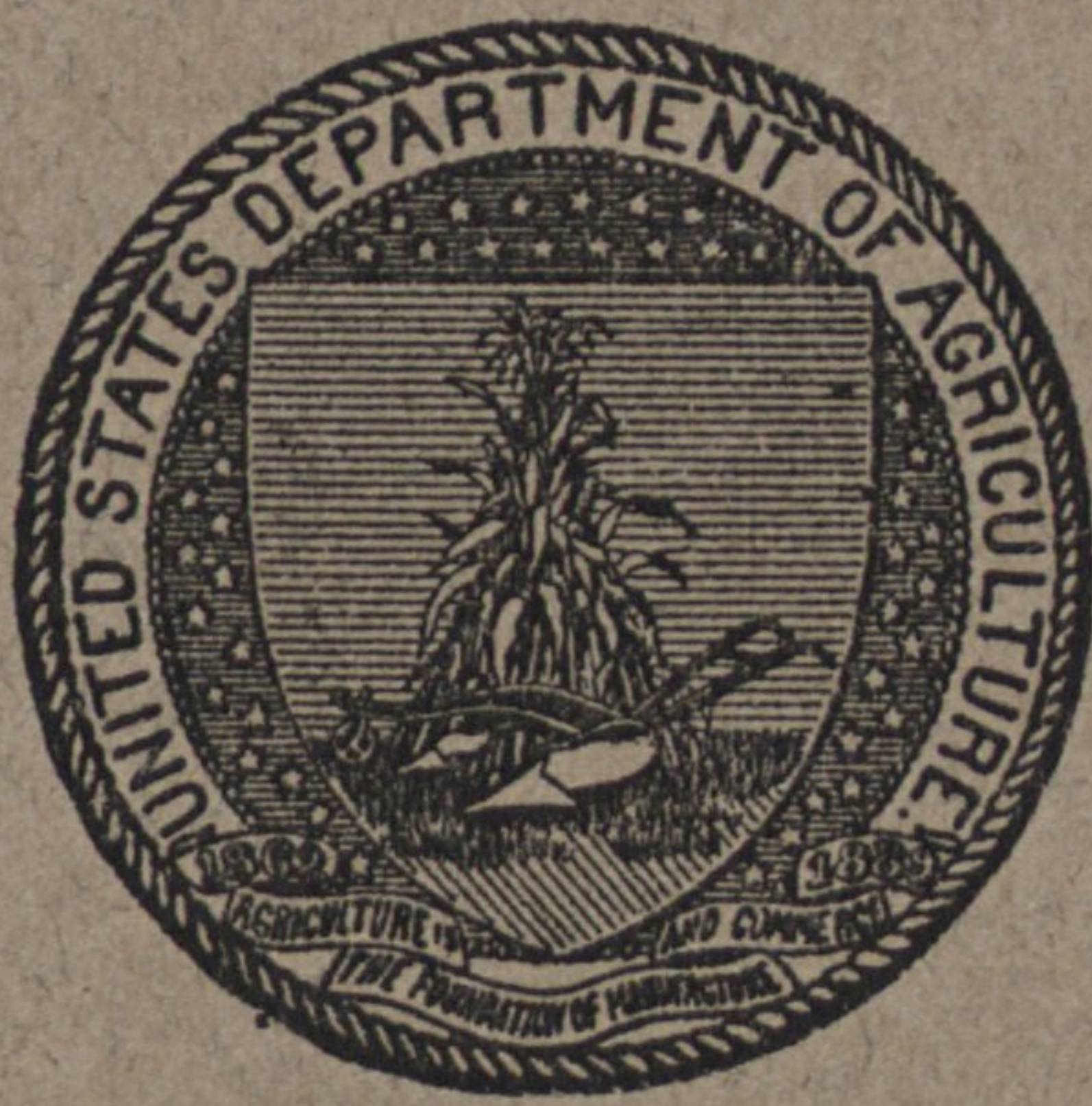
IN COOPERATION WITH THE NORTH CAROLINA DEPARTMENT OF AGRICULTURE
AND THE AGRICULTURAL EXPERIMENT STATION

SOIL SURVEY OF CAMDEN AND CURRITUCK
COUNTIES, NORTH CAROLINA

BY

S. O. PERKINS, IN CHARGE, W. D. LEE, AND G. B. SHIVERY,
OF THE U. S. DEPARTMENT OF AGRICULTURE, AND
S. F. DAVIDSON, OF THE NORTH CAROLINA
DEPARTMENT OF AGRICULTURE

[Advance Sheets—Field Operations of the Bureau of Soils, 1923]



WASHINGTON
GOVERNMENT PRINTING OFFICE
1926

U. S. DEPARTMENT OF AGRICULTURE

BUREAU OF SOILS

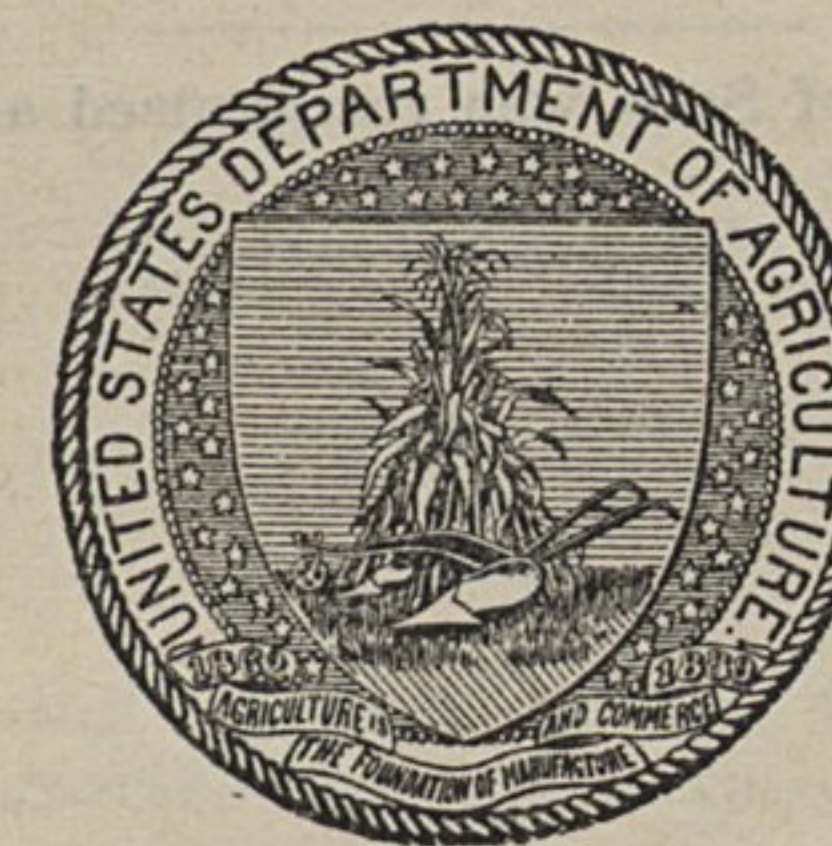
IN COOPERATION WITH THE NORTH CAROLINA DEPARTMENT OF AGRICULTURE
AND THE AGRICULTURAL EXPERIMENT STATION

SOIL SURVEY OF CAMDEN AND CURRITUCK
COUNTIES, NORTH CAROLINA

BY

S. O. PERKINS, IN CHARGE, W. D. LEE, AND G. B. SHIVERY,
OF THE U. S. DEPARTMENT OF AGRICULTURE, AND
S. F. DAVIDSON, OF THE NORTH CAROLINA
DEPARTMENT OF AGRICULTURE

[Advance Sheets—Field Operations of the Bureau of Soils, 1923]



WASHINGTON
GOVERNMENT PRINTING OFFICE
1926

[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.]

II

CONTENTS

	Page
Description of the area.....	25
Climate.....	27
Agriculture.....	28
Soils.....	32
Elkton fine sandy loam.....	35
Elkton very fine sandy loam.....	36
Elkton silt loam.....	37
Elkton silty clay loam.....	38
Moyock fine sandy loam.....	40
Moyock very fine sandy loam.....	41
Bladen loam.....	42
Bladen silt loam.....	42
Bladen silty clay loam.....	44
Norfolk loamy sand.....	45
Norfolk loamy fine sand.....	45
Norfolk sandy loam.....	47
Norfolk fine sandy loam.....	47
Ruston fine sandy loam.....	48
Keyport very fine sandy loam.....	49
Portsmouth sandy loam.....	50
Portsmouth fine sandy loam.....	50
Portsmouth loam.....	51
Hyde loam.....	52
Peat.....	52
Peaty muck.....	53
Swamp.....	54
Tidal marsh.....	55
Coastal beach.....	55
Summary.....	55

ILLUSTRATIONS

	Page
FIGURE	
Fig. 2.—Sketch map showing location of the Camden and Currituck Counties area, North Carolina.....	25

MAP

Soil map, Camden and Currituck Counties sheet, North Carolina

III

SOIL SURVEY OF CAMDEN AND CURRITUCK COUNTIES, NORTH CAROLINA

By S. O. PERKINS, in Charge, W. D. LEE and G. B. SHIVERY, of the U. S. Department of Agriculture, and S. F. DAVIDSON, of the North Carolina Department of Agriculture

DESCRIPTION OF THE AREA

Camden and Currituck Counties are situated in the extreme north-eastern part of North Carolina. The area is bounded on the north by the Virginia State line, on the east by the Atlantic Ocean, on the south by the Albermarle Sound, and on the west by the Pasquotank River. Currituck County borders the Atlantic Ocean and Camden County lies along the Pasquotank River. Points along the Virginia line are about 25 miles south of Norfolk, Va. The area of the two counties comprises 512 square miles, or 327,680 acres, Camden County having an area of 220 square miles and Currituck County 292 square miles.

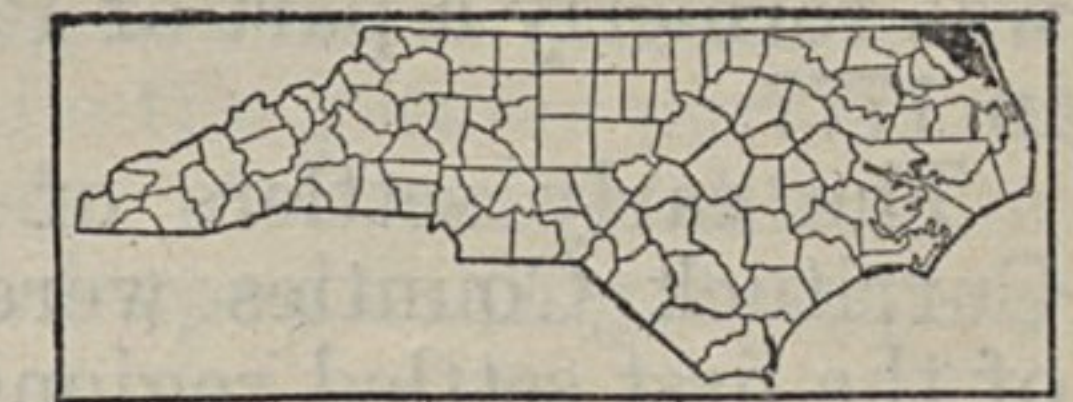


FIG. 2.—Sketch map showing location of the Camden-Currituck Counties area, North Carolina

Physiographically the area is mainly a low, level plain, slightly dissected by streams and deeply indented by Currituck Sound and several wide tidal estuaries. The greater part of the area is so level that no appreciable difference in elevation can be noticed by the eye, and in many places it is even difficult to determine the direction of the flow of water in the streams.

Along Currituck Sound, beginning a short distance north of Currituck and extending south to Point Harbor in Currituck County, is a low ridge, bordered by either swamp or water. Another ridge of much smaller extent lies on the west side of Great Swamp, beginning near Shawboro and extending south to a point about 2 miles below Shiloh. This ridge is intersected by two streams, Indiantown and Cow Creeks. A strip of typical Coastal beach, varying in width from about one-fourth to 1 mile, lies between Currituck Sound and the Atlantic Ocean. The surface of this land strip is very uneven, consisting of many small hummocks of sand and a few larger dunes rising to heights of 40 or 50 feet. These are constantly being shifted by the winds; it is said that they are moving southward at the rate of about 100 feet per year.

Camden and Currituck Counties embrace a large part, probably one-fifth of the Dismal Swamp, and in addition they include "The Desert," which is an outlier or arm of the Dismal Swamp. The Great Swamp, covering about 35 square miles in the central part of the area, is not considered a part of the Dismal Swamp, although it is connected to the Dismal Swamp by a narrow neck of swamp land along Indiantown Creek.

On account of their low position, the natural surface drainage of these counties is imperfectly established, except in the two ridges previously mentioned and over a few narrow strips bordering some of the streams or swamp areas. The natural drainage channels are but partly developed; some broad expanses of level land are not penetrated by streams. Water stands on the surface for a long time after heavy rains. The principal drainage ways are the Pasquotank River, North River, Run Swamp Canal, and Indiantown Creek in Camden County, and Run Swamp Canal, Tull Creek, and North and Northwest Rivers in Currituck County.¹

The greater part of the surface of the area lies from 2 to 10 feet above sea level. In many places the upland descends to fresh water, which is practically at sea level. The Dismal Swamp, lying 20 feet above sea level on the North Carolina-Virginia line, on the highway along the Lake Drummond Canal, is considerably higher than any other part of the area covered by the present survey, except the sand dunes along the ocean beach.

Currituck County was formed in 1662, when the Albemarle Precinct, embracing a large area in the northeastern part of the State, was divided into counties. The territory included in Camden County was formerly a part of Pasquotank County, from which it was taken in 1777.

The early settlers of the region now comprising Camden and Currituck Counties were of English descent. This area was one of the first settled regions of the United States.

According to the 1920 census, Camden County had a population of 5,382 and Currituck County 7,768, all which was classed as rural, as there is no town in either county exceeding 2,500 in population. There are practically no persons of foreign nationality in the area. According to the census the negro population of Camden County in 1920 was 2,125 and of Currituck County, 2,638. The average number of persons per square mile is 24.5 in Camden County and 24.9 in Currituck County. The distribution of the population varies greatly, since there are large areas of swamp and undeveloped land which are not inhabited. The most thickly settled sections are in the central and southern parts of both counties, the southern part of Currituck County being especially thickly settled.

The largest town in Camden County and the only incorporated town in the area, is South Mills, which has a population of 373. Camden, the county seat, is not incorporated. Shiloh and Old Trap are other settlements in Camden County. In Currituck County, Moyock, with a population of 240, is the largest and most important town. Currituck, the county seat, and Poplar Branch, Powells Point, Coinjock, and Jarvisburg are country settlements.

Railroad transportation is good only over a part of the area, but water transportation is very good for many parts not within reach of the railroad. The Norfolk Southern Railroad from Norfolk to various cities in North Carolina crosses the northwest corner of Currituck County and runs across Camden County. The Lake

¹ Practically all the drainage now established is artificial, consisting of canals and numerous small ditches, ditches being usually constructed at intervals of 600 to 1,000 feet.

Drummond Canal crosses Camden County in a general north and south direction, connecting the waters of the Pasquotank River with Deep Creek in Virginia and thus with the southern branch of the Elizabeth River, a short distance south of Norfolk. A canal connects North River and Currituck Sound, the two forming a part of the Inland Waterway Canal system along eastern North Carolina and Virginia. The Pasquotank and North Rivers and Currituck Sound are navigable waters, and many landings for boats are established. The railroad and these navigable streams furnish fairly good transportation for the area.

There are three State roads in the area which are kept in good repair, but are hard surfaced only in spots. The other public roads are fairly good in dry weather, but holes and ruts are easily formed in wet seasons.

Most of Camden County and the northern part of Currituck County have rural mail delivery routes. Telephone lines extend over the more thickly populated sections of the area. Consolidated schools are located in a few places where the population is most dense, and in sparsely settled regions a sufficient number of public schools are located to accommodate the population.

The principal markets for the staple agricultural products are Elizabeth City, N. C., and Norfolk, Va., while the greater part of the truck crops are shipped to northern markets. A considerable number of the inhabitants depend for a livelihood upon fishing, trapping, and hunting.

CLIMATE

There are no Weather Bureau stations in either Camden or Currituck Counties, so that climatic data for this area are taken from the records of the Weather Bureau station at Elizabeth City, in Pasquotank County. The station lies just across the Pasquotank River to the west of Camden County, and its records cover a period of 10 years, long enough to establish a fairly dependable mean.

The mean annual temperature at Elizabeth City is 60.1° F. The winter mean is 43° F. and the summer mean 76.3° F. The highest recorded temperature is 104° F., reached both in June and August, and the lowest —3° F., reached in December. The date of the latest recorded killing frost in the spring is May 6 and that of the earliest in the fall October 14. The average date of the last killing frost in the spring is April 7 and that of the first in the fall October 30. This gives an average growing season of 206 days.

The average annual precipitation at this station is 45.55 inches. The rainfall is well distributed through the year, the amount being about the same for the winter and spring months, lightest during the fall months, with an average of 7.65 inches, and heaviest during summer. The precipitation in the driest year on record (1921) amounted to 39.15 inches and in the wettest year on record (1917) to 58.97 inches. The average annual snowfall is 5.6 inches.

The table following, compiled from the records of the Weather Bureau station at Elizabeth City, Pasquotank County, gives the more important climatic data of this region in detail by months.

Normal monthly, seasonal, and annual temperature and precipitation at Elizabeth City, Pasquotank County

[Elevation, 8 feet]

Month	Temperature			Precipitation			
	Mean	Absolute maximum	Absolute minimum	Mean	Total amount for the driest year (1921)	Total amount for the wettest year (1917)	Snow, average depth
	° F.	° F.	° F.	Inches	Inches	Inches	Inches
December.....	42.6	75	-3	3.76	3.45	3.47	2.1
January.....	43.4	78	-2	4.12	1.50	4.06	1.5
February.....	43.1	79	5	3.58	4.47	2.33	.7
Winter.....	43.0	79	-3	11.46	9.42	9.86	4.3
March.....	51.2	84	17	3.79	2.95	4.51	1.3
April.....	58.4	94	22	3.33	3.15	4.35	.0
May.....	66.6	98	32	4.11	7.35	3.11	.0
Spring.....	58.7	98	17	11.23	13.45	11.97	1.3
June.....	73.6	104	46	4.75	2.45	9.00	.0
July.....	78.0	101	50	6.34	5.90	10.32	.0
August.....	77.4	104	50	4.12	4.43	5.50	.0
Summer.....	76.3	104	46	15.21	12.78	24.82	.0
September.....	70.7	98	39	3.74	1.18	8.22	.0
October.....	63.8	94	29	1.89	.45	3.20	.0
November.....	52.0	86	19	2.02	1.87	.90	.0
Fall.....	62.2	98	19	7.65	3.50	12.32	.0
Year.....	60.1	104	-3	45.55	39.15	58.97	5.6

AGRICULTURE

The following table shows the acreage and production of the principal crops in Camden and Currituck Counties, as reported by the Bureau of the Census:

Acreage and production of leading crops in 1879, 1889, 1899, 1909, 1919, and 1924¹

CAMDEN COUNTY

Year	Corn		Oats		Cotton		Sweet potatoes		Potatoes	
	Area	Production	Area	Production	Area	Production	Area	Production	Area	Production
	Acres	Bushels	Acres	Bushels	Acres	Bales	Acres	Bushels	Acres	Bushels
1879.....	23,663	295,447	1,008	8,854	2,670	823	377	26,823	-----	14,812
1889.....	22,634	244,353	1,157	9,585	4,155	1,240	535	34,585	302	15,096
1899.....	21,587	254,890	326	3,040	3,060	1,394	497	27,331	196	16,527
1909.....	18,587	167,795	260	3,498	5,190	2,197	704	59,951	914	89,973
1919.....	16,067	225,955	52	511	5,172	2,838	818	78,613	1,047	89,845
1924.....	14,013	183,267	(1)	(1)	7,170	2,866	307	25,876	1,421	148,632

CURRITUCK COUNTY

1879.....	23,310	324,819	267	2,734	316	139	462	42,902	-----	6,702
1889.....	22,243	257,066	806	7,892	1,182	377	953	66,164	384	24,705
1899.....	19,316	269,540	210	2,290	1,210	518	1,044	70,862	704	58,563
1909.....	17,135	176,177	97	944	1,630	547	3,413	246,702	1,493	105,984
1919.....	20,815	241,707	27	494	2,085	1,273	3,385	376,536	1,154	129,134
1924.....	10,458	140,749	(1)	(1)	3,594	1,561	3,167	289,544	2,704	309,387

¹ The data for 1924 are taken from the preliminary announcement of the Bureau of the Census and are subject to correction. The item of oats was not included in this announcement.

The territory now included in Camden and Currituck Counties was one of the first places to be settled in America. The early settlers occupied the ridge land along Currituck Sound and from this nucleus gradually spread to the interior. The first crops grown were corn, rice, wheat, and hemp. Hogs, sheep, and cattle were raised. From the earliest time agriculture has been the chief industry of these counties, but fishing, oystering, and lumbering have each been valuable resources.

During the period covered by the census figures, in addition to the crops listed, considerable quantities of forage crops, apples, peaches, and vegetables were grown. Wheat was grown on 562 acres in the area in 1879, but its acreage at present is negligible. Rice has been grown in the past; in 1899 it occupied 1,618 acres in Camden County and 76 acres in Currituck County, but none was reported in the area by the later censuses.

The agriculture at present consists of the production of cotton, potatoes, and sweet potatoes as the principal cash crops, and corn, soy beans and other legumes, and coarse forage as the staple subsistence crops.

Corn is the most widely distributed crop. Its acreage in each county generally just about equals the combined acreage of all other crops. In Camden County in 1919 it was grown on 16,067 acres, yielding 225,955 bushels, while in Currituck County it occupied 20,815 acres, yielding 241,707 bushels. Preliminary figures announced by the same office made the acreage in 1924, 14,013 and 10,458 acres, respectively. It is the principal subsistence crop, being used for bread, for feeding work stock, and for fattening hogs.

Cotton is the staple money crop. In 1919 it occupied 5,172 acres in Camden County, producing 2,838 bales, while in Currituck County it was planted on 2,085 acres, producing 1,273 bales. Preliminary figures for 1924 show about a 50 per cent increase in acreage over 1919. Cotton is grown throughout Camden County and through the northern and central parts of Currituck County. The principal varieties are Simpkins and King Small Boll, which are considered early varieties. Very little long-staple cotton is grown in this area.

Sweet potatoes are primarily a cash crop. In Camden County in 1919 there were 818 acres producing 78,613 bushels, and in Currituck County 3,385 acres yielding 376,536 bushels. Sweet potatoes are grown on the more sandy soils, particularly in the point of Currituck County and on Knott Island. The principal varieties in the past have been the Big Stem Jersey and Red Jersey as the main shipping potatoes, but at present there is a growing tendency to produce Nancy Hall, Triumph, and Cuban "Yam." Sweet potatoes grown for shipping reach the northern markets from several days to weeks earlier than those grown farther north.

Early potatoes also are grown as a money crop, the combined acreage reported for the two counties by the census for 1924 being somewhat larger than the acreage of sweet potatoes. There has been a considerable increase in the acreage in potatoes since 1919, especially in Currituck County, where it more than doubled. The average yield in 1924 was somewhat over 100 bushels per acre.

During the last 13 years soy beans have been introduced in these counties and the acreage has steadily increased. To use the language of many farmers, soy beans have been their salvation. By 1919 there were 4,309 acres planted in Camden County, yielding 44,308 bushels, and in Currituck there were 3,656 acres, yielding 37,642 bushels. Preliminary figures, 1924, are not available for this crop. Part of the crop is sold for cash, a large part is crushed and fed to cattle, and some is "hogged off"; that is, the hogs are turned into the fields and either eat the entire crop or the part left on the ground after harvesting the beans.

In Camden County in 1919 there were 6,276 acres of coarse forage grown, 1,757 acres of legumes cut for hay, 427 acres of grain cut green, and 100 acres of alfalfa. In Currituck County there were 520 acres of cultivated grasses, 1,347 acres of legumes cut for hay, 229 acres of grain cut green, 47 acres of coarse forage, and 101 acres of wild grasses.

In addition to the staple crops, some apples, peaches, pears, plums, and cherries are grown. There are two large pecan groves and a few small ones in these counties. Garden vegetables are produced around practically every home, and a few acres of English peas are grown for the early market.

There are a few purebred hogs, cattle, and sheep in this area, but most of the cattle and hogs are of mixed breeding. Some of the hogs are of the Duroc-Jersey breed. According to the census there were 288 beef cattle, 1,621 dairy cattle, 3,627 horses and mules, 19,587 hogs, and 3,007 sheep in the two counties in January, 1920. There is a surplus of hogs, cattle, and sheep after the farm homes are supplied, and this is sold either in the local markets or outside markets.

The following table gives the value of agricultural products of the two counties, as reported by the 1920 census:

Value of agricultural products, as reported by the 1920 census

Classes	Camden County	Currituck County	Classes	Camden County	Currituck County
Cereals.....	\$442,706	\$472,197	Livestock and products—Con.		
Other grains and seeds.....	157,195	132,465	Dairy products, excluding		
Hay and forage.....	88,217	83,144	home use.....	\$4,912	\$1,375
Vegetables.....	343,989	943,980	Poultry and eggs.....	40,796	51,971
Fruits and nuts.....	6,530	1,890	Wool, mohair, and goat hair.....	1,918	929
All other crops, principally			Total.....	1,756,103	2,011,101
cotton.....	592,111	265,176			
Livestock and products:					
Animals sold and slaugh-					
tered ¹	77,729	57,974			

¹ Estimated. Not reported by 1920 census.

Most of the farmers wait until spring to plow their land and in many cases plow when the soil is too wet. Shallow plowing is the general practice. On some farms a furrow is opened up with a turning plow or middle buster, fertilizer is put in and covered by throwing two furrows together, the seed is planted on top of the ridge, and the rest of the breaking is done as the crop is cultivated. The ideal seed bed can not be prepared in this way, and yields are lower than where the fields are thoroughly plowed and harrowed before planting.

Crops are planted in ridges on most of the soils of the area, owing to the flat surface and wet condition of the land. Ridging is practiced less on the sandier soils, except for potatoes, which are grown on small ridges. It seems necessary to cultivate all the flat fine-textured soils of the area in ridges to prevent crops from drowning out in wet seasons. A few of the best farmers use a three-year crop rotation, consisting of corn the first year, soy beans the second, and cotton the third year.

The farmers recognize that the well-drained, light, sandy soils, such as the Norfolk and Ruston types, are best suited to the growing of sweet potatoes and English peas, and that the well-drained dark-colored to black soils, such as the Portsmouth sandy loam and fine sandy loam, are well adapted to potatoes. The Bladen and Hyde soils are considered the best in the area for the production of corn and soy beans. The Ruston soils, the sandy loam and the fine sandy loam of the Norfolk, and the lighter textured and better drained types of the Elkton and Moyock series are selected for the growing of cotton.

A majority of the farms are improved with fairly good buildings, most of which are painted. The barns are generally small and are not as carefully constructed as the houses. Most of the farms are equipped with implements, including 2-horse turning plows, disk plows, cultivators, corn planters, and cotton planters. A number of 1-horse plows of various designs are used in cultivating cotton and corn. There are also a few tractors in the area. The work stock consists generally of mules with a few horses, all of which are of medium size.

Commercial fertilizers are used on most all the soils of the area. According to the United States census, \$116,674 was spent for fertilizers in Camden County in 1919, and \$95,629 in Currituck County. Most of the fertilizers are bought ready mixed. About 83 per cent of the farms in Camden County reported the use of fertilizer in 1919, and about 67 per cent of the farms in Currituck County. The grades in general use are 8-4-4,² 8-3-3, 7-5-5, and 6-5-4. The 7-5-5 and 6-5-4 are used chiefly for potatoes and truck crops. From 500 to 1,200 pounds per acre are used for potatoes. Considerable lime is used at the rate of 1,000 to 2,000 pounds per acre.

Practically all farm labor is colored and is getting scarce on account of the demands of the fishing industry.³ In addition, a great many have left the farms for public work, and others have recently moved to northern States because of the higher wages offered there. In 1919, 43 per cent of the farms in Camden County reported an expenditure for labor of \$48,756, or an average of \$130 per farm reporting. During the same year 37.7 per cent of the farms in Currituck County reported an expenditure for labor of \$83,164, or an average of \$224 per farm. Ordinary farm laborers receive from \$1.50 to \$2 per day with part board. The monthly wage ranges from \$30 to \$40 with board.

² Percentages, respectively, of acid phosphate, potash, and ammonia.

³ The improvement in marketing facilities and the general organization of the fishing industry along the Atlantic seaboard in recent years has attracted many workers from other lines of work. The coast counties of North Carolina will no doubt be further affected by the recent opening of New Inlet through the sand-barrier reef inclosing the Albemarle and Pamlico Sounds off the North Carolina coast, for the purpose of giving free access of sea fishes to these sounds and tributary rivers. This work was undertaken and completed by the State for the improvement of the fishing industry.

The farms range in size from a few to several hundred acres. The total number of farms in Camden County in 1919 was 875, comprising 37.5 per cent of the area of the county, the average size being 60.4 acres per farm, of which 40.4 acres was improved land. In Currituck County 47.5 per cent of the total area was reported in 984 farms, averaging 90.3 acres per farm, of which 51.4 acres was improved land.⁴

From 1880 to 1920 there was a gradual tendency toward the tenant system. In 1880 the percentage of farms operated by owners was 66 per cent in Camden County and 70 per cent in Currituck County. In Camden County in 1920, 41.9 per cent of the farms were operated by owners, 57.5 per cent by tenants, and 0.6 per cent by managers. In Currituck County 64 per cent of the farms were operated by owners, 35.6 per cent by tenants, and 0.4 per cent by managers.

Land values range from \$10 to \$150 an acre. The average value of land in Camden County in 1920, as reported by the census, was \$38.73 an acre and in Currituck County \$31.18 an acre.

SOILS

The soils of Camden and Currituck Counties may be grouped as light-colored mineral soils, dark-colored imperfectly drained soils with high organic matter content, and Peat. The light-colored mineral soils, which are dominantly light gray to almost white in the surface horizon, constitute the largest area of agricultural soils. The Peat covers most of the Dismal Swamp and some of the other swamps, while the dark-colored soils commonly lie between the light-colored soils and the areas of Peat. The dark color of the soils is due to the quantity and to the stage of decomposition of the organic matter they contain.

The soils range from slightly acid to strongly acid in character. All of them respond readily to applications of lime. There is no free carbonate of lime in any of these soils, and the only evidence of the existence of parent materials containing carbonates at moderate depths below the surface is observed along the Lake Drummond Canal, where shells have been excavated.

The Peat deposits consist essentially of organic matter with little change by weathering since they have been accumulated. The other soils of the area have been weathered in varying degrees, but only small areas lie high enough to have passed through all the stages of a normal course of development. These consist of a few spots of sandy soils in the southern end of Currituck County and of narrow strips adjacent to some of the swamps. The formations from which the mineral soils are derived consist for the most part of beds of unconsolidated clay and fine sandy clay and locally of sandy clay, all of recent geologic age. Oxidation and aeration of this material has been slight, and many of the soils, particularly the heavier types, appear to represent the material as laid down originally by the ocean

⁴ The preliminary announcement of the census of agriculture for 1925, which is subject to correction, shows a slight increase in the number of farms and total acreage of land in farms in Camden County and a decrease in Currituck County, the data being as follows: Camden County, 938 farms, containing 55,547 acres; Currituck County, 873 farms, containing 57,829 acres.

without much translocation of the finer material to any considerable depth in the subsoil. The mottled condition of most of the subsoils and the light color of the surface soils are largely owing to the presence of excessive moisture as the result of imperfect drainage. In the case of the types of dark color, organic matter, accumulated through the growth and decay of vegetation, has become more or less mixed with the mineral components of the soils.

On a basis of the arrangement of layers of material in the vertical section there are four distinct groups of soils in this area. The first group covers a large part of the area and includes the soils of the Elkton, Moyock, and Bladen series. The Elkton and Bladen soils are characterized by heavy, usually tough and plastic, mottled subsoils. The Moyock series has somewhat the appearance of the Elkton, but differs from it in that the subsoil is lighter in color and is very friable in structure.

The soils of the second group are developed principally on a narrow strip in the southern end of Currituck County, on a ridge running from a point just north of Shawboro nearly to Old Trap on the west side of Great Swamp, and on Knott, Church, and Bells Islands. This group embraces the sandier soils of the two counties, such as the Norfolk and Ruston types. These soils are well drained, have light surface soils, and a friable subsoil of either loamy or friable sandy clay of yellow or reddish-yellow color.

The third group comprises the black to dark-gray soils of the Portsmouth and Hyde series, which are naturally poorly drained. The Portsmouth types differ from the Hyde in depth and content of organic matter, and in having a lighter textured subsoil than the Hyde. The fourth group includes the vast areas of Peat and Peaty muck occurring in the Dismal Swamp and in other parts of the area. This material represents the accumulation of organic matter for centuries and, where the conditions are undisturbed, such accumulation is still going on.

The soils of the area are grouped into series according to the detailed characteristics of the soil profile and the characteristics and processes of accumulation of the parent material. The series are subdivided into types on the basis of the texture, which depends on the relative contents of clay, silt, very fine sand, fine sand, and sand of the surface soil. The soils of the area have been classed in the Elkton, Moyock, Bladen, Norfolk, Ruston, Keyport, Portsmouth, and Hyde series, which include 19 types and 3 phases. In addition to these there are extensive areas of miscellaneous material classified as Peat, Peaty muck, Tidal marsh, Swamp, and Coastal beach.

The types in the Elkton series have light-gray to gray or ashy-colored surface soils and a subsurface layer of light-gray material. The subsoil is a mottled light-gray, yellow, and brown or rusty-brown, heavy, plastic sandy clay, or heavy, tough clay. In places below 30 inches the subsoil is lighter in color and structure. The Elkton fine sandy loam, very fine sandy loam, silt loam, and silty clay loam, with a low phase, are recognized in this area.

The Moyock series includes types characterized by light-gray to slightly grayish brown surface soils, with a light-gray to grayish-yellow subsurface layer. The typical subsoil is a mottled light-gray

and brownish-yellow friable loam to sandy loam having a mellow structure. At 30 to 36 inches a very friable material of a light-gray or yellowish color is usually encountered. This series differs essentially from the Elkton in having a very friable subsoil, a more yellow color in both soil and subsoil, and slightly better drainage conditions. The Moyock fine sandy loam and very fine sandy loam are mapped.

The types included in the Bladen series have grayish-brown to rather dark brown surface soils, and a mottled steel-gray and brownish-yellow plastic subsoil. This series is closely associated with the Elkton, but differs from it in having darker colored surface soils and a more plastic subsoil. It occupies a slightly lower position than the Elkton. The Bladen loam, silt loam with a light-subsoil phase, and silty clay loam with a swamp phase are mapped.

The Norfolk series comprises types with light-gray to grayish-yellow surface soils and a yellow friable subsoil. These soils are the best drained types in the area. The Norfolk loamy sand, loamy fine sand, sandy loam, and fine sandy loam are mapped.

The types in the Ruston series differ from those of the Norfolk in having a brownish cast to the surface soil and a reddish-yellow or yellowish-red friable subsoil. Only one type of this series, the Ruston fine sandy loam, is mapped in the present survey.

The types in the Keyport series resemble those of the Norfolk down through the second horizon, below which the subsoil becomes mottled gray, yellow, and brown. The Keyport soils occur in narrow belts along some of the swamps. They are comparatively well drained. The Keyport very fine sandy loam is developed in this area.

The Portsmouth series includes types with very dark gray or black surface soils, underlain by a mottled light-gray and yellow or rusty-brown, friable subsoil, which is slightly sticky. These soils are for the most part poorly drained, occurring in depressions and in low positions. The Portsmouth loam, fine sandy loam, and sandy loam are mapped.

Types of the Hyde series are characterized by black surface soils high in organic matter. This black material may extend to a depth of 3 feet, but generally rests at about 14 to 24 inches on a steel-gray silty clay, slightly mottled with brown or rusty brown. The Hyde loam is the only type mapped in this area.

Peat consists of a more or less spongy mass of partly decomposed vegetation of brown color, and containing very little mineral matter.

Peaty muck differs from Peat mainly in that organic remains have decomposed to a fine state approximating that of Muck. The mineral content, however, is only slightly greater than in the case of Peat.

Tidal marsh represents the low-lying areas covered with salt water the greater part of the time.

Coastal beach includes those areas of sand or fine sand developed along the ocean front.

Swamp includes those areas of variable material, color, texture, and structure that are subject to permanent fresh-water inundation.

In subsequent pages of this report the soils of the area are described in detail and their relation to agriculture is discussed. Their distribution is shown on the accompanying soil map. The table below shows the actual and relative extent of each type mapped in the area:

Areas of different soils

Soil	Acres	Per cent	Soil	Acres	Per cent
Peat.....	75,968	29.3	Portsmouth loam.....	6,976	2.1
Shallow phase.....	19,968		Keyport very fine sandy loam.....	6,208	1.9
Tidal marsh.....	33,600	10.3	Elkton fine sandy loam.....	5,568	1.7
Elkton very fine sandy loam.....	31,488	9.5	Elkton silty clay loam.....	2,688	1.6
Elkton silt loam.....	21,632	6.6	Low phase.....	2,624	
Bladen silt loam.....	14,720	5.6	Moyock very fine sandy loam.....	3,776	1.2
Light-subsoil phase.....	3,648		Hyde loam.....	3,520	1.1
Norfolk loamy fine sand.....	18,048	5.5	Norfolk sandy loam.....	2,688	.8
Bladen silty clay loam.....	4,416	4.2	Norfolk fine sandy loam.....	1,984	.6
Swamp phase.....	9,600		Ruston fine sandy loam.....	1,920	.6
Moyock fine sandy loam.....	13,120	4.0	Norfolk loamy sand.....	1,536	.5
Peaty muck.....	11,776	3.6	Bladen loam.....	1,472	.5
Portsmouth fine sandy loam.....	11,072	3.4	Portsmouth sandy loam.....	1,472	.5
Swamp.....	8,192	2.5			
Coastal beach.....	8,000	2.4	Total.....	327,680	-----

ELKTON FINE SANDY LOAM

The surface soil of the Elkton fine sandy loam in wooded areas is gray to brownish gray for the first 2 or 3 inches. The surface in plowed fields is a gray to light-gray fine sandy loam 6 to 9 inches deep. The upper subsoil is a gray fine sand, streaked with lighter gray and slightly mottled with yellow and brown, grading into the subsoil proper, which is a heavy fine sandy clay or clay mottled light gray, yellow, and brown. Thin layers of fine sand are common in the subsoil. In places there are only two horizons in the profile, the light-gray surface soil and the heavy, tough, mottled gray, yellow, and brown subsoil; in other places the surface is dark gray, and the subsoil steel gray, slightly mottled with yellow and brown. The material at depths approximating 3 feet in places, is a friable sandy clay or sandy clay loam. Included with this type are small spots of Elkton very fine sandy loam and Moyock fine sandy loam.

This is one of the types of small extent. It is confined to small bodies in the extreme northern part of the area, the largest lying immediately south of Moyock. The topography is flat and the natural drainage poor. Probably one-half of the type is under cultivation, the rest being forested to sweet gum, pine, beech, tupelo (black or sour gum), holly, and oak.

Where enough drainage ditches have been dug, corn, soy beans, and potatoes are grown with satisfactory results. May peas, cotton, and vegetables are minor crops. Corn yields 15 to 25 bushels, averaging about 20 bushels per acre, soy beans 10 to 20 bushels, and potatoes 50 to 150 bushels.

Complete fertilizers, 8-3-3, 6-5-5, and 7-5-5 are in general use. From 200 to 400 pounds per acre of the 8-3-3 mixture is applied in growing corn or soy beans, and from 500 to 800 pounds of the higher grades for potatoes and English peas. This land sells at \$20 to \$50 an acre.

ELKTON VERY FINE SANDY LOAM

The Elkton very fine sandy loam consists of a gray or light-gray to almost white very fine sandy loam, 6 to 9 inches deep, underlain by a light-gray, mottled yellow and rusty-brown, rather heavy but friable very fine sandy clay loam, 12 to 20 inches in depth. The lower subsoil is a light-gray, mottled yellow and brown, heavy stiff clay. In places the surface soil overlies the heavy clay subsoil and there are only two soil horizons. Below 3 feet the material is generally less mottled and becomes more friable in structure. In most places the tough clay subsoil contains thin layers of light-gray very fine sand. In slightly depressed areas the surface is darker and the subsoil is a steel gray slightly mottled with yellow and brown. Included with this type are small spots of Elkton silt loam, Elkton fine sandy loam, Moyock fine sandy loam, and Bladen silt loam, the extent of which did not warrant separate mapping. The Elkton very fine sandy loam resembles so closely the Keyport very fine sandy loam that the boundary between them is more or less arbitrary.

This is one of the more extensive and important types in the area. It has its greatest development in the southern part of Camden County, in the vicinity of Camden and Bartlett, south of Shiloh, between Lambs Corner and South Mills, in the vicinity of Sligo, Guinea Hill Church, and Gregory.

The surface is flat and low, the general elevation ranging from 3 or 4 feet to 10 feet above sea level. The drainage is naturally poor, and the land can not be used for farming without artificial drainage. Small open ditches at intervals dividing the land up into fields of 3 to 5 acres each are used to drain this soil.

About 50 per cent of the Elkton very fine sandy loam is under cultivation, and probably 15 per cent of the rest is cleared and used for pasture. The remainder is forested chiefly with sweet gum, tupelo, pin oak, white oak, water oak, and holly. Practically all the wooded areas show evidence of cultivation at one time, probably before the Civil War. In the early days the soil was farmed until the land no longer gave profitable returns and then abandoned and new land cleared, allowing the so-called worn-out land to revert to forest.

Corn, soy beans, and cotton are the principal crops. English peas, crimson clover, potatoes, and vegetables are minor crops. Some of the best farmers raise purebred beef cattle and sheep, and every farmer raises hogs and milk cows to supply the home needs. The surplus hogs are slaughtered and sold in Elizabeth City. Corn yields 10 to 30 bushels, averaging about 15 bushels per acre, soy beans 10 to 20 bushels, cotton one-fourth to 1 bale, averaging one-half bale, potatoes 40 to 150 bushels, English peas 75 to 100 baskets, and alfalfa one-half ton to 3 tons per acre per season.

This land is usually limed at the rate of 1,000 to 1,500 pounds of burnt lime or 1 or 2 tons of ground limestone or shell lime per acre. Corn following soy beans receives 300 to 400 pounds of acid phosphate per acre. From 200 to 300 pounds of an 8-3-3 mixture is used for soy beans. Cotton receives 400 to 600 pounds of 8-3-3 mixture, to which has been added one bag of kainit to two bags of the fertilizer. Fertilizer analyzing 6-3-5 or 7-5-5 is generally used for potatoes at the rate of 800 to 1,000 pounds per acre.

Some of the land of this type is allowed to lie idle or rest for a season, but most of the cultivable land is farmed every year. Plowing usually is done in early spring as soon as the moisture conditions will permit. If plowed too wet the soil clods badly and then it is almost impossible to prepare a good seed bed. According to local information the introduction of soy beans has greatly benefited the land; and the yield of corn, formerly below 10 bushels per acre, has been increased considerably. An increasing number of farmers who grow alfalfa, clover, and soy beans in rotation with other crops report an increase in yields above those obtained under the old methods.

This land is valued at \$15 to \$60 an acre, depending upon the state of improvement, drainage conditions, and proximity to good roads and other transportation facilities.

The most essential step in improving this soil is drainage. The land is so flat that, even where well ditched, ridging up the crops is necessary to keep them from drowning out in rainy weather. After the land has been drained it should be plowed deep and thoroughly limed. A systematic crop rotation should be worked out, more soy beans, clover, and vetch should be grown, and an occasional crop turned under, together with all the available stable manure, pine straw, and leaf mold. By proper drainage, liming, and the incorporation of large quantities of vegetable matter, this soil type can be built up to a fairly high state of cultivation.

ELKTON SILT LOAM

In plowed fields the surface soil of the Elkton silt loam consists of 6 to 8 inches of gray to brownish-gray compact silt loam, which on drying thoroughly becomes light gray or almost white. In forested areas the first inch or two is dark in color from organic matter. The subsoil is a gray, mottled yellow and brown, tough, heavy silty clay to clay, which extends to a depth of 28 to 36 inches and is underlain by a mottled gray, yellow, and brown, rather friable but sticky, fine sandy clay, becoming lighter in texture with depth. The substratum is a fine sand or sandy loam.

In most places the subsoil shows very thin layers of gray very fine sand. In spots the surface is dark gray and the subsoil is a steel-gray or dark-gray, heavy plastic clay, which may or may not show mottlings of yellow and brown. Along the State road south of Moyock the surface soil is grayish brown to brown to a depth of 3 to 5 inches, resembling the Bladen silt loam, and the subsoil is slightly more friable than the typical Elkton silt loam. Included with this type are small bodies of Elkton very fine sandy loam and fine sandy loam.

This type is the second largest in extent of the farming soils in the two counties. It occupies large continuous areas throughout the south-central part of Camden County, being typically developed in the vicinity of Belcross, west of Shiloh, and along the Pasquotank River at Miles Point. Small areas occur northeast of South Mills. Large new farms are situated on this type in Camden County, in the vicinity of Moyock, along the State road north of Snowden, and between Gregory and Great Swamp.

The Elkton silt loam occupies uniformly flat, level, low-lying areas, ranging in elevation from about 2 feet to 6 or 8 feet above sea level. In some places there is no appreciable slope from the surface of this soil to areas of Tidal marsh. Natural surface drainage has not been established upon this type; consequently all of it is very poorly drained, and water stands over the surface after heavy rains. In order to cultivate the land it has been necessary to cut ditches at frequent intervals, usually being located to take in "cuts" of 3 to 5 acres. Owing to the heavy clay subsoil, the ditch banks stand up well. The water in the ditches moves very slowly to the natural drainage ways. Crops are occasionally drowned out or damaged on this soil by heavy rains.

There is evidence that the greater part of this type was at one time cleared and under cultivation, but at present perhaps not more than 30 per cent is farmed. The rest is forested to scattering sweet gums and clusters of pine, and supports an undergrowth of sedge grass and briars.

Corn, soy beans, and potatoes are the principal crops. Cotton is grown by a few farmers. Cabbage, onions, and other vegetables are grown for home use. Some cattle are raised and also a few sheep. Every farmer raises hogs for the home supply of meat, and there is a surplus which is sold in the local markets. Corn yields from 12 to 30 bushels per acre, averaging about 15 bushels, but a few of the better farmers obtain as much as 50 bushels per acre. Soy beans yield from 10 to 20 bushels per acre, averaging about 15 bushels; potatoes, 30 to 125 bushels, averaging about 70 bushels; and cotton, one-fourth to 1 bale, with an average of one-half bale.

The Elkton silt loam is somewhat harder to handle than the Elkton very fine sandy loam, as it clods when plowed either too wet or too dry, which makes it difficult to prepare a good seed bed. The general practice is to break the land too wet and the soil has a lifeless look and feel, due in part at least to puddling. The crops are planted on ridges to keep them from drowning out after heavy rains.

The kinds of fertilizer, the quantities used for different crops, and the land values are about the same as on the Elkton very fine sandy loam.

This type needs drainage first, better methods of handling the soil, the incorporation of organic matter, and the raising of more live-stock. Permanent pastures should be established. For this purpose a good mixture for use on this soil consists of 10 pounds herd's grass (redtop), 5 pounds alsike, and 5 pounds white clover, sown in late February or March after 1 ton to 1½ tons of ground limestone and 1 ton of stable manure per acre have been applied. Pastures established in this way have proven very satisfactory on similar soils in other parts of the State.

ELKTON SILTY CLAY LOAM

The Elkton silty clay loam consists of 3 to 5 inches of gray to light-gray silty clay loam or heavy silt, underlain by a gray, mottled with yellow and brown, heavy, stiff clay subsoil containing thin layers of light-gray fine sand. The lower part of the 3-foot section usually is a steel-gray clay slightly mottled with yellow and brown. Thin layers of light-gray fine sand are more numerous in this than

in the upper subsoil. The surface in places is gray to dark gray and the subsoil is a bluish-gray clay. These spots resemble the Bladen silty clay loam and differ from the Elkton in that the subsoil is not so plastic. Included with the type are small spots of Elkton silt loam and Bladen silty clay loam.

This type occupies a comparatively small acreage and most of it is confined to the extreme northern part of Currituck County, lying between the State Line School and Tull Bay. The surface is flat and drainage is inadequate. Water stands on the surface for considerable periods after rains and escapes mainly by evaporation, the heavy subsoil preventing the downward passage of water.

Very little of the Elkton silty clay loam is now under cultivation. Abandoned fields indicate that a much larger acreage was formerly cultivated. The difficulty of handling this heavy soil, under the conditions, has contributed to retard its development. The original tree growth, which is seen on an area in the northern part of Currituck County near the State Line School, consists chiefly of hardwoods, including oak, maple, beech, ironwood, pine, and holly. The area west of Lilly appears to have been cleared at one time and is sparsely forested to sweet gum and a few scattering pines, with an undergrowth of sedge, briars, and wild grasses. Land of this type is valued chiefly for its forest growth.

Drainage and heavy applications of lime and manure should prove beneficial on this soil and fair yields of corn and soy beans could be obtained where the land is properly handled.

Elkton silty clay loam, low phase.—The low phase of the Elkton silty clay loam represents in its present condition nonagricultural low-lying soil which can not be economically drained. Both soil and subsoil are essentially the same as in the typical Elkton silty clay loam. The greater part of this phase is covered with water most of the year. It usually grades into the Bladen silty clay loam, swamp phase, and Peat. Some patches of the swamp phase of the Bladen silty clay loam are included with this phase in mapping.

The low phase is confined to the southern end of Camden County east of Old Trap. The topography is flat and drainage is entirely lacking, the elevation being only slightly above sea level. The land is in forest, consisting chiefly of gum, holly, water oak, and maple, and its selling price depends upon the quantity and quality of the growth.

The results of mechanical analyses of samples of the soil and subsoil of the typical Elkton silty clay loam are shown in the following table:

Mechanical analyses of Elkton silty clay loam

Number	Description	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
		<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
236311	Soil, 0 to 3 inches.....	0.0	1.4	1.2	17.0	36.2	37.8	6.1
236312	Subsoil, 3 to 28 inches.....	.0	.0	.0	.8	28.2	36.1	35.1
236313	Subsoil, 28 to 36 inches.....	.1	.0	.2	1.2	37.3	32.6	28.4

MOYOCK FINE SANDY LOAM

The surface soil of the Moyock fine sandy loam consists of 6 to 8 inches of gray to light brownish yellow, mellow fine sandy loam.

The subsoil is a yellowish-gray, mottled with brown, friable fine sandy clay loam, which varies in depth from 28 to 36 inches. Usually below 30 inches it is a yellow or brownish-yellow and gray loamy fine sand, with yellow as the predominating color.

This type is one of the most varied in the area, the surface soil ranging from light gray or light brownish yellow to dark gray in color, and the subsoil from a yellow, mottled with brown and gray, loamy fine sand to a friable sandy clay in the higher, better drained places, and to a gray, slightly mottled with yellow and brown, rather heavy but friable fine sandy clay in the flatter areas. It differs from the Elkton fine sandy loam in that the subsoil is sandy and friable instead of heavy and compact. Included with this type as mapped are small areas of Elkton fine sandy loam, Elkton very fine sandy loam, Moyock very fine sandy loam, Norfolk fine sandy loam, and Portsmouth fine sandy loam and loamy fine sand.

The Moyock fine sandy loam is developed in a number of small areas scattered over the northeastern part of Currituck County and throughout the northern half of Camden County. Some of the largest bodies are situated west of Hastings Corner, east and west of South Mills, in the vicinity of Moyock and Shawboro, and south of Tull Bay.

The surface of the type is gently undulating, and natural drainage, both surface and internal, is fairly well established, except in slightly depressed situations. The open nature of the substratum favors underdrainage.

This type is not a very productive soil, but about 70 per cent of it is in cultivation. The remainder supports a forest growth consisting mainly of pine, beech, dogwood, maple, and oak, with a small admixture of hickory. The chief crops are corn, cotton, potatoes, and soy beans. Rye, peas, melons, and vegetables are minor crops. Corn yields 10 to 20 bushels per acre, with an average of about 15 bushels; cotton one-fourth to three-fourths bale; potatoes and sweet potatoes 30 to 120 bushels, averaging about 65 bushels; and soy beans 8 to 15 bushels, with an average of about 12 bushels.

This soil is much easier to handle than the Elkton fine sandy loam, but the same methods are employed on both types. Commercial fertilizers are in general use. From 300 to 400 pounds per acre of 8-3-3 or 8-4-4 mixture is applied for corn and soy beans and 400 to 600 pounds for cotton, while potatoes usually receive 600 to 1,000 pounds of a 7-5-5 fertilizer.

The Moyock fine sandy loam sells at \$15 to \$50 an acre over most of the area, but in the vicinity of South Mills, Moyock, and Shawboro it brings \$50 to \$100 an acre, the price depending mainly on the state of improvement and nearness to good roads and transportation.

This soil is deficient in organic matter, and the greater part of it is in a low state of cultivation. The organic matter can be supplied to a large extent by a systematic crop rotation, with a legume as one of the crops in the rotation and the turning under of an occasional green-manuring crop. By the adoption of good farming methods this type can be built up to a high state of productiveness.

In the following table are shown the results of mechanical analyses of samples of the soil and subsoil of the Moyock fine sandy loam:

Mechanical analyses of Moyock fine sandy loam

Number	Description	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
		<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
236319	Soil, 0 to 6 inches.....	0.2	0.8	1.3	64.2	15.8	12.6	5.1
236320	Subsoil, 6 to 18 inches.....	.0	.6	.9	49.9	10.8	23.9	13.8
236321	Subsoil, 18 to 30 inches.....	.0	.6	1.0	56.4	16.1	14.5	11.5
236322	Subsoil, 30 to 40 inches.....	.0	.0	.4	58.6	27.4	9.6	4.4

MOYOCK VERY FINE SANDY LOAM

The surface soil of the Moyock very fine sandy loam varies from a light-gray, yellowish-gray, or gray to yellowish-brown very fine sandy loam 6 to 12 inches deep. The subsoil is a light-gray and brownish-yellow heavy fine sandy loam to very friable fine sandy clay. At some depth below 30 inches it commonly passes into a yellow loamy fine sand slightly mottled with gray and brown. In places the surface soil is dark gray and the subsoil is a gray friable sandy loam to a depth of 28 or 30 inches, below which a gray or yellow and gray loamy fine sand appears. In other places the soil ranges from a very fine sandy loam to a silt loam. Included with the type are small spots of Moyock fine sandy loam, Elkton very fine sandy loam, and Portsmouth fine sandy loam. The type seems to be intermediate between the Norfolk and Elkton soils.

The Moyock very fine sandy loam is one of the less extensive types in the area. It is developed in a few bodies east and south of South Mills, northeast of Hastings Corner, and north of Indian Town. The topography is level to gently undulating, and natural drainage is fairly well established, except in depression areas or in areas associated with the Bladen or Portsmouth soils.

This type is not important agriculturally on account of its small extent. About 70 per cent of it is under cultivation, and the rest is forested, chiefly with pine, oak, holly, beech, and maple.

The same crops are grown on the Moyock very fine sandy loam as on the Elkton very fine sandy loam. Yields are about the same, fertilizer treatment the same, and the soil is handled in like manner, all crops being cultivated on ridges. Level cultivation could be practiced on this type in average seasons without danger of crops drowning out, on account of its porous soil and friable subsoil, as water readily percolates through unless the water table is so high that the water can not drain off into the drainage ways. This type is naturally better drained than the Elkton very fine sandy loam and is probably suited to a wider range of crops. It sells at \$20 to \$70 an acre, depending mainly on its location and improvement.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Moyock very fine sandy loam:

Mechanical analyses of Moyock very fine sandy loam

Number	Description	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
		<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
236357	Soil, 0 to 7 inches.....	0.0	0.8	0.7	7.3	50.4	32.1	8.6
236358	Subsoil, 7 to 12 inches.....	.0	.2	.8	21.2	40.2	27.3	10.1
236359	Subsoil, 12 to 36 inches.....	.0	.4	.8	12.4	52.0	23.3	11.1

BLADEN LOAM

The surface soil of the Bladen loam consists of 6 to 10 inches of brown to brownish-gray loam to fine loam. The subsoil is a mottled steel-gray, yellow, and brown plastic clay, continuing to a depth of 3 feet or more.

Slight variations occur in this type. Thus, northwest of Pierceville the surface is a fine loam to silt loam with a thick subsurface horizon, and the subsoil is a drab-gray brittle silty material and does not become heavy and plastic until a depth of 30 inches has been reached. If these areas had been larger they would have been mapped as Bladen silt loam, light-subsoil phase.

The Bladen loam is developed in a few small areas in the northern part of both counties. Some of the largest areas are about 1 mile north of Moyock, northwest of Pierceville, and northwest of Hastings Corner. The type occupies flat or slightly depressed areas in which natural drainage ways have not been established. Artificial drainage is necessary to fit the land for farming.

The greater part of this type has been cleared and shows evidence of cultivation. At one time probably 50 per cent of it was in cultivation. A rather large area 1 mile north of Moyock and extending into Virginia, which has been abandoned and allowed to grow up to sedges, briers, and shrubs, could easily be reclaimed by opening up the filled-in ditches. Very little of the original tree growth remains, although there are indications that it once was heavily forested with pine, maple, sweet gum, tupelo, poplar, and some cypress. Uncultivated areas are used for grazing cattle and sheep.

Corn and soy beans are the principal crops. Oats, potatoes, and cotton are grown to a small extent with satisfactory yields. Corn returns 35 to 60 bushels per acre, averaging about 40 bushels, soy beans from 20 to 30 bushels, potatoes 60 to 150 bushels, and oats 30 to 60 bushels. This type is cropped in the same manner as the Bladen silt loam and the cultural methods and fertilization are the same. It is an acid soil and needs liberal applications of lime. Phosphoric acid and potash will also be beneficial.

The Bladen loam sells at \$25 to \$70 an acre, depending for the most part on drainage and location.

BLADEN SILT LOAM

The surface soil of the Bladen silt loam is a gray or dark-gray to grayish-brown silt loam 6 to 12 inches deep. The subsoil, beginning at about 12 to 15 inches, is a mottled light-gray, yellow, and brown, sticky, plastic clay. The subsurface or second horizon is usually a light-gray silty clay loam, but in places the heavy plastic subsoil lies immediately under the silt loam surface soil. In some places the second horizon is a brown silty clay loam. The surface color varies from dark grayish brown in wooded areas to gray in cultivated fields. Near the boundary between this type and the Elkton silt loam the surface is lighter in color, one type gradually blending into the other, and the subsoil is less plastic. In other places the surface is rather dark colored, resembling the Hyde loam.

Included with this type are small bodies of Hyde loam and Elkton silt loam, and many spots of Bladen silt loam, light-subsoil phase,

and of Bladen silty clay loam. The area lying south of Tull Bay is not uniform, the surface soil varying from light gray to dark gray and the texture from a very fine sandy loam to a clay loam, and the subsoil from a gray, yellow, and brown mottled clay with thin layers of gray fine sand to a mottled plastic clay, and in places to a steel-gray, heavy, plastic clay.

The Bladen silt loam is a fairly extensive type. It occurs in long, continuous areas extending from near Moyock south for several miles. Other large bodies are situated along the Lake Drummond Canal north of South Mills, south of Tull Bay, and 2 miles north of Hastings Corner.

The type occupies level, flat, or depressed areas, and the natural surface and internal drainage are poor.

The Bladen silt loam is an important type agriculturally, about 60 per cent of it being under cultivation. The locks in the Lake Drummond Canal hold the water in the canal at a higher level than the surrounding soils; consequently large areas of this valuable land have been abandoned for the lack of drainage. Most of the drainage in this section has to be accomplished by draining the water away from the canal, and this is expensive. Those areas too wet for cultivation are used for pasture, and in places some native grass is cut for hay. In dry seasons most all of this soil can be utilized for farm crops. The remaining forest growth consists of sweet gum, tupelo, pine, poplar, maple, and a little cypress.

Corn, soy beans, oats, potatoes, and some cotton are the chief crops, with corn and soy beans leading. Corn yields 25 to 60 bushels per acre, averaging about 35 bushels; soy beans 20 to 35 bushels, potatoes 60 to 125 bushels, and oats 35 to 50 bushels. Before the arrival of the boll weevil cotton yielded from three-fourths bale to 1½ bales per acre. As this soil is rather cold, cotton must be planted late, which increases the damage suffered from the boll weevil.

Two-horse turning plows and one-horse and two-horse cultivators are in general use. Very little fall plowing is done. Many of the best farmers use lime at the rate of 1 to 2 tons of ground limestone or 1,000 to 1,500 pounds of quicklime per acre. Corn planted after soy beans receives a little fertilizer, usually an 8-3-3 mixture; soy beans receive about 200 pounds of an 8-3-3 or 8-4-4 mixture per acre; while 600 to 1,000 pounds of a 7-5-5, 6-5-5, or 7-4-4 mixture is used on potatoes. Corn, cotton, and potatoes are always fertilized, while oats generally follow some fertilized crop, and soy beans are frequently planted in the corn without additional fertilization.

The forested land of the Bladen silt loam sells at \$30 to \$50 an acre and the improved land at \$50 to \$125 an acre.

This is naturally a strong soil. Better drainage and liberal applications of lime are its greatest needs.

Bladen silt loam, light-subsoil phase.—The light-subsoil phase of the Bladen silt loam consists of four horizons: A gray to dark brownish gray silt loam surface layer 7 to 10 inches thick; a drab-gray to ashy-gray, lifeless looking, brittle, heavy silt loam extending to 18 to 22 inches; a gray silty clay loam mottled with rusty brown extending to 30 to 36 inches; and a fourth layer or lower subsoil

of gray, mottled yellow and brown, extremely plastic clay. Locally the surface soil of this phase is somewhat lighter in color and resembles the Elkton silt loam. The essential features that differentiate this phase from the typical Bladen silt loam are the lighter texture and brittle structure of the upper subsoil, which breaks apart like corn-meal dough, and the greater depth to the plastic clay lower subsoil, which is encountered at depths of 30 to 40 inches.

The largest bodies of this phase lie immediately east of Belcross, west of Shawboro, and along the Lake Drummond Canal in the northeastern part of Camden County.

This phase occupies flat or slightly depressed areas, in the center of which the surface soil is darker and deeper and the second layer is brownish. The phase is probably a little better drained than the type, owing mostly to the greater depth to the plastic subsoil. It has no natural surface drainage.

The Bladen silt loam, light-subsoil phase, is an important soil but much less extensive than the typical soil. About 75 per cent of it is under cultivation. The original tree growth, crops grown, yields, fertilization, and methods of handling are the same as for the typical soil. The phase will respond to the same treatment for improvement as the typical Bladen silt loam.

The price of land of the phase ranges from \$50 to \$100 an acre, depending upon the state of improvement, drainage, and nearness to highways and transportation.

BLADEN SILTY CLAY LOAM

The Bladen silty clay loam consists of 3 to 5 inches of steel-gray or brownish-gray, heavy silt loam to silty clay loam with faint mottlings of brown. The subsoil is a dull steel gray, mottled rusty-brown or ochreous-yellow, heavy plastic clay. In places the surface soil dries out to medium light gray, as in the area east of Shawboro.

The largest bodies of this type are developed east of Shawboro and Perkins Chapel. Other fairly large areas are situated about 2 miles northwest of Moyock and northwest of South Mills, while a number of small patches are distributed throughout Camden County and the western part of Currituck County. The type generally occupies low, flat, depressed areas without natural drainage. Some of this soil remains in a semiswampy condition part of the year and all of it is poorly drained.

Only a few acres of this type are in cultivation. Some of this soil is said to have been cultivated before the Civil War and to have produced large yields of corn. The Bladen silty clay loam supports a forest growth chiefly of maple, beech, sweet gum, water oak, persimmon, a little cypress, and grapevines. Some areas have been cleared and utilized for grazing stock.

The Bladen silty clay loam in its present condition is not valued very highly, but by reopening the old canals and ditches it could probably be drained, and by making heavy applications of lime good yields of corn and soy beans could be obtained.

Bladen silty clay loam, swamp phase.—The swamp phase of the Bladen silty clay loam differs from the type in that it occupies a lower position and is covered with water the greater part of the year. The surface soil is a gray to dark-gray slightly mucky silty clay

loam. The subsoil is a mottled yellow, gray, and brown plastic clay on Mackay Island and on the west side of Great Marsh. Some of the phase is not covered with water and the surface soil is a gray silty clay loam, while in an area near the "Desert" the surface is quite mucky.

This phase occurs in a number of fairly large areas in the northern part of Currituck County. It includes a large part of Mackay Island and an area on the west side of Knott Island. Others lie north of Tull Bay, around the northern part of Great Swamp, about 2 miles southeast of Old Trap, and west of the "Desert," and small strips are mapped throughout the central part of the area.

The phase is low, some of the areas lying just above Tidal marsh and others bordering the interior swamps. The phase represents areas that probably were at one time Tidal marsh and were subsequently elevated to their present position, later becoming forested.

The swamp phase is a nonagricultural soil, all of it being forested with tupelo, sweet gum, red maple, and a few scattering pines. In the areas bordering the Great Marsh and on Mackay Island the tree growth consists mainly of pine, sweet gum, oak, tupelo, and maple. The Bladen silty clay loam, swamp phase, can be drained only at a very heavy expense and should be kept in forest.

NORFOLK LOAMY SAND

The surface soil of the Norfolk loamy sand is a gray to brownish-gray mellow loamy sand, 6 to 8 inches deep, underlain by a light-yellow loamy sand extending to depths of 12 to 24 inches. The subsoil is a yellow very friable sandy loam or light clayey sand. In some places it is a loamy sand throughout the 3-foot section, while in other places, usually at about 30 to 36 inches, the subsoil is a sandy clay of yellow or yellow mottled with reddish-brown color. A few spots of Norfolk sandy loam and Norfolk loamy fine sand are included with the loamy sand as mapped.

This type is of small extent in the area. The more important bodies are located east of Jarvisburg, north of Mamie, south of Riddle, south of Old Trap, and north of Indian Town. It occurs in relatively high interstream areas with a level to gently rolling topography. On account of its position and the open structure of both soil and subsoil, drainage is well established.

This is an important soil agriculturally, although it is only of small extent. About 90 per cent of it is under cultivation, and the rest supports a forest growth, principally of pine.

The Norfolk loamy sand is used for the production of the same crops as the Norfolk sandy loam and Norfolk loamy fine sand. This type of soil in other sections of North Carolina produces a high grade of bright-leaf tobacco, but at present very little tobacco is grown on the type in this area. The yields of different crops are practically the same as on the Norfolk sandy loam and loamy fine sand, and the kind and quantity of fertilizers used are the same as on the other Norfolk types. Land of this type sells at \$40 to \$75 an acre.

NORFOLK LOAMY FINE SAND

The surface soil of the Norfolk loamy fine sand consists of a light yellowish gray, mellow, loamy fine sand, 5 to 8 inches deep. The

subsoil is a light-yellow loamy fine sand, becoming slightly mottled with reddish brown at depths between 2 and 3 feet. Locally the material from 30 inches to below 3 feet is a yellow fine sandy loam or fine sandy clay.

Included with this type are small bodies of Norfolk fine sand, the largest of these occurring as low, narrow ridges on "Currituck Point." Another body of the Norfolk fine sand lies about one-half mile east of the junction of the Lake Drummond Canal with the Pasquotank River. Numerous small depressions of Portsmouth fine sandy loam also are included.

The Norfolk loamy fine sand is a comparatively extensive type and its greatest development is in the neck of Currituck County. Long narrow belts are situated south of Coinjock, in the vicinity of Poplar Branch, and north of Point Harbor. Other large bodies occur on Knott Island, north of Indian Town, south of Barco, east of Smiths Corner, north of Old Trap, northwest of Camden, on Church Island, and in the vicinity of Currituck, while other small patches are scattered over the southern and eastern parts of the area.

This type occupies the higher and better drained parts of the area. The topography is undulating to gently rolling, and both surface and internal drainage are good as a rule, although in some of the flatter places where the water table is high the land requires ditching.

This is an important agricultural soil. Probably 75 per cent of it is in cultivation, the rest being forested, chiefly with pine. Much of the wooded land shows evidence of former cultivation.

The Norfolk loamy fine sand is used chiefly for the production of sweet potatoes as a cash crop and corn as a subsistence crop. Melons, vegetables, early truck crops, and cotton are of minor importance. Sweet potatoes, the principal crop, yield from 100 to 150 bushels per acre when dug for early market and 150 to 250 bushels if allowed more time to mature. As much as 300 or more bushels are obtained at times, when dug late in the season. Corn yields from 15 to 30 bushels and cotton from one-fourth to one-half bale per acre.

All crops are heavily fertilized. Sweet potatoes generally receive from 800 to 1,200 pounds, and occasionally as much as 1 ton per acre of high-grade fertilizer. Corn and cotton, planted after sweet potatoes, receive little or no fertilizer. Some farmers use home-mixed fertilizer consisting of cottonseed meal, acid phosphate, and kainit. Compost is prepared in the winter by hauling in pine straw and leaf mold, mixing with stable manure, adding acid phosphate, and allowing to rot. This is put in the furrows where the crop is to be planted. For sweet potatoes a furrow is opened up, the compost put in and covered by running a 1-horse turning plow on each side, forming a small ridge on which the slips or sprouts are set.

Land of this type sells at \$20 to \$100 an acre, depending upon improvements, nearness to transportation, and value of the forest growth.

The Norfolk loamy fine sand is decidedly deficient in organic matter, and this should be supplied by growing and turning under rye or cowpeas, or some other leguminous crop. The pine forest growth should be protected from fire. This is one of the earliest truck soils in the Atlantic Coastal Plain region.

NORFOLK SANDY LOAM

The surface soil of the Norfolk sandy loam is a gray to yellowish-gray loamy sand 5 to 7 inches deep. The subsurface or second horizon is a pale-yellow, slightly sticky when wet, light sandy loam. The subsoil, beginning at 10 to 15 inches, is a yellow, friable sandy clay loam to sandy clay which extends to a depth of more than 3 feet.

The surface soil is darker and the subsoil somewhat mottled where the type grades into the Portsmouth and Bladen soils. Where it is associated with the Ruston, the lower subsoil is usually mottled with reddish brown. The surface soil in places is deep and the subsoil is a reddish yellow or yellowish red, this condition being particularly noticeable in areas on Knott Island. These areas would have been mapped as Ruston sandy loam, deep phase, if they had been large enough to separate on a map of the scale used. Included with this type are small bodies of Norfolk fine sandy loam, Norfolk loamy sand, Portsmouth sandy loam, and Ruston sandy loam.

The Norfolk sandy loam occurs in rather small bodies on Knott Island, Bells Island, around Sandy Point, in the vicinity of Riddle, north of Cow Creek, and west of Moyock.

The topography is level to gently rolling and, owing to the open nature of the surface soil and the friable sandy clay subsoil, drainage is well established.

The Norfolk sandy loam occupies a comparatively small total acreage in this area, but it is an important agricultural soil. Probably 90 per cent of it is under cultivation, and the rest is forested chiefly with pine.

Cotton, sweet potatoes, and corn are the chief crops. Potatoes, English peas, watermelons, and vegetables are minor crops. Soy beans, cowpeas, and rye are grown mostly for feed and to a less extent for soil improvement. Cotton yields from one-half bale to 1¼ bales per acre, averaging about two-thirds bale. Sweet potatoes yield from 100 to 150 bushels per acre, averaging about 135 bushels. Corn yields from 15 to 40 bushels, with an average of about 25 bushels per acre.

Fertilizers are used for all crops. Cotton receives from 400 to 800 pounds of 8-3-3 or 8-4-4 mixture, and sweet potatoes from 500 to 1,000 pounds of some high-grade fertilizer. The Big Stem Jersey is the sweet potato variety usually grown for the northern markets, while Triumph and Nancy Hall are grown for home use and the local market and are becoming more popular for northern shipments. The latter varieties are much sweeter than the Big Stem Jersey, but the Jersey variety will probably give larger yields per acre than the sweeter kinds.

Land of this type sells for \$30 to \$100 an acre, depending upon its location and improvements.

The Norfolk sandy loam is deficient in organic matter, and this can probably be best supplied by growing more legumes, such as cowpeas, crimson clover, rye, and vetch, and turning these under. A systematic crop rotation including legumes would prove beneficial.

NORFOLK FINE SANDY LOAM

The surface soil of the Norfolk fine sandy loam is a gray to yellowish-gray, mellow, loamy fine sand to fine sandy loam, underlain

at 4 to 6 inches by a pale-yellow fine sandy loam to loamy fine sand extending to 10 to 14 inches in depth. The subsoil is a yellow, friable fine sandy clay, which extends to a depth of 3 feet or more. In forested areas the first inch or two of the surface soil is brownish gray to dark gray in color. The lower part of the 3-foot section in the flat areas and where the type is associated with the Elkton or Bladen soils is somewhat heavier and mottled. Included with this type are some bodies of Norfolk loamy fine sand and Moyock fine sandy loam too small to warrant separation.

The Norfolk fine sandy loam is typically developed in several small areas and strips in the southern part of Currituck County in the vicinity of Jarvisburg, northeast of Riddle, northeast of Indian Town, west of Barco, on Knott Island, and in a few other places.

The type is agriculturally important, but occupies a very small total acreage in this area. Approximately 80 per cent of it is in cultivation, the rest being forested with pine, dogwood, hickory, and oak.

This type is used for the production of sweet potatoes, cotton, and potatoes as cash crops, and corn, soy beans, and vegetables as subsistence crops. Some truck crops also are grown. The yields are slightly higher than on the Norfolk loamy fine sand, especially of cotton and corn. The potato yield is about the same. The kind of fertilizer and amounts used per acre are the same as on the Norfolk loamy fine sand. The soil is handled in the same way and responds to the same methods of improvement as the Norfolk loamy fine sand. The Norfolk fine sandy loam sells at \$50 to \$100 an acre.

RUSTON FINE SANDY LOAM

The surface soil of the Ruston fine sandy loam, to a depth of 5 to 8 inches, is a gray to brown, mellow fine sandy loam, underlain by a layer of reddish-yellow to reddish-brown, friable fine sandy loam extending to depths of 10 to 15 inches. The subsoil is a yellowish-red, reddish-yellow to reddish-brown, friable fine sandy clay to a depth of 3 feet or more.

Included with this type are small spots of Ruston loamy fine sand, Ruston fine sandy loam, deep phase, and a few very small areas that have a brown surface soil and a red subsoil. These latter areas would have been mapped as Orangeburg fine sandy loam if they had been large enough to show on the map. Along the swamp near Indian Town the surface soil is gray fine sand to loamy fine sand and the subsoil is light reddish yellow friable fine sandy loam. On Knott Island there were a few spots of Ruston sandy loam.

The Ruston fine sandy loam is typically developed in a few small bodies in the vicinity of Currituck, southwest of Maple, and east of Indian Town. It occupies a higher and better drained position than the surrounding soils, either as interstream areas or bordering swamps on the sound. Drainage is good.

This type is of small extent, but is an important agricultural soil. About 85 per cent of it is under cultivation; the uncleared areas support a forest consisting chiefly of white, red, black, and post oaks, dogwood, hickory, and persimmon, with a few scattering pines. Cotton, corn, and sweet potatoes are the main crops. Cotton and

sweet potatoes are cash crops, and corn a subsistence crop. Cowpeas, soy beans, potatoes, and vegetables are minor crops.

The type is well adapted to cotton, yielding from three-fourths bale to 1½ bales per acre, averaging about 1 bale. Corn yields 20 to 35 bushels per acre, and sweet potatoes 125 to 300 bushels, averaging about 150 bushels. Cotton and corn are usually fertilized with a complete mixture, analyzing 8-3-3 or 8-4-4, in acreage applications of 200 pounds for corn and 400 to 800 pounds for cotton. Sweet potatoes receive from 800 to 1,200 pounds of a 7-5-5 mixture per acre.

This soil is cultivated in small ridges. It is comparatively easy to handle and heavy work stock is not necessary. Land of this type of soil is held at \$50 to \$100 an acre, depending on its location.

KEYPORT VERY FINE SANDY LOAM

The surface soil of the Keyport very fine sandy loam consists of light-gray, brownish-gray, or yellowish-gray very fine sandy loam 6 to 8 inches deep. The upper subsoil is a yellow, brownish, or buff, heavy but brittle silt loam to silty clay loam, extending to a depth of 22 to 30 inches. Below this there appears a silty clay mottled brown, yellow, and gray, with some faint rusty streaks.

This type is closely associated with the Elkton very fine sandy loam and silt loam, and the boundaries between areas of these soils are more or less arbitrary. In the vicinity of Indian Town the surface is gray and the upper subsoil is yellow, passing at about 10 to 12 inches into a mottled yellow, gray, and reddish-brown, heavy plastic clay. These areas would have been mapped as Dunbar very fine sandy loam if they had been larger. In other places the surface is light brown and the subsoil a yellowish-red or yellow and reddish-brown mottled, heavy but friable very fine sandy clay to fine sandy loam.

This type occurs in narrow bands along some of the creeks and swamps in both counties. The largest bodies are west and south of Belcross, bordering the stream swamps in the vicinity of Camden, along the streams in the north-central part of Currituck County, and about 2 miles south of Shiloh. Other bodies occur scattered along the east side of Pasquotank River from a short distance above Burnt Mills to about 4 miles below Shiloh.

The type occupies flat to gently sloping areas ranging from 5 to 12 feet above sea level. Practically all of it has fairly good surface drainage; in the flat places, however, ditches are necessary.

The Keyport very fine sandy loam is of small extent, but is one of the important soils of the area. About 75 per cent of it is under cultivation. The rest is in mixed forest, chiefly hardwoods. Among the more plentiful trees may be mentioned post oak, black, red, white, and Spanish oaks, hickory, hornbeam, dogwood, pine, maple, elm, tupelo, sweet gum, persimmon, beech, and holly.

Potatoes, corn, cotton, and soy beans are the principal crops. English peas, alfalfa, crimson clover, and pecans are minor crops. Potatoes yield 75 to 200 bushels per acre, averaging about 125 bushels, corn 20 to 30 bushels, cotton one-fourth bale to 1¼ bales, soy beans 15 to 25 bushels, and English peas 75 to 125 baskets per acre.

The same methods of handling and fertilization are practiced on this type as on the Elkton very fine sandy loam, with which it is very closely associated. Most of the type is in a fairly high state of productiveness. The soil needs lime to grow clover. Liming, growing a legume in the crop rotation, and the incorporation of organic matter will improve the yields.

PORTSMOUTH SANDY LOAM

The surface soil of the Portsmouth sandy loam is a dark-gray to nearly black or dark-brown sandy loam 8 to 12 inches deep, and in many places extremely high in organic matter. The subsoil is a mottled gray and yellow, friable sandy clay, which is underlain at an average depth of 34 inches by a gray watery sand or loamy sand. In places the surface is dark gray when moist and dries out to a gray. The surface is always lighter in color near the boundaries of the Norfolk and Elkton soils. In some of the wooded areas the surface is more or less loamy to a depth of 2 or 3 inches. Small spots of Portsmouth loam, Portsmouth fine sandy loam, and Norfolk sandy loam were included with this type.

The Portsmouth sandy loam is one of the least extensive types in the area. The largest bodies lie about 1 mile northeast of Smiths Corner, in the vicinity of Riddle, about 1½ miles southwest of Snowden, and one-half mile north of Old Trap. Other areas occur in the southern part of Currituck County.

The type occupies flats or depressions, usually associated with the Norfolk soils. Natural drainage is poor.

The Portsmouth sandy loam is not important agriculturally on account of its small extent. About 50 per cent of it is in cultivation, and the rest supports a forest, chiefly of pine, sweet gum, oak, holly, maple, myrtle, and gall berry. The principal crops are potatoes, corn, and soy beans. Cabbage, onions, and other vegetables are grown for home use. Potatoes yield from 50 to 100 bushels per acre, corn 10 to 30 bushels, and soy beans 12 to 20 bushels.

This type is handled in the same way as the Portsmouth fine sandy loam and responds to the same fertilizer treatment and the same methods of improvement. Fertilizers with less nitrogen are more generally used on the Portsmouth soils than on the lighter colored soils of the area.

This land is valued at \$20 to \$50 an acre, depending chiefly on drainage, and location in respect to transportation and good roads.

PORTSMOUTH FINE SANDY LOAM

The surface soil of the Portsmouth fine sandy loam consists of a dark-gray to nearly black loamy fine sand to fine sandy loam 7 to 10 inches deep. The subsoil is a yellowish-gray or light-gray, mottled with yellow or brownish-yellow, friable fine sandy clay, underlain at 28 to 34 inches by a light-gray, loamy fine sand, drying out to a nearly white, mealy or loamy fine sand. Bordering the peaty and marshy areas, the surface is mucky for 2 or 3 inches and contains considerable organic matter. In the low swales surrounded by Norfolk fine sandy loam the surface is gray to dark gray. Included with this type are small bodies of Portsmouth sandy loam, Ports-

mouth loam, and Peat, shallow phase. In places the surface soil is a dark-gray loamy fine sand and the subsoil is a gray loamy fine sand to a depth of 3 feet or more.

The Portsmouth fine sandy loam is a fairly extensive type, occurring in narrow strips and irregular bodies along the so-called ridge from Shawboro to Old Trap, from Currituck to the southern end of Currituck Neck, along the Maple and Great Swamps, on Church Island, and in small areas on Knott Island.

This type occupies level to depressed, naturally poorly drained situations. The better drained land lying farther back from the swamps and marshes is well suited for the production of potatoes, corn, and soy beans. About 30 per cent of it is in cultivation, and the remainder is forested mainly with pine, maple, holly, sweet gum, oak, and bay trees, with an undergrowth of myrtle, gall berry, and briers.

The chief crops are potatoes, corn, and soy beans. Some cotton is also grown. Cabbage, onions, and strawberries do well. Potatoes yield 60 to 150 bushels per acre, corn 20 to 40 bushels, and soy beans 15 to 25 bushels. A high-grade fertilizer analyzing 7-5-5 or 6-5-4 is applied at the rate of 800 to 1,000 pounds for potatoes, and small quantities for corn and soy beans.

Land of this type is valued at \$20 to \$80 an acre in the better drained situations; the value of the poorly drained wooded areas is dependent on the stand and character of the forest growth.

PORTSMOUTH LOAM

The surface soil of the Portsmouth loam is a dark-brown to black loam 10 to 18 inches deep. The subsoil varies from a mottled yellow and gray loamy sand or friable sandy clay to a mottled gray, drab, and yellow, rather heavy, sticky sandy clay. The surface soil contains a high percentage of organic matter and in many places is slightly mucky or even peaty at the surface, especially on some of the areas adjoining the peaty soils.

The largest bodies of this type are found about 1 mile north of Horseshoe, bordering the south side of the Dismal Swamp in the northwestern part of Camden County. Other good-sized areas occur just west of Baxter Grove Church, about 1 mile southwest of Currituck, south of Maple, and south of Indian Town.

The Portsmouth loam has a flat surface and is poorly drained, a large part of it being in a semiswampy condition. Where it has not been ditched the water stands on the surface a good part of the year. It occupies high, level areas, in which natural streams have not been developed, and depressed areas surrounded by better drained soils. Some of the areas occur as water-soaked flats at the heads of small streams. Two of the largest areas occupying such positions are found west of Baxter Grove Church and south of Maple.

This type is of rather small extent and in its present condition is unimportant agriculturally. None of it is in cultivation, probably owing to the high cost of drainage. The principal tree growth consists of gum, maple, water oak, bay, and in the wetter areas some cypress. There is an undergrowth chiefly of gall berry and briers.

Much of this type could be drained and made to produce satisfactory yields of corn, potatoes, and oats. In counties where this

type of soil is drained and farmed, corn and oats are the chief crops. The land after drainage is heavily limed and as much as 50 to 60 bushels of corn have been produced without the use of other fertilizer. Lime should be applied every three or four years.

HYDE LOAM

The surface soil of the Hyde loam is a black or dark-brown loam to slightly mucky loam high in organic matter, and 18 to 36 inches deep, with an average depth of about 20 inches. The subsoil is a gray, drab, or steel-gray, mottled brown, sandy clay to clay. Small bodies of Peaty muck and Peat were included with this type. These inclusions have a dark-brown soil that extends to a depth of 3 feet or more. The type also includes small spots of Bladen loam.

The largest areas of Hyde loam lie about 3 miles southwest of Moyock and 1 mile east of Tar Corner. The type occupies an intermediate position between the Peaty muck and the Bladen soils. Natural drainage is lacking, but the greater part of the land of this type is included in the Moyock drainage district, traversed by canals at intervals of one-half to 1 mile and by a number of lateral ditches.

About 30 per cent of this type is now in cultivation. On most of the rest the merchantable timber has been cut, the ditches and canals have partly filled, and the vegetation consists of a thick growth of underbrush of briars, sedges, and reeds. The original tree growth consisted chiefly of tupelo, maple, poplar, and cypress.

Corn and soy beans are the principal crops. Potatoes, oats, and vegetables are grown for home use. Corn yields range from 30 to 60 bushels per acre, averaging about 40 bushels, and soy beans yield 15 to 30 bushels. Very little fertilizer is used, but lime is applied at the rate of 1,000 to 2,000 pounds per acre.

In clearing this land the forest growth is cut in late summer and the land allowed to dry. In the spring, usually sometime in May, it is burned over and corn is planted between the logs and stumps, the salable timber having been previously removed. The corn crop is not cultivated the first year or two. At harvest time the crop must be carried out by hand, as the stumps are so numerous that wagons can not be used and the soil is spongy and soft. When first farmed it is difficult to use horses for cultivation, even after the land is clear of stumps, but after a few years of cropping it becomes settled and easier to work.

The price of the Hyde loam ranges from \$20 to \$150 an acre, depending mostly on its location with respect to main drainage canals and whether cleared or uncleared.

PEAT

Peat consists of brown, more or less fibrous, partly decomposed organic matter, varying in depth from 3 to 12 feet, underlain by a friable sandy clay, sand, or blue smooth clay, and in places by beds of shells. The blue clay and shells appear at 8 to 12 feet below the surface. In dry seasons fires occur in the Peat of the Dismal Swamp which burn until water comes over the surface. No signs of fire were seen in Run Swamp, Great Swamp, or in other Peat areas

where the water level has been high enough to keep it wet at all times.

Peat occupies about one-fifth of the entire area. It covers practically all of the Dismal Swamp or the "Desert" and the Great Swamp. It occurs also on the west side of North River and in other places.

The surface of the type is flat. The Dismal Swamp area occupies probably the highest elevation in the two counties, about 20 feet above sea level. The areas along the rivers are almost at sea level. There are no natural drainage ways in the Peat areas, and water stands on the surface the greater part of the year.

Peat in this area is not used for agriculture except in spots for grazing purposes. In places there is a thick growth of reeds and wild grasses, which afford pasturage during the entire year. The Dismal Swamp, as seen from the State highway along the Lake Drummond Canal just south of the Virginia State line, presents the most desolate appearance of any section of North Carolina, being covered with a forest growth of small red maple, scattering scrub pine, gum, cedar, and cypress, and a dense growth of coarse grasses, briars, vines, and other water-loving plants. There are, however, large areas which have a thick forest growth consisting chiefly of tupelo, gum, poplar, juniper, red maple, water oak, bay, balm of Gilead, some cypress, and an occasional cluster of pine.

Peat is valued on the basis of the stand and quality of the forest growth, and its accessibility to transportation.

Peat, shallow phase.—The shallow phase of Peat differs from the typical Peat in the depth of the surface layer. The surface soil is brown, fibrous, partly decomposed vegetable matter to a depth of 20 to 30 inches. The subsoil is a sand, sandy clay, or clay, gray or mottled gray, yellow, and rusty brown in color.

Peat, shallow phase, is confined almost exclusively to a large area in Camden Point, and another large body in Currituck County lying on both sides of the ridge south of Coinjock. A canal which is a section of the Inland Waterway crosses the latter area, connecting the North River and Coinjock Bay. This phase is nonagricultural in its present condition, except for some grazing. The forest growth is the same as on the typical Peat.

PEATY MUCK

The surface soil of Peaty muck consists of brown to dark-brown, finely divided, fairly well decayed vegetable matter mixed with small quantities of mineral matter, which extends to a depth of 3 feet or more. In most cases this appears to be nothing more than fine Peat. When drained and dry it will burn, as in the case of a large area in the Moyock drainage district, where the surface of hundreds of acres has burned to a depth of 6 to 18 inches, leaving old stumps and roots exposed.

This type occupies a long narrow strip adjoining the Peat areas and almost encircling the "Desert." As mapped this type includes patches of Hyde loam and Peat. Some of it is included in the Moyock drainage district, about 3 miles southwest of Moyock along

the Guinea Mill Run Canal; another large body lies along the Pasquotank River west of South Mills. It has a flat topography, and is naturally poorly drained. Without canalling and ditching water stands on the surface the greater part of the year.

At present very little of this type is being cultivated. Only narrow strips along the outer edge, bordering the Hyde loam and Bladen soils, are in cultivation. Practically all the original tree growth has been removed. As evidenced by the number of large stumps, it was at one time heavily forested with poplar, tupelo, cypress, maple, and some juniper. The vegetation on most of the area at present consists of a dense growth of reeds, briers, wild grasses, and shrubs.

The area lying about 3 miles southwest of Moyock, included in the Moyock drainage district, was partly drained, but the canals have been allowed to fill somewhat and the water table is anywhere from 6 inches to 2 feet below the surface.

Drainage is absolutely necessary before the Peaty muck can be farmed, and when drained it is hard to handle for a few years. After it has been farmed a year or two good yields of corn are produced.

SWAMP

Swamp, as mapped in the Camden-Currituck area, includes strips of land along the natural drainage ways that could not be classified as a soil type. It is subject to frequent overflow or is covered with water the greater part of the year. The surface material usually consists of Peat, Peaty muck, dark-gray sandy loam, loam, or silt loam, and varies in depth from 1 or 2 inches to 2 feet or more. It is underlain by a mottled yellow and gray, or yellowish sandy loam or sandy clay, or a drab clay with brownish or rusty iron streaks. The deep clay with rusty iron streaks is usually found along the small drainage ways. The surface material along the small streams is generally more uniform and is a dark-gray to gray silt loam or silty clay loam. The grayish fine sand and sandy clay constitutes the usual subsoil in the peaty swamps near the larger streams, as along the Pasquotank River. These areas are at about sea level and water covers the surface from 6 inches to 5 feet deep throughout the year. In these low situations the surface is peaty or mucky and is composed of vegetable matter in all stages of decomposition, ranging in depth from 1 foot to 3 feet or more. Adjacent to the upland the surface soil is mixed with sand and fine sand.

The largest areas of Swamp lie along the Pasquotank River, while a number of narrow strips occur along many of the creeks. In places Swamp is used to a small extent for pasture. In many places it supports a heavy forest growth consisting chiefly of tupelo, cypress, maple, and a few scattering pines, and the rest supports a dense growth of underbrush of all kinds of water-loving plants and shrubs.

This land is valued chiefly for its timber. However, there are a few small strips that could be reclaimed by drainage and by heavy liming and proper handling could be made to produce good yields of corn, soy beans, oats, hay, and forage crops.

TIDAL MARSH

Tidal marsh comprises marshy grassy areas lying between the upland soils and tidal streams and occurring on islands in Currituck Sound. The soil is a drab-gray to dark-gray silty to clayey material, containing varying quantities of vegetable matter in all stages of decomposition. The subsoil, as seen in fresh canal banks, is a drab or bluish plastic clay.

There are large areas of Tidal marsh in the eastern part of Currituck County, many of them in Currituck Sound. The largest body, known as the Great Marsh, occurs in the northeastern part, bordering the Virginia State line; smaller areas lie along North River and Tull Creek. All the marsh land in this area is fresh-water marsh, or at most only slightly brackish, as in the southern part of Currituck Sound.

Land of this description has little or no value, except for grazing. Quite a number of cattle and hogs are pastured on these marshes, which are burned over in early spring to allow fresh grass to come up for pasture.

COASTAL BEACH

Coastal beach represents areas of gray to yellowish-gray, incoherent, siliceous sand mixed with small quantities of broken shells. In low, flat places between the sand dunes and along the marshes on Currituck Sound the surface is gray to dark gray, owing to the accumulation of some organic matter. Coastal beach is confined to a strip along the Atlantic Ocean, ranging in width from about one-fourth mile to $1\frac{1}{4}$ miles and extending in an unbroken belt from the Virginia line to the southern part of Currituck County. Along the water's edge next to the ocean the surface is smooth and gently sloping toward the water. The greater part of the Coastal beach consists of a series of sand hills or dunes, or of sand ridges more or less broken, running parallel with the coast. Some of the dunes reach an elevation of 50 feet or more.

Coastal beach has no value for agriculture. It affords some grazing in a few places. The main part of the type is barren sand. The vegetation on a strip farthest from the ocean and away from the salt-water spray or along the marsh consists of scrub oak, myrtle, yaupon (cassena), and wild grasses.

Along the Currituck Sound side of the Coastal beach areas there are low, marshy places, with smooth surface, and in such locations considerable organic matter is mixed with the sand. It is these areas, which support a growth of wild grasses and small bushes, that are used as pasture. The largest body of this grazing land is found west of the Wash Woods Life Saving Station.

SUMMARY

The Camden and Currituck Counties area is situated in the extreme northeastern part of North Carolina, bordering the Virginia line. It contains 512 square miles, or 327,680 acres, of which Camden County forms 220 square miles and Currituck County 292 square miles.

The area is composed of but one main physiographic division. All parts of the area, except a few sand hills on the barrier between the sound and the ocean, lie below 20 feet in elevation, the average elevation being about 8 feet above sea level. As viewed by the eye the area is a low flat plain, slightly dissected but with no perceptible general slope. The drainage is into the Pasquotank, North, and Northwest Rivers and Currituck Sound. About 85 per cent of the Camden-Currituck area is poorly drained. Approximately 100 square miles of the Dismal Swamp and all of Great Swamp are included with this area.

The population in Camden County, which has been on the decrease during the last 40 years, is native born. Currituck County has made a slight increase in the same time. About one-third of the population in the two counties are negroes.

Agriculture is the leading industry, but lumbering, fishing, duck hunting, and oystering are important adjuncts to agriculture. The transportation facilities are good. The roads for the most part are unimproved, but there are three State roads under construction.

The climate is mild, and the rainfall is well distributed throughout the year, being heaviest in the growing season. Crop failures are unknown. Corn, soy beans, cotton, sweet potatoes, potatoes, and truck are the chief agricultural products.

Camden and Currituck Counties are said to be nearly self-sustaining in regard to food and feeds. All the feed needed could be cheaply produced on the farms of the area.

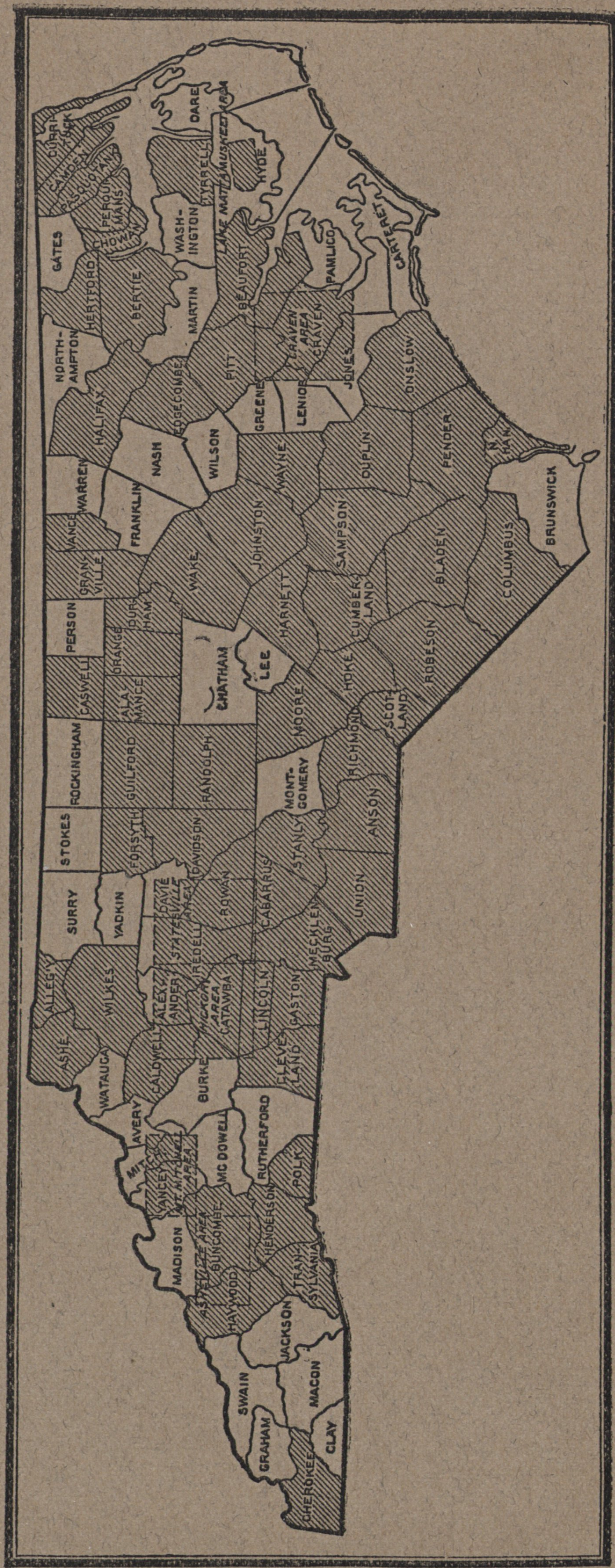
The principal products shipped out of the area are sweet potatoes, potatoes, English peas, and other vegetables, in addition to fish, eggs, poultry, and some livestock. Good markets are accessible for all the surplus crops produced.

Eight soil series are represented in the area by 19 soil types and 3 phases. In addition miscellaneous classifications, as Peat, with a shallow phase, Peaty muck, Swamp, Tidal marsh, and Coastal beach, were recognized in this area.

The Elkton, Moyock, Bladen, Hyde, and Portsmouth soils are best suited to the production of soy beans, corn, potatoes, and grasses; the Ruston, Keyport, and Norfolk soils are adapted to growing sweet potatoes, potatoes, corn, cotton, soy beans, and truck crops. Peat, Peaty muck, and Swamp in their present condition are not farmed, but are used for pasture and forestry. Coastal beach consists of nonagricultural sand. Nearly 33 per cent of the entire area is mapped as Peat and Peaty muck and is locally called "Swamp."

The soils of the area need better drainage, deeper plowing, systematic crop rotation, and the incorporation of organic matter. All the soils are acid, and liming is necessary for the best results.

More than 57 per cent of the farms in Camden County and over 35 per cent of those in Currituck County are operated by tenants. The price of land ranges from \$10 to \$150 an acre.



Areas surveyed in North Carolina, shown by shading