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Soil Survey
of
Pamlico County, North Carolina

By
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and
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Bureau of Chemistry and Soils
In cooperation with the North Carolina Department of Agriculture
and the North Carolina Agricultural Experiment Station

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SOIL SURVEY OF PAMLICO COUNTY, NORTH CAROLINA

By JOHN T. MILLER, in Charge, and ARTHUR E. TAYLOR

COUNTY SURVEYED

Pamlico is one of the easternmost counties of North Carolina (fig. 1). The northern boundary, separating it from Beaufort County, is an arbitrary line which runs for the most part through pocosins. On the west, Upper Broad Creek forms the boundary between Pamlico and Craven Counties. On the south, east, and northeast, the limits of the county are determined by Neuse River, Pamlico River, Pamlico Sound, and numerous small estuaries extending inland from the coast line. The largest of these estuaries forms the lower channel of Bay River and is navigable to small boats as far inland as Bayboro which is located approximately 12 miles from Pamlico Sound. This town is the county seat. It is 150 miles southeast of Raleigh by rail and 186 miles south of Norfolk, Va. The total area of the county is 343 square miles, or 219,520 acres.

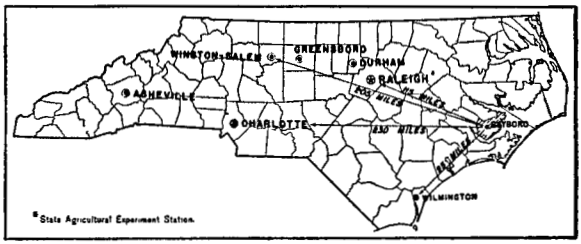

FIGURE 1.—Sketch map showing location of Pamlico County, N. C.

The county is situated on the Chowan and Pamlico marine terraces. These are separated by a low-lying sand ridge which extends northward along the Sandhill road from Minnesott Beach. The general surface configuration is that of a low almost level plain that grades to the east and northeast to Pamlico Sound. South from Bayboro and in the northern and northwestern parts of the county are large areas locally known as pocosins. These are almost level interstream areas, in which there is an imperceptible slope from the centers outward. The most noticeable surface features are along Neuse River in the vicinity of Minnesott Beach, where bluffs rising to a height ranging from 10 to 15 feet are along the banks. The small tributaries of this river are well entrenched and bordered by short slopes. Over much of the rest of the county drainage is poor, and over large areas there are no established stream courses. Water flows over such areas in sheets.

Elevations above sea level are low—so low that large areas in the eastern and northeastern parts of the county remain permanently swampy because of inundation by high tides. During storms, such

as the one occurring in eastern North Carolina in the fall of 1933, extensive areas are covered by ocean water for short periods. The highest elevations are west of the Sandhill road where the higher interstream elevations range from 25 to 50 feet. In approximately one-third of the county the elevation is less than 9 feet, and a considerable part of the shore line along Pamlico Sound is less than 1 foot above tide level.

Only a small proportion of the land is well drained, and for the most part the small well-drained areas border streams. Practically all of the cultivated land is artificially drained by small, open ditches spaced from 90 to 210 feet apart, depending on the character of the soil. These flow into larger ditches, or canals, or into natural outlets. Most of the larger ditches are community drainage projects and in most places serve as property lines.

According to the 1935 census, 34,290 acres, or 15.3 percent of the total area of Pamlico County, were available for crops. The remainder is largely cut-over timberland, with smaller amounts of open land in pocosins and salt-water marshes.

On the better drained soils, loblolly, pond, and longleaf pines are the dominant trees. On numerous small areas, however, there is a mixed timber growth consisting of both coniferous and deciduous trees. In these forests oak and soft maple are dominant deciduous trees. The more swampy areas support a forest growth mainly of black gum, sweetgum, and soft maple, together with a profuse growth of such other trees as oak, bay, ash, and tuliptree, and a few pines. In the permanently swampy areas, this growth is largely replaced by gum and cypress. In places where the sunlight penetrates between the trees there is a dense undergrowth of gallberry, myrtle, bay, holly, and various briers, and in the densely shaded areas there is a profuse growth of ferns and other simple forms of plant life. On the borders of the pocosin areas is an almost impenetrable growth of small shrubs, myrtle, gallberry, bay, moss, briers, and in some places reeds, whereas the centers support a growth of reeds and are locally called open land. Much of the lowland bordering Pamlico Sound and many of the estuaries are covered by a salt-water marsh vegetation consisting largely of sedges and coarse grasses, supplemented by pine on the slightly elevated areas. The original timber growth contained more longleaf pine than does the present forest.

Pamlico County was organized from a part of Craven County in 1872, and in 1874 and 1875 parts of Beaufort County were annexed. Settlement along Neuse River in Pamlico County is closely connected with the settlement of Craven County. The first colony was established along the Neuse and Trent Rivers in 1707 by a colony of Huguenots. In 1710 the first permanent colony was established at New Bern by Swiss and Germans. Later settlers of Scotch and English origin came from other sections of this and other States. The northeastern part of the county was not settled until about 1865. The white population consists of descendants of the early settlers and of people who have recently moved in from other sections.

In 1930, the total population numbered 9,299, all classed as rural, and the density was 26.6 persons a square mile. Native-born whites represent 66 percent of the total, foreign-born whites 0.1 percent, and Negroes 33.9 percent. The population in 1930 was slightly less than in 1910 but greater than in 1920. It is sparsely but evenly distributed throughout the county, exclusive of the unsettled pocosins. This county could support a much larger rural population, as there are still large areas of high-grade agricultural land not under cultivation.

Oriental, with a population of 601, is the largest town. Stonewall, Bayboro, Arapahoe, Vandemere, Hobucken, Mesic, Grantsboro, and Alliance are small towns which serve as trading and community centers.

The central part of the county is served by a branch of the Norfolk Southern Railroad and the northeastern part by the Atlantic Coast Line Railroad. Truck service also is well established to the large eastern markets. Freight-boat service is afforded by the inland waterway. The main highways are hard surfaced, and other roads are graded and kept in good condition.

The county is well supplied with telephones, consolidated schools, and churches. There are no large factories. Most of the small industrial enterprises are maintained to supply some particular need of the local farmers or fishermen. A large proportion of the rural-nonfarm population is engaged in fishing or oystering, in many instances on a part-time basis, combined with subsistence farming. Potato barrels are manufactured in small factories, and this enterprise employs many persons on part time. Guiding and other services, connected with hunting and fishing parties, also furnish part-time employment for a number of the inhabitants.

CLIMATE

As Pamlico County is near the Atlantic Ocean, the climate is influenced by the tempering effects of the water. The weather is mild throughout the year, and there are no wide variations between the winter and summer temperatures. The winters are sufficiently mild for the growth of cover crops and hardy vegetables, and outdoor work can be carried on throughout the winter. Occasionally the ground is frozen during the winter or early spring, but only to a slight depth and for short periods. The infrequent snowfalls are light and generally remain on the ground only a few hours. Truck crops—such as cabbage, English peas, potatoes, beets, and string beans—are successfully grown for late spring or early summer shipment.

The average date of the latest killing frost is March 30 and of the earliest November 9, but frost has been recorded as late as April 25 and as early as October 10. The average frost-free season is 224 days, or almost 7½ months. The rainfall is well distributed throughout the year. It is heaviest during the summer.

The Weather Bureau maintains no station in Pamlico County, but table 1, which gives the normal monthly, seasonal, and annual temperature and precipitation, was compiled from the records of the station at New Bern in Craven County, 16 miles west of Bayboro

and at approximately the same elevation. The data obtained from this station may be considered representative of climatic conditions in Pamlico County.

TABLE 1.—*Normal monthly, seasonal, and annual temperature and precipitation at New Bern, Craven County, N. C.*

[Elevation, 12 feet]

Month	Temperature			Precipitation			
	Mean	Absolute maximum	Absolute minimum	Mean	Total amount for the driest year (1897)	Total amount for the wettest year (1908)	Snow, average depth
	° F.	*° F.*	*° F.*	*Inches*	*Inches*	*Inches*	*Inches*
December	47.0	81	5	3.86	4.79	3.64	0.9
January	46.1	83	4	4.02	1.74	5.60	1.1
February	47.1	81	2	4.09	4.12	5.20	1.7
Winter	46.7	83	2	11.97	10.65	14.44	3.7
March	53.9	92	17	4.10	3.85	6.73	.2
April	60.7	94	27	3.56	1.91	3.61	(1)
May	69.5	99	30	4.28	2.68	11.53	.0
Spring	61.4	99	17	11.94	8.44	21.87	.2
June	76.3	103	48	5.91	2.98	9.95	.0
July	79.4	101	54	7.51	2.55	17.60	.0
August	78.5	100	53	7.02	3.68	11.77	.0
Summer	78.1	103	48	20.44	9.21	39.32	.0
September	74.2	100	41	5.21	.74	2.76	.0
October	63.7	98	26	3.54	4.89	9.38	.0
November	54.3	86	16	2.79	1.33	2.37	(1)
Fall	64.1	100	16	11.54	6.96	14.51	(1)
Year	62.6	103	2	55.89	35.26	90.14	3.9

[1] Trace.

AGRICULTURAL HISTORY AND STATISTICS

Since the days of early settlement, agriculture has been the chief industry in this county. At first, land along Neuse River was cleared for farming, because of its easy access to markets, its good drainage, and its sandy surface soil. The early settlers practiced a self-sufficing system of agriculture. Wheat, oats, rye, corn, cotton, peas, rice, and garden truck were grown, and cattle, hogs, and sheep were raised for a supply of meat.

During the period of settlement, the production of forest products consisting of lumber, turpentine, pitch, tar, and rosin was second to agriculture in importance. These products were largely exported, together with the surplus farm produce, deerskins, furs, and miscellaneous products. The production of lumber is still an important source of income, although the production of other forest products on a commercial scale has ceased.

The acreage devoted to the principal crops in the years 1879, 1889, 1899, 1909, 1919, 1929, and 1934 is given in table 2.

TABLE 2.—*Acreage of principal crops in Pamlico County, N. C., in stated years*

Crop	1879	1889	1899	1909	1919	1929	1934
	Acres	*Acres*	*Acres*	*Acres*	*Acres*	*Acres*	*Acres*
Corn	6,381	9,360	9,372	10,868	13,212	11,990	18,247
Cotton	4,585	5,722	3,614	7,978	10,770	4,983	1,947
Dry edible beans	--------	--------	3	110	1,465	2,772	(1)
Hay and sorghum for forage	83	124	878	3,088	3,307	2,612	4,535
Potatoes	--------	147	1,353	757	1,503	3,287	4,814
Sweetpotatoes	783	715	747	1,342	1,644	1,167	1,805
Tobacco	12	--------	43	--------	482	925	447

[1] Not reported.

In 1879 corn, cotton, and sweetpotatoes were the leading farm crops. Other important crops were rice, oats, and wheat. Corn remains the leading crop. The agriculture now is based on the production of corn, potatoes, cotton, tobacco, sweetpotatoes, and some truck crops. Of these, potatoes, cotton, and tobacco are the main cash crops.

The acreage devoted to corn increased steadily until 1919, decreased in 1929, and greatly expanded in 1934. Corn occupies a larger acreage than any other crop in the county. According to the census of 1935 there were, in 1934, 18,247 acres planted to corn that yielded 384,827 bushels, or 21 bushels an acre—a yield much higher than the average for the State. Corn is used to feed work animals, fatten hogs, and supply meal for home consumption.

The acreage devoted to cotton increased until 1919, after which it was sharply restricted.

Potatoes have been of increasing importance since 1889 and in 1934 ranked second among the farm crops in acreage. Pamlico County had a larger production of potatoes in 1934 than any other county in North Carolina, except Beaufort. In that year 4,814 acres were planted to potatoes, and the production was 1,120,671 bushels.

In 1934 tobacco was grown on 447 acres, yielding a total of 339,192 pounds. This acreage and yield are much smaller than those reported by the 1930 census for 1929.

Sweetpotatoes showed an increase in acreage until 1919, a decrease in 1929, but attained their greatest acreage in 1934 of 1,805 acres with a yield of 137,438 bushels.

Soybeans have gradually increased in importance since 1899, and they ranked fourth in acreage in 1929. They are utilized mainly for hay, and a small part of the crop is harvested for seed.

No rice and very little wheat have been grown since 1909. Only a small amount of oats and rye are produced. Oats are used almost exclusively as a winter cover crop, after which they are cut for hay.

Around nearly every home vegetables are grown for home use. A few farmers produce truck crops, such as English peas, cabbage, string beans, broccoli, and radishes for the market.

There has been considerable expansion in the numbers of livestock raised in the last 5 years. Hogs furnish the meat supply for a large number of people, and some hogs are sold as pork. According to the 1935 census, there were 364 horses, 1,131 mules, 1,770 cattle, 187 sheep and lambs, 6,465 swine, and a large number of chickens in the

county. Nearly all the cattle are of the dairy type. The sale of dairy products in 1919 amounted to $7,301, and of poultry and eggs to $119,039.

The total expenditure for fertilizer in 1929 was $204,506, an average of $282.46 for each of the 724 farms reporting its use. Most of the fertilizer is applied to potatoes, cotton, and early truck crops, such as English peas, cabbage, and broccoli. Applications ranging from 1,500 to 2,200 pounds an acre of 6–7–5[1] and 5–7–5 grades are customarily used on land for potatoes, and the fertilizer is applied a few days before the potatoes are planted. Land for cotton ordinarily receives from 400 to 700 pounds of 3–8–7 and 100 pounds of nitrate of soda as a side application. The land for sweetpotatoes is not fertilized, except on farms where these are one of the principal cash crops. Marl, burnt oystershells, or ground limestone are applied at intervals, in order to reduce the acidity of the soil.

Both white and colored laborers are employed at a reasonable price. Many farmers contract for their labor on a yearly basis. Under this arrangement, the average wage paid is 75 cents a day, plus house rent and fuel. During cotton picking and potato harvest, and in gathering vegetables, the workers, who are paid on a piece-work basis, earn from $2 to $2.50 a day.

In 1934, the size of farms averaged 82.3 acres, of which 31.8 were improved. Most of the farms range in size from 20 to 99 acres, and only a few are larger than 174 acres. Many farms are not in continuous tracts, but are composed of a number of cuts of land located in separate tracts.[2] The number of farms in the same year was 1,077, and the value of all farms (including land and buildings) was $3,087,743. Only about one-third of the farms were mortgaged. The percentage of foreclosures has been very small compared with some sections of the country.

According to the 1935 census only 39.6 percent of the land was listed as in farms. Most of the remainder is probably owned in large tracts by timber companies.

In 1935, 77.1 percent of the farms were operated by owners, 22.5 percent by tenants, and 0.4 percent by managers. Most of the land is rented on a share basis, and generally the landlord furnishes the team, tools, seed, and land, and receives one-half of the crop. If fertilizer is purchased, the expense is shared equally by landlord and tenant. When the tenant furnishes horses, feed, and implements, he receives two-thirds of the crop, and if fertilizer is purchased, he pays for two-thirds of it. Very little land is rented on a cash basis. When so rented the price ranges from $1.50 to $10 an acre, depending on the condition and location of the land.

Most of the farmhouses are large, substantial, and kept well painted, but many of the tenant houses are small, unpainted, and otherwise poorly kept. The barns and outbuildings are small unpainted structures, but they are ample to care for the livestock and other needs in this climate. The farm equipment depends to a large extent on the number of horses or mules used. Most farms are well supplied with carts, disk harrows, cultivators, and other tools. There

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

[2] In other localities cuts of land would be known as fields. They range in area from 3 acres upward. Ordinarily they are bounded by drainage ditches instead of fences. The width of the cuts ranges from 90 to 210 feet, depending on the kind of land.

are only a few tractors. Usually not more than two horses are hitched together. Fences, of both woven and barbed wire, are used largely around the pasture lots, but very little of the cultivated land is enclosed by fences.

SOILS AND CROPS

A wide variation exists in the texture, color, organic content, elevation, and drainage conditions of the soils. The soils range from areas of almost pure fine sand to areas composed almost entirely of organic matter. Since the climate is fairly uniform, the different soils bear a close relationship to the underlying parent material, from which they have been derived, and to drainage conditions. The proportion of light-colored well-drained soils is small compared to the percentage of similar soils in the higher part of the coastal-plain section of the State. In this county, there are large areas having black surface soils. This black color is caused by the growth and decay of vegetation over a long period when the soils were in a swampy or semiswampy condition.

The black soils, high in organic matter, have been classified and mapped as types of the Portsmouth, Bayboro, and Hyde series. The Bladen soils are lighter colored but have the same character of subsoil as the Bayboro. The Portsmouth soils have friable subsoils. The areas of fine sand are entirely different in their texture and structure in many of the soils. Particularly is this true of the rather large areas of Leon fine sand and St. Johns fine sand, which are characterized by well-defined hardpan layers consisting of fine sand held together by organic matter.

The relief of Pamlico County is dominantly flat or almost level. There has been practically no erosion or washing of the soils, except on a few sloping areas bordering some of the drainageways or swamps. Artificial drainage is one of the essential problems in crop production in the county.

Approximately 15 percent of the total area of the county is utilized as cropland, plowable pasture, and fallow land. There are extensive areas of inherently good soils, such as Bayboro loam and some of the Portsmouth loam, which are naturally poorly drained but could be reclaimed for agricultural purposes by artificial drainage. Some areas of Portsmouth loam, swamp phase, lie at so low an elevation that drainage is not feasible. Large areas of Pamlico muck, Leon fine sand, St. Johns fine sand, tidal marsh, and swamp are not suited for crop production because of inherently low fertility or adverse drainage conditions.

Considered on the basis of their agricultural value and on drainage conditions, the soils may be classed in four groups as follows: (1) Light-colored well-drained soils, (2) light-colored poorly drained soils, (3) black poorly drained soils, and (4) miscellaneous land types.

The map accompanying this report shows the location and extent of the different soils by means of colors. The character of the relief and also areas of the typical soils and their phases are designated by symbols. The soils shown on the map and described in the following pages have been identified and mapped on the basis of those properties that readily could be observed in the field or determined by simple tests. Emphasis has been placed on those important

characteristics of the soil which have an effect on the growth of cultivated crops, grasses, and trees. In other words, attention has been given to those features which the farmer takes into consideration in judging the agricultural value of his land.

A soil section, or profile, which may be exposed in road cuts or ditches, shows a number of horizontal layers, or horizons, commonly known as the surface soil, subsoil, and substratum, that do not owe their origin entirely to the parent material but are the result of biological, physical, and chemical changes that have taken place in the material since its deposition. Two kinds of parent materials occur in Pamlico County, and the soils overlying these materials differ in color, structure, and thickness of the surface soil and subsoil.

On the basis of their characteristics the soils are separated into series, types, and phases. The series is the broader group and may include a number of types. As now defined, the series consists of soils that have in common important features and properties, including the color, texture, structure, consistence, relief, drainage conditions, chemical components (including humus, lime, iron compounds, acids, and bases of various kinds), and the reactions produced by these substances. A soil series generally takes its name from the name of a place in the vicinity of which it was first mapped. The soil types within a series are separated on the basis of the texture of the surface soil, that is, the proportion of coarse sand, medium sand, fine sand, silt, and clay entering into its mechanical composition. The soil type is the unit of mapping, and the names given on the soil map and described in the report are those of soil types. The type takes the name of the series to which it belongs, plus the designation of the texture of the surface soil. For example, Bayboro loam takes the name of the locality in which the Bayboro soils were first mapped and loam indicates the texture. Minor variations within the type are called phases. For example, the swampy part of Portsmouth loam is designated as Portsmouth loam, swamp phase.

In the following pages, the soils are described briefly, and their relation to the agriculture of the county is discussed. In the latter part of the report is a section entitled "Morphology and Genesis of Soils", under which heading are discussed those features of the soils that are of special interest to the student and the scientist. Table 3 gives the acreage and proportionate extent of the various soils mapped.

TABLE 3.—*Acreage and proportionate extent of the soils mapped in Pamlico County, N. C.*

Type of soil	Acres	Per-cent	Type of soil	Acres	Per-cent
Norfolk fine sandy loam	3,200	1.5	Portsmouth loam	8,768	4.0
Norfolk fine sand	6,784	3.1	Hyde loam	1,792	.8
Dunbar fine sandy loam	6,208	2.8	Portsmouth loam, swamp phase	10,560	4.8
Moyock fine sandy loam	3,008	1.4	St. Johns fine sand	3,968	1.8
Craven very fine sandy loam	11,520	5.2	Leon fine sand	6,720	3.1
Lenoir very fine sandy loam	12,800	5.8	Pamlico muck	36,736	16.7
Bladen fine sandy loam	22,912	10.4	Swamp	9,856	4.5
Bladen very fine sandy loam	9,152	4.2	Tidal marsh	24,128	11.0
Bayboro loam	21,056	9.6	Coastal beach	64	.1
Portsmouth fine sandy loam	17,664	8.0	Made land	256	.1
Portsmouth fine sandy loam, sandy-subsoil phase	2,368	1.1	Total	219,520	------

LIGHT-COLORED WELL-DRAINED SOILS

Comprising the group of light-colored well-drained soils are Norfolk fine sandy loam, Norfolk fine sand, Dunbar fine sandy loam, Moyock fine sandy loam, and Craven very fine sandy loam. The combined area of these soils is 48 square miles, or 14 percent of the total area of the county. The texture, structure, and crop adaptation of the soils of this group differ widely. Norfolk fine sandy loam is considered the best soil in the county for the production of tobacco, peanuts, cotton, and early truck crops. Craven very fine sandy loam also is well-suited to these crops, but this soil differs from the Norfolk in that it has a much heavier subsoil. Dunbar fine sandy loam is not quite so well drained as the Norfolk and is mottled in the lower part of the subsoil, whereas Moyock fine sandy loam is more or less mottled throughout the profile and has a friable mealy consistence.

With the exception of Craven very fine sandy loam, which has a heavy subsoil, these soils warm early in the spring, because of the texture of their surface soils, the porosity and friability of their subsoils, their surface relief, and drainage conditions. They are easily tilled with hand tools and with improved farm machinery, and they are the first in the county on which farming operations begin after rains. The small content of organic matter and the comparatively low content of the mineral plant nutrients demand heavy fertilization, in order to produce the best results. These features, however, are an advantage with many crops, such as cotton, tobacco, and peanuts, with which early maturity and quality are important factors. These soils are responsive to good management and respond readily to fertilization and to the incorporation of green-manure crops and barnyard manure. They produce some of the most profitable crops in the county.

All the tobacco and the greater part of the cotton grown in the county are produced on these soils. A smaller proportion of the land is devoted to sweetpotatoes, corn, cowpeas, English peas, broccoli, potatoes, and soybeans.

Norfolk fine sandy loam.—Norfolk fine sandy loam is in many respects one of the most desirable soils for the production of cotton, sweetpotatoes, and bright-leaf tobacco. The surface soil in cultivated fields is light-gray or grayish-yellow loamy fine sand, to a depth ranging from 5 to 8 inches. In wooded areas the first 3 to 5 inches are darkened by the presence of organic matter. The surface layer is underlain by a pale-yellow or grayish-yellow loamy fine sand subsurface layer which extends to a depth of 12 or 15 inches. The upper part of the subsoil is yellow friable and crumbly fine sandy clay. In the flatter areas, the lower part of the subsoil, at a depth ranging from 26 to 30 inches, in many places is slightly mottled with gray or yellowish red. Below a depth ranging from 30 to 34 inches the subsoil grades into yellow, mottled and streaked with gray and yellowish red, friable fine sandy clay. Below a depth of 60 inches, this material grades into similarly colored stratified fine sandy clay which in places contains shells and other limy materials. Partial oxidation extends to undetermined depths.

In many places in cultivated fields spots of yellow fine sandy clay appear at the surface. In areas where this soil is associated with

Craven very fine sandy loam the subsoil is somewhat heavier and stiffer than in the typical soil. In a few areas in the vicinity of Merritt the material in the upper 18 inches is pale-yellow or gray loamy fine sand, and it is underlain by a subsoil which contains more sand than is typical. These areas are associated with Moyock fine sandy loam.

In the southwestern part of the county, in areas which have a varied relief, a modification of the typical soil occurs, in which the surface soil has a brownish-yellow or brown cast and the subsoil is brownish yellow or brown. In other counties where this modification is extensive the soil is mapped as Ruston fine sandy loam, but here it was included with the Norfolk soil because the small area involved did not justify separation on the map.

In a few areas the texture of the surface soil is very fine sandy loam instead of the more typical fine sandy loam. This results in a slightly greater tendency of the material to clod, and it is slightly harder to work. There is, however, little difference in the crop-producing capacity of such land.

Norfolk fine sandy loam occurs in scattered areas mainly in the southwestern part of the county. The largest areas lie between Olympia and Beard Creek and east of Beard Creek. Small areas occur along the north shore of Bay River near Lambert Point, and near Bayboro and Merritt.

The relief ranges from almost level to gently rolling. This characteristic, together with the porosity of the soil and the friability of the subsoil, insures good surface and internal drainage. The subsoil is sufficiently heavy to hold fertilizers and to retain ample moisture for growing crops.

Possibly 35 percent of the land is under cultivation. The soil warms quickly in the spring, is very easy to till, and responds readily to fertilization and the incorporation of green-manure crops. It is used principally for the production of cotton, tobacco, corn, and cowpeas. Cotton is commonly fertilized with from 400 to 700 pounds to the acre of 3–8–3 or 4–8–4. In addition to this many farmers use 100 pounds of nitrate of soda an acre as a side dressing. Yields of cotton range from one-half to slightly over 1 bale an acre. With proper care and fertilization average acre yields of high-grade cotton of nearly 1 bale are obtained.

Tobacco yields from 600 to 900 pounds an acre. It is ordinarily fertilized with 1,000 pounds to the acre of 3–8–3 or 3–8–5.

Corn and cowpeas are alternated with cotton, and ordinarily they are not fertilized. Under these circumstances corn yields range from 20 to 30 bushels, depending on the care, the season, and the residual effect of the fertilizer used for the cotton. Where corn is fertilized, the application ranges from 200 to 400 pounds of 3–8–3 an acre, sometimes supplemented by 75 to 100 pounds of nitrate of soda as a side dressing. This treatment results in increased yields.

A large acreage is devoted to sweetpotatoes, and some English peas, cabbage, and potatoes are grown. Garden vegetables, scuppernong grapes, and figs do well.

Norfolk fine sand.—Norfolk fine sand closely resembles Norfolk fine sandy loam in color. Areas of this soil border the highway running northward from Minnesott Beach. The largest areas are

developed on the shore of Neuse River and along Upper Broad, Goose, and Beard Creeks. This soil is associated with Leon fine sand and occupies slightly higher positions than that soil. The relief ranges from almost level to gently sloping, and in a few places there are low ridges or hummocks. Drainage ranges from good to excessive.

The topmost 6-inch layer of Norfolk fine sand is light-gray or grayish-yellow fine sand. It is underlain by pale-yellow or grayish-yellow fine sand which continues downward to a depth ranging from 20 to 30 inches, where it grades into pale-yellow loamy fine sand. At a depth ranging from 35 to 40 inches is mottled yellow, brownish-yellow, and gray material which ranges in texture from loamy fine sand to fine sandy clay. In forested areas the topmost 2- to 4-inch layer contains enough organic matter to give the material a dark-gray or brownish-gray color.

Only a very small proportion of this soil is cultivated; the rest is forested with longleaf and loblolly pines, and some scrub oaks. A few open areas, which were formerly cultivated, are now covered with broomsedge. This soil is used largely for timberland and for home sites, and at present it is best suited for these purposes. A small acreage is devoted to the production of corn, garden vegetables, and scuppernong grapes. Peanuts would yield fair returns if properly fertilized.

Dunbar fine sandy loam.—The 6- or 8-inch surface layer of Dunbar fine sandy loam is light-gray or dark-gray fine sandy loam. It is underlain by a subsurface layer of pale-yellow or grayish-yellow fine sandy loam which in places is slightly streaked with gray. The upper part of the subsoil, between depths of 12 and 18 inches, is typically yellow friable or crumbly fine sandy clay which is somewhat heavier than the corresponding layer in the Norfolk soil. Below a depth of 18 inches and extending to a depth ranging from 24 to 26 inches, the lower part of the subsoil is yellow, highly mottled with gray and brownish yellow, rather heavy fine sandy clay, in places containing splotches of yellowish red. Under ordinary moisture conditions this layer is friable and crumbly, but with an excess of moisture it becomes soft and plastic. The material below the subsoil is highly mottled gray, yellow, and brownish-yellow friable fine sandy clay which is slightly stratified at the lower depths. It is similar to the parent material under Norfolk fine sandy loam.

Included with Dunbar fine sandy loam are a few areas of very fine sandy loam texture. In the flatter and more poorly drained areas, the surface soil is dark gray and the subsoil is mottled yellow, gray, and brown.

Dunbar fine sandy loam is widely distributed. It occurs in small narrow strips in the central and western parts of the county. Some of the largest bodies are east of Arapahoe, in the vicinity of Bayboro and Stonewall, southwest of Vandemere, northwest of Grantsboro, in the vicinity of Olympia, and to the north of that town.

The typical areas of this soil are almost level or slightly undulating. Most of the land has fairly good surface drainage, but, for the best production of crops, flatter areas require artificial drainage, which can be effected by the use of open ditches, as the walls stand up well.

Cotton, corn, and soybeans are the principal crops grown. Small acreages are used for sweetpotatoes, potatoes, cowpeas, and other crops. This is considered a more favorable soil than Norfolk fine sandy loam for corn and soybeans, owing to the fact that it is less leached and has a higher content of organic matter in the surface soil. It does not produce quite such a good quality of tobacco as does the Norfolk soil. Methods of fertilization and land management are similar to those practiced on Norfolk fine sandy loam, except that possibly more soybeans are sown or planted with the corn. Sweetpotatoes, garden vegetables, and peanuts do well. Probably 25 percent of the Dunbar soil is under cultivation, and the rest is cut-over land which supports a fair growth of old-field pine and small oaks. This soil is capable of being built up to a fair state of productivity by turning under green-manure crops.

Moyock fine sandy loam.—Moyock fine sandy loam is closely related in color and other characteristics to Dunbar fine sandy loam. It differs chiefly from the Dunbar soil in that its subsoil is much more friable. The surface soil, to a depth of 5 inches, is typically medium-gray fine sandy loam. This is underlain by pale yellowish-gray, slightly mottled with yellow, fine sandy loam which extends to an average depth of 10 inches. The subsoil is yellow, mottled and streaked with yellowish gray and brown, fine sandy loam. The material in this layer is only slightly heavier than that in the surface and subsurface layers. At a depth ranging from 26 to 30 inches the subsoil is underlain by highly mottled yellow, gray, and brownish-yellow material which ranges in texture from loamy fine sand to fine sandy loam.

This soil is developed in numerous small areas and strips in the central part of the county along Trent River and on the south shore of Bay River. An area lies to the east of Pamlico.

Moyock fine sandy loam is not considered so productive as either Dunbar fine sandy loam or Norfolk fine sandy loam. It does, however, have a higher content of organic matter than those soils. It warms early in the spring and is very easily tilled. It is highly prized for the production of early truck crops, such as cabbage (pl. 1, *A*) and English peas, which depend for their growth on heavy applications of commercial fertilizers. It is extensively used for the production of spinach, kale, and broccoli. For English peas, a fertilizer application of 1,500 to 2,000 pounds an acre of 5–7–5 or 7–6–5 is used.

Approximately 20 percent of the land is under cultivation. The remainder is densely forested with a mixed growth of both hardwoods and conifers. Areas of this soil typically have level relief, and the land must be artificially drained before crops can be produced. Because of the loose friable character of the subsoil, however, the drainage ditches can be located at rather wide intervals.

Craven very fine sandy loam.—In many respects Craven very fine sandy loam resembles Norfolk fine sandy loam. It differs from the Norfolk soil chiefly in having a much heavier and stiffer subsoil and in having heavier material in the substratum. The surface soil in cultivated fields, to a depth of 5 to 7 inches, is grayish-yellow or light-gray very fine sandy loam. The subsurface soil, which extends to a depth ranging from 8 to 12 inches, is pale-yellow very fine sandy

loam slightly heavier than the surface soil. The subsoil is yellow stiff clay which is only slightly plastic when wet and, at a depth ranging from 24 to 28 inches, grades into highly mottled and streaked yellow, light-gray, dull brownish-yellow or, in some places, yellowish-red stiff tough clay. On drying the subsoil cracks and breaks into hard dense granules.

In a few places in cultivated fields the surface soil is yellow very fine sandy clay or clay, owing to the removal of the very fine sandy loam through surface erosion. Locally the texture of the surface soil is fine sandy loam.

Craven very fine sandy loam is developed in rather large areas in the southern part of the county. The largest and most continuous bodies are along Dawson Creek and Neuse River, east of Beard Creek, and north and west of Oriental, and many small strips are near Pamlico and south of Stonewall. Several fair-sized areas are developed in the western part of the county north and west of Scotts Store and east and north of Olympia.

This soil has an undulating to gently sloping relief, with some short steep slopes or breaks bordering the streams. Surface drainage ranges from fair to good, and only the flatter areas require artificial drainage.

About 20 or 25 percent of the land is under cultivation. The remainder supports a mixed growth of timber, in which white oak, scrub oak, and old-field pine are the common trees. This is considered one of the more desirable soils of the county.

The principal crops are tobacco, cotton, sweetpotatoes, and corn. Fertilizer applications for cotton and tobacco are similar to those made on Norfolk fine sandy loam. With good care and proper fertilization, tobacco yields from 700 to 1,000 pounds an acre. The soil is not quite so good for cotton as is Norfolk fine sandy loam, although yields of three-quarters of a bale or more are occasionally obtained. Yields in general run from one-half to three-fourths of a bale of high-grade cotton. Corn yields range from 20 to 35 bushels an acre. Sweetpotatoes are one of the main cash crops on Craven very fine sandy loam. Bigstem Jersey is one of the more popular early varieties. Sweetpotatoes are fertilized with from 600 to 1;000 pounds of 3–8–10 an acre. They are dug during July or August, and an average yield of 100 bushels an acre is obtained. Porto Rico and Nancy Hall are the more common later varieties. These are fertilized with 400 pounds of 3–8–5 an acre, and yields range from 100 to 125 bushels.

LIGHT-COLORED POORLY DRAINED SOILS

The light-colored poorly drained soils include Lenoir very fine sandy loam, Bladen fine sandy loam, and Bladen very fine sandy loam. These soils have gray or grayish-brown surface soils and mottled heavy clay or heavy plastic fine sandy clay subsoils. They occur in broad smooth nearly level areas. Large areas that do not have good natural drainage require artificial drainage to render them suitable for agricultural use. Practically all the cleared areas have been artificially drained, and more of these soils can be drained. These soils do not warm or drain so readily as the well-drained soils and are not considered so good for the production of cotton and

tobacco. They contain a larger quantity of organic matter than the soils of the first group. They are naturally acid, but this feature can be corrected by the application of a liberal quantity of lime.

These soils are used for the production of the staple farm crops. In addition the Bladen soils are used for the production of potatoes, yields of which are similar to those obtained on the Portsmouth and Bayboro soils.

Lenoir very fine sandy loam.—Lenoir very fine sandy loam is an imperfectly drained light-colored soil. In most places it is associated with the Craven or Bladen very fine sandy loams. It occupies flat areas where stream drainage is not established and water flows over the land in sheets. In places where it borders natural drainageways, the surface of the land is only a few inches higher than the water.

The surface soil typically is light-gray or gray very fine sandy loam, and in places the texture is fine sandy loam. Locally this layer contains brownish-yellow soft iron concretions, few of which exceed one-eighth of an inch in diameter. At a depth ranging from 5 to 8 inches, this layer is underlain by light-gray, mottled with yellow, very fine sandy clay which, at a depth ranging from 8 to 12 inches, merges with the gray stiff heavy clay subsoil mottled with dull brownish yellow and finer mottlings of brownish red or yellowish red. The material in this layer is tough and only slightly plastic when wet. On drying, it breaks into hard dense irregularly shaped granules. The subsoil is underlain by light-gray, strongly mottled with brownish yellow, tough heavy clay.

Southwest of Pamlico are small areas, in which the subsurface layer is dull brownish-yellow friable fine sandy clay loam with a high content of iron, and in places it forms a shallow hardpan.

Large areas of Lenoir very fine sandy loam are in the southern part of the county bordering Neuse River, west and east of Oriental, and southeast of Pamlico. Some bodies are developed in the vicinity and north of Florence.

Because of its tough heavy subsoil and substratum and its low-lying flat position, Lenoir very fine sandy loam is very difficult to drain. Ditches must be spaced at close intervals, in many places only 90 or 100 feet apart. Because of the shallowness and very fine texture of its surface soil and subsurface soil, this soil is considered by the farmers as heavy stiff land difficult to work. The common crops are cotton, alternating with corn and cowpeas, but this soil is not considered so productive as Norfolk fine sandy loam for these crops. Cotton yields range from one-third to three-fourths bale an acre and corn from 15 to 25 bushels. Cotton receives from 300 to 400 pounds of 3–8–3 fertilizer an acre, and corn a lighter application. Some farmers apply from 75 to 100 pounds of nitrate of soda as a top dressing. Where careful attention is given to its care and fertilization, this soil is maintained in a fair state of productivity, and yields ranging from three-fourths to 1 bale of cotton and from 30 to 40 bushels of corn are reported.

Only about 5 percent of the land is under cultivation, and the rest supports a mixed tree growth. Pond and loblolly pines are the dominant coniferous trees, and scrub oak is the most conspicuous deciduous tree.

Bladen fine sandy loam.—To a depth of 5 or 7 inches Bladen fine sandy loam is dark-gray or grayish-brown mellow friable fine sandy loam. In wooded areas the topmost 2 or 3 inches of soil are dark gray or brown, due to the presence of organic matter. Beneath the surface layer and extending to a depth ranging from 10 to 14 inches, is light-gray, slightly streaked or mottled with brownish yellow, fine sandy loam. The subsoil consists of steel-gray or bluish-gray, streaked and mottled with brownish yellow or brown, plastic clay or heavy plastic fine sandy clay. In most areas, below a depth of 40 inches most of the mottlings and streakings disappear, and the material is light-gray or steel-gray very plastic clay. The subsoil material is very plastic and soft when wet but on drying becomes very hard and strongly resistant to breakage.

Areas of Bladen fine sandy loam bordering the Norfolk and Dunbar fine sandy loams have lighter surface soils and more of the brownish-yellow mottlings than the typical soil. Bordering Lenoir very fine sandy loam, the clay subsoil of Bladen fine sandy loam is tough and heavy rather than soft and plastic.

Bladen fine sandy loam is one of the extensive and more important soils in Pamlico County. It occurs in rather large widely distributed areas. Some of the largest are developed along Bay River near Vandemere and Florence, between Florence and Pamlico, northwest of Oriental, and southwest and northwest of Grantsboro. Smaller areas are southeast and northwest of Arapahoe.

The relief is practically level, and natural drainage is poor. Open ditches are necessary to reclaim this soil for agriculture. The walls of the ditches stand up well, owing to the heavy character of the subsoil material.

Approximately 35 percent of the land is under cultivation, probably because most of the soil is in close proximity to natural drainage outlets and can be rather easily drained. The uncultivated areas support a growth of pines and hardwoods. Most of the merchantable timber has been cut.

The principal crops on this soil are potatoes, corn, cotton, and soybeans. Potatoes are fertilized with from 1,500 to 2,200 pounds an acre of 7–7–7 or 5–7–5, and yields range from 150 to 200 bushels. Yields of corn range from 25 to 35 bushels where fertilized with from 200 to 300 pounds of 3–8–3, and larger yields are obtained where corn immediately follows a crop of potatoes and receives the benefit of the residual fertilizer. Cotton yields from one-half to three-fourths bale an acre and is usually given an application ranging from 400 to 500 pounds of 3–8–3 or 4–8–4 fertilizer. Some farmers apply from 75 to 100 pounds of nitrate of soda an acre as a side dressing to corn and cotton. Soybeans do well but not so well as on the Bayboro and Hyde soils.

Bladen very fine sandy loam.—The 4- to 6-inch surface layer of Bladen very fine sandy loam consists of light-gray or slightly brownish gray mellow very fine sandy loam. When wet the color changes to gray or dark gray. It is underlain by light-gray very fine sandy clay which in places is slightly stained with dull brownish yellow. At a depth ranging from 10 to 15 inches this material is underlain by light-gray or bluish-gray plastic clay or heavy very fine sandy plastic clay. Below a depth of 60 inches this grades into similarly colored laminated clays.

Bladen very fine sandy loam occurs only in the central and southern parts of the county in extensive tracts. In many places it is so closely associated with Lenoir very fine sandy loam that the change from one soil to the other is very gradual. In many such places the surface soil is lighter colored than the typical soil, and the subsoil and underlying materials are heavier, tougher, and less plastic clay.

Approximately 20 percent of Bladen very fine sandy loam is under cultivation. Locally it is considered stiff land and is not thought quite so desirable for the production of potatoes and corn as Bladen fine sandy loam. It is, however, considered more desirable for cotton. Corn and soybeans are the main crops. Owing to its flat relief and its heavy subsoil and lower soil layers, Bladen very fine sandy loam is one of the most difficult soils in the county to drain. The shallow surface layer and heavier subsurface layer also make the use of farm machinery more difficult than on other members of the Bladen series or on the Portsmouth soils. Corn, cotton, and soybeans are given a fertilizer treatment similar to that for these crops on Bladen fine sandy loam.

BLACK POORLY DRAINED SOILS

The group of black poorly drained soils includes Bayboro loam, Portsmouth fine sandy loam, Portsmouth fine sandy loam, sandy-subsoil phase, Portsmouth loam, and Hyde loam. All these soils are black or very dark gray, due to the presence of a large quantity of organic matter. Their original condition was swampy or semi-swampy, and vegetation flourished, decayed, and became incorporated with the surface soil. The cultivated areas have been artificially drained, and other areas can be reclaimed for agricultural use by the construction of canals and lateral ditches.

These are inherently the best soils in the county. They are especially well adapted to the production of potatoes, corn, cabbage, and soybeans. They are not considered so good for cotton as the lighter colored and better drained soils, as this crop is too slow in reaching maturity.

Bayboro loam is differentiated from the Portsmouth soils and Hyde loam because of the heavy character of its subsoil, and Hyde loam is separated from Portsmouth loam because of its black color to a depth ranging from 3 to 5 feet, in contrast to the dark color of the Portsmouth soil, which, in most places, continues to a depth ranging from 8 to 14 inches. Owing to the heavy applications of commercial fertilizers used, there is very little difference in the yields of potatoes on the Bayboro and Portsmouth soils.

Bayboro loam.—Bayboro loam differs essentially from the Bladen soils, with which it is closely associated, in having a black surface soil. Bayboro loam, to a depth ranging from 6 to 12 inches, is black or very dark gray mellow friable loam containing a large quantity of well-decomposed organic matter. In places the surface originally was covered with muck, and in some places the muck has been burned over, leaving small particles of charred organic remains and a noticeable quantity of gray fine sand which has beaten out on the surface. Underlying the topsoil is a layer, ranging from 2 to 5 inches in thickness, of light-gray, slightly mottled with brown, heavy fine sandy loam. The subsoil is light-gray or steel-gray, mottled and

A, Cabbage on Moyock fine sandy loam northeast of Bayboro; *B*, potatoes on Bayboro loam.

A, Typical view of cut-over timberland on Leon fine sand near Grantsboro; *B*, tidal marsh northeast of the Trent River bridge.

streaked with brownish yellow, heavy plastic clay or heavy plastic fine sandy clay. Below a depth of about 40 inches, the brownish-yellow streaks largely disappear. In some places, at the lower depths, fragments of shells or marl occur, but generally the underlying material is heavy gray or steel-gray clay. In places where this soil borders Hyde loam and the Portsmouth soils, the subsoil is heavy plastic fine sandy clay to a depth of 12 or 15 inches.

Bayboro loam is widely distributed and is developed in broad continuous areas in the southern and western parts of the county. The largest bodies lie northeast of Olympia, in the vicinity of Reelsboro, east of Scotts Store, and west of the Norfolk Southern Railroad between Oriental and Bayboro. Small areas lie north and northeast of Whortonsville, north of Mesic, and west of Cash Corner. The greater part of this soil is closely associated with Pamlico muck. The relief is almost uniformly flat and low lying. Drainage is naturally poor. Ditch and canal banks stand up well, owing to the heavy plastic character of the subsoil and substratum. Water goes through the subsoil material slowly, therefore drainage ditches should be spaced comparatively close together.

From 10 to 15 percent of the land is under cultivation, and the rest, where it borders the pocosins, supports a heavy growth of gum, and in other places, pines, oak, and gum. Inherently this is one of the best soils in the county. It is particularly well suited to the production of corn and soybeans and fairly suitable for potatoes (pl. 1, *B*) and cabbage. Corn yields from 25 to 50 bushels an acre with the use of but little commercial fertilizer, but liberal applications of lime are beneficial. Yields of potatoes range from 175 to 225 bushels an acre on fields fertilized with from 1,500 to 2,000 pounds an acre of 7–7–7 or 5–7–5. Cabbage yields well and is heavily fertilized. If and when the demand for more corn and soybeans warrants their production, more Bayboro loam can be reclaimed for agricultural purposes.

Portsmouth fine sandy loam.—Portsmouth fine sandy loam, to a depth ranging from 8 to 12 inches, is very dark gray or black fine sandy loam having a large content of organic matter. In places in fields which have been under cultivation a long time, a small quantity of light-gray fine sand is beaten out on the surface. Beneath the very dark gray layer is gray or light-gray, slightly stained or mottled with brownish yellow, fine sandy loam. The subsoil, beginning at a depth ranging from 15 to 20 inches, is light-gray, mottled with yellow or brown, friable but slightly sticky fine sandy clay. Bordering areas of Moyock fine sandy loam, the surface soil is somewhat lighter colored, and there is also more yellow in the subsoil. On Goose Creek Island small areas of the Moyock soil are included with the Portsmouth.

Portsmouth fine sandy loam has a rather wide distribution throughout the northern half of the county. The largest areas lie north of Grantsboro and Alliance, in the vicinity of Maribel, north of Cash Corner, and north of Hobucken. A long narrow strip is between Arapahoe and Grantsboro.

The relief is low and flat, and natural drainage is poor. All the cultivated land has been artificially drained by open ditches leading

into canals or natural drainageways. In most places the water table is near the surface. More of this land could be drained and reclaimed for agricultural purposes.

Approximately 20 percent of the land is under cultivation. Corn, potatoes, cabbage, and soybeans are the principal crops. Corn yields from 25 to 40 bushels an acre in fields where from 300 to 400 pounds of 3–8–3 fertilizer are applied. Generally corn is not fertilized when it follows a crop of potatoes that have been heavily fertilized. Potatoes yield from 175 to 225 bushels an acre and are fertilized with from 1,500 to 2,200 pounds of 7–7–7, 6–6–5, or 5–7–5 grades of fertilizer. Cabbage return good yields when the land is given heavy applications of a high-grade fertilizer. Garden vegetables, including onions and eggplant, are grown successfully. As this soil is strongly acid, it requires heavy applications of lime for best results from corn and soybeans. This is considered one of the good soils in the county.

Portsmouth fine sandy loam, sandy-subsoil phase.—The sandy-subsoil phase of Portsmouth fine sandy loam differs mainly from Portsmouth fine sandy loam in that it has a much more sandy and friable subsoil.

The surface soil of this phase of Portsmouth fine sandy loam, to a depth ranging from 10 to 15 inches, is black or dark-gray light-textured fine sandy loam or loamy fine sand. In some places the material is mellow and friable. This layer is underlain by gray, slightly mottled with brownish yellow or brown, fine sandy loam which, at a depth ranging from about 20 to 24 inches, grades into gray, slightly mottled with yellow, loamy fine sand.

Soil of this phase is inextensive and occurs mainly east of Merritt and along Bay River toward Florence. The land is flat and requires artificial drainage. All the cultivated land is drained by open ditches.

Probably 50 percent of this soil is under cultivation. Potatoes and corn are the main crops and yield well. Potatoes are heavily fertilized. Methods of soil management and fertilization are similar to those practiced on Portsmouth fine sandy loam, and crop yields also are practically the same.

Portsmouth loam.—Portsmouth loam occurs in large areas in the eastern part of the county. The largest bodies are developed north and east of Hobucken, east of Lowland, near Vandemere, north of Alliance, and between Oriental and Merritt.

The surface soil, to a depth ranging from 10 to 15 inches, is black mellow friable loam containing a large quantity of well-decomposed organic matter. This grades into gray, slightly mottled with brownish yellow, loam or fine sandy loam, which extends to a depth ranging from 18 to 24 inches. Below this is light-gray, mottled with yellow or brown, friable fine sandy clay.

This soil occupies low flat areas and has poor natural drainage. Most of it, however, is sufficiently high that it may be drained by canals and open ditches. The soil is strongly acid, and heavy applications of lime are beneficial, especially where corn and soybeans are the main crops. The greater part of the land is forested with sweetgum, together with a few oaks and pines. Portsmouth loam is productive and, where drained and reclaimed, from 30 to 60 bushels

of corn an acre can be obtained with the use of from 300 to 500 pounds of 3–8–3 fertilizer, together with liberal quantities of lime. Soybeans do well. Potatoes and cabbage are grown satisfactorily. These crops are heavily fertilized with a high-grade mixture. Yields compare favorably with those obtained on the other Portsmouth soils and Bayboro loam.

Hyde loam.—Hyde loam is most extensively developed as a narrow band surrounding the pocosin south of Bayboro. Very small areas occur in other parts of the county closely associated with the Bayboro and Portsmouth soils.

The 24- to 30-inch surface soil is mellow friable black loam containing a large quantity of well-decomposed organic matter. The subsoil is gray, or gray mottled with brownish yellow, fine sandy loam, sandy clay loam, or clay. Where this soil borders areas of Pamlico muck, the transition between the two soils is gradual and may extend over a considerable distance.

Hyde loam is developed in slight depressions or low flat areas. It is all naturally poorly drained, and the greater part lies at considerable distance from natural drainageways. Most of it supports a heavy growth of gum. Artificial drainage is necessary in order to reclaim it for agricultural use. In eastern North Carolina, when this soil is drained and reclaimed, it is considered one of the best soils for the production of corn and soybeans. Liberal applications of lime, phosphorus, and potash are beneficial.

MISCELLANEOUS LAND TYPES

This group includes Portsmouth loam, swamp phase, Leon fine sand, St. Johns fine sand, Pamlico muck, swamp, tidal marsh, coastal beach, and made land. There is a wide range in the character of these materials and in their drainage conditions. Leon fine sand is composed almost entirely of fine quartz sand and is practically devoid of organic matter, whereas Pamlico muck consists mainly of organic matter and has a very low content of mineral matter. Perhaps less than 1 percent of the total area of the soils of this group is farmed. Scant pasturage is obtained from tidal marsh and the fine sands. Leon fine sand and St. Johns fine sand are best suited for the production of trees. Portsmouth loam, swamp phase, lies at such low elevations that drainage is not practical under present economic conditions.

Portsmouth loam, swamp phase.—Portsmouth loam, swamp phase, is differentiated from typical Portsmouth loam because of its very low position and extremely poor drainage. As it lies at elevations ranging from only a few inches to 3 feet above sea level, it is not high enough to be drained artificially.

This swampy land occurs in a few large areas in the eastern and northeastern parts of the county. The largest bodies are north of Oriental extending northeast to Merritt, west of the Inland Waterway, and north and northeast of Hobucken. In the northeastern part of the county this soil adjoins tidal marsh.

The best use for the swamp phase of Portsmouth loam is for forestry. Possibly some of it could be used for growing a few aquatic grasses. Much of the original timber has been cut, but considerable gum and oaks, together with some pine, remain.

St. Johns fine sand.—St. Johns fine sand occurs in several small areas in the western part of the county, associated with Leon fine sand. The 8- to 10-inch surface soil consists of dark-gray or black fine sand containing a large quantity of well-decomposed organic matter. In some places the surface soil is very mucky. This layer is underlain by brown or gray fine sand which, at a depth ranging from 12 to 24 inches, grades into black or dark-brown fine sand cemented by organic matter. In most places this layer is from 4 to 8 inches thick and is similar to the hardpan developed in Leon fine sand. The upper part of the hardpan layer is black, hard, and brittle, but in some places it is only slightly compact brown fine sand. It does not allow free downward movement of water, and the rise of soil water also is hindered.

Included with this soil as mapped are small areas of Portsmouth fine sand and Plummer fine sand.

St. Johns fine sand is developed in flats and slight depressions. It is everywhere poorly drained, and water remains on the surface during wet seasons. Ditch banks and walls of canals will not stand up well in the loose sand below the hardpan. This soil supports a growth of gnarled loblolly and pond pines, baybushes, gallberry, briers, and other swamp vegetation. None of the land is cleared, drained, or farmed, and it is best suited to forestry.

Leon fine sand.—Leon fine sand, to a depth ranging from 3 to 5 inches, is gray or dark-gray fine sand containing a small quantity of organic matter. This is underlain by white or grayish-white loose incoherent fine sand, streaked here and there with yellow iron stains, which continues to a depth ranging from 12 to 20 inches. This material, in turn, is underlain by a black or very dark brown hardpan consisting of fine sand cemented with organic matter. In most places, the hardpan layer ranges from 4 to 8 inches in thickness. The upper part is hard, brittle, and black, and the lower part is soft and gradually changes to brownish-yellow fine sand which at a depth ranging from 3 to 4 feet, passes into gray fine sand.

Included with Leon fine sand in mapping are small areas of Portsmouth fine sand. The surface soil in these areas consists of black fine sand to a depth ranging from 10 to 15 inches, and the underlying material is gray fine sand slightly mottled with yellow or brown. In a few places there are included small areas of St. Johns fine sand and Norfolk fine sand, also small areas of Plummer fine sand which is light-gray or gray fine sand underlain by light-gray fine sand. In places Leon fine sand might more correctly be termed a soil condition rather than a definite type, because of its variable soil or spotty occurrence.

Leon fine sand occurs only in the western part of the county. The largest continuous areas occupy a ridge along the highway extending from Minnesott Beach northward beyond Bennett. This ridge marks the boundary between the lower lying flat country to the east and the slightly higher flat country on the northwest. Other large areas are in the southwestern corner north of Neuse River, and there are bodies between Upper Broad and Goose Creeks and west of Reelsboro.

The relief is almost level or undulating, and drainage is poor. The hardpan layer prevents the downward movement of rain water and

also interferes with the rise of capillary soil moisture. This soil, particularly the hardpan layer, is strongly acid.

Practically none of the land is cultivated. This is inherently a soil of extremely low fertility. Most of it is forested to longleaf and loblolly pines, together with a few scrub oaks on the better drained parts. Baybushes, myrtle, and gallberry form the undergrowth in the poorly drained areas. The best use of Leon fine sand is for forestry. Plate 2, *A*, shows a typical area of cut-over timberland on this soil.

Pamlico muck.—Pamlico muck occurs in three extensive areas known as pocosins—one in the northwest corner of the county, one in the northern part along the Beaufort County line north of Bayboro, and a third in the west-central part southwest of Bayboro. The centers of these areas are for the most part treeless and covered by reeds. In most places the margins are forested with a few twisted, gnarled loblolly and pond pines, and they support an undergrowth of gallberry, myrtle, baybushes, small shrubs, mosses, ferns, and various briers. In other places the vegetation on the margins consists of gums and cypress.

Several types of organic soils have been included on the map with Pamlico muck. In the more typical profile, the upper 10- to 15-inch layer of material is very dark brown or black well-decomposed organic matter containing some woody particles and a small proportion of mineral matter. On drying the material cracks and breaks into hard dense granules. Below a depth of 15 inches and continuing to a depth ranging from 30 inches to 8 feet, the material is a very dark brown fairly well decomposed organic material, in which only the larger woody fragments, such as cypress roots, have retained their original structure. The main mass is highly colloidal, and when wet it breaks into gellike masses which on drying break into hard dense forms. This material is underlain by light-gray fine sand and in places by clay beds which have a high content of shells and other limy materials. Pamlico muck is strongly acid.

In cypress swamps and other places, where there has been a profuse growth of mosses and ferns, the surface layers may be dark-brown fibrous material, and the underlying material not so gellike but more woody and fibrous.

Only in the vicinity of Bay City has any agricultural development been attempted on Pamlico muck. Here main drainage lines have been constructed, which have lowered the general level of the water table. In undrained areas the water table remains within a few inches of the surface throughout the year. To increase the productivity of the land in this vicinity, small tracts of muck have been limed with marl dredged from the bottoms of drainage ditches. The land has been repeatedly burned over and is covered in most places by charred irregular-shaped granules of organic material. In places a noticeable quantity of fine sand is exposed on the surface. The sand existed originally as impurities in the muck and now has been exposed largely through burning of the organic material. In many places holes ranging from 2 to 4 feet in depth have been burned into the ground. The land in most of this drainage district is covered with briers, gallberry, myrtle, and small twisted pines. Only small areas have been farmed, and these have been used for

growing corn which does fairly well for 2 or 3 years on limed land, but yields decline rapidly. One of the difficulties of managing Pamlico muck is the practical control of the water table.

Swamp.—Swamp occurs only in long narrow strips in the first bottoms along streams, mainly in the western part of the county. The largest areas are along Goose and Upper Broad Creeks. At the headwaters of Goose Creek, an area borders Pamlico muck. Narrow strips of swamp are along Trent River and at the headwaters of Vandemere Creek. Swamp is covered with water the greater part of the time or remains permanently wet. The water covering and saturating the swamp areas is fresh. This land lies too low for natural drainage.

In this county swamp includes a variety of materials, ranging from muck and peat to heavy mineral soils. The color, texture, and structure are extremely variable. In many places, below a depth ranging from 20 to 30 inches, the material is medium-gray fine sandy loam, fine sand, or even heavy plastic clay.

Swamp has no agricultural value, except for the production of timber, and it supports a heavy growth of cypress and gum. Its best use is for forestry.

Tidal marsh.—Tidal marsh occurs in large continuous areas, indented by numerous bays in the extreme eastern end of the county. It borders Pamlico Sound, Jones Bay, Bay River, Trent River (pl. 2, *B*), and Neuse River. A few small areas are developed in the extreme southwest corner, near the confluence of Goose and Upper Broad Creeks and Neuse River. The land is subject to inundation by tidewater.

Tidal marsh consists of gray silt loam or very fine sandy loam or of dark-brown mucky material. In places, at a depth ranging from 20 to 30 inches, the texture becomes silty clay loam, and the material is gray or mottled gray and brown. In places where tidal marsh borders Porstmouth fine sandy loam or Bayboro loam, the topmost material is dominantly black or gray loam or silt loam, underlain by steel-gray rather heavy plastic clay.

Tidal marsh is covered by a dense growth of sedges, rushes, and various coarse grasses. The grasses furnish some grazing for cattle. On some of the very slightly elevated areas, which are not inundated except at times of high tide, small pine trees grow. Aside from the scant pasturage it affords, this type of land, under present conditions, has little agricultural value.

Coastal beach.—Two very small areas of coastal beach are mapped, one at Minnesott Beach and the other east of Janeiro. This material consists of yellow or almost white fine sand to a depth of 10 or more feet. It occupies slight ridges paralleling and sloping toward Neuse River. The land is everywhere well drained. It furnishes a good beach for bathing purposes but has no agricultural use.

Made land.—Made land occurs in narrow strips along the Inland Waterway in the northeastern part of the county. It consists of a mixture of materials which, when pumped or dredged out during the construction of the Inland Waterway, were dumped on areas of Portsmouth soils. The material is variable in texture and other characteristics. It consists of fine sands, clays, and light-gray calcareous material. In places it contains numerous highly calcareous

fragments of shells. It ranges in elevation from 6 inches to 3 feet or more above tidal marsh and the Portsmouth soils. At present it has no agricultural value, but as this composite material develops into a soil, it may have some possibility for agricultural purposes.

MANAGEMENT OF THE SOILS OF PAMLICO COUNTY

Many farmers are making excellent use of their soil with regard to the proper crop adaptation of the soil and the market demand for crops. It has long been recognized that large yields of potatoes can be produced on the dark-colored or black soils when the land is properly fertilized. In many places two or more crops a year are obtained from the same soil, that is, potatoes may be grown in early spring, and after this crop is harvested, corn or cowpeas may be planted. Thus, the secondary crops receive the beneficial effects from the residual fertilizer not used by the potatoes.

The best farmers recognize that the Norfolk, Dunbar, Craven, Moyock, and Lenoir soils are deficient in organic matter, therefore, they grow such leguminous crops as soybeans, cowpeas, and vetch to supply organic matter. Only a small quantity of barnyard manure is available, as only a few cattle are kept. It is generally considered that tobacco and cotton give the best returns on Norfolk fine sandy loam and Craven fine sandy loam. Cotton does well on the Dunbar and Moyock soils and on the lighter textured members of the Bladen series.

All the soils in this county are acid to more or less degree. Pamlico muck is extremely acid, and Bladen fine sandy loam is the most acid mineral soil. In a few places calcareous materials, in the form of marl, underlie some of the soils at a depth ranging from 50 to 60 inches. But even here the surface soils and subsoils are acid. In general, the soils of the Bladen, Bayboro, Portsmouth, and Hyde series, all of which are high in organic matter, are strongly acid. Many farmers apply lime to these soils in growing certain crops. Before lime is used on any soil the acidity of the soil should be determined, as this is an indication of the necessary quantity of lime to be added.

Some crops are much more tolerant to acidity in the soil than others. For example, potatoes and sweetpotatoes grow best on soil having a pH value ranging from 5 to 5.8. Cowpeas may be grown successfully on soils having a pH value ranging from 5 to 6.5; corn, cotton, grasses, oats, and velvetbeans on soils having a pH value ranging from 5 to 6; tobacco on soils having a pH value ranging from 5 to 5.6; cabbage, lespedeza, and peanuts on soils having a pH value ranging from 5.5 to 6.5; and spinach on soils having a pH value ranging from 6 to 6.5. Many farmers use marl which can be easily obtained in some places in the country, burnt oystershells, or ground limestone to correct soil acidity.

Drainage is one of the most essential factors in crop production in this county. Large areas of Bladen, Bayboro, Portsmouth, and Hyde soils could be utilized profitably for the production of crops if they were adequately drained. Practically all of the cultivated areas are artificially drained by means of canals and open ditches. Portsmouth loam, swamp phase, lies so low that drainage would be

difficult. This soil, together with some of the soils classed under miscellaneous land types, should be utilized for the production of timber.

Many farmers have found it profitable to establish permanent pastures. For this purpose Bermuda grass is satisfactory on the well-drained areas. Carpet grass, lespedeza, and Dallis grass constitute a good mixture to use on poorly drained soils. Lespedeza is well suited to most of the soils, makes satisfactory pasture, and can be turned under to improve the soil.

Definite systems of crop rotations are not practiced by all the farmers, but many of them follow the potato crop in June with corn, corn and soybeans, or corn and cowpeas, and in some places with sweetpotatoes. On some soils, cotton is alternated with corn and soybeans or cowpeas. Some farmers follow the sweetpotato crop with oats in the fall, and these are turned under the following spring to improve the soil. In recent years the turning under of leguminous crops and the use of heavy applications of fertilizer have resulted in increased crop yields.

The leading varieties of corn are Truckers Favorite, Lathams Double, and Golden Dent. Most of the farmers select as their cotton varieties Half-and-Half, Cleveland Big Boll, and Wannamaker. The principal varieties of sweetpotatoes are Nancy Hall, Porto Rico, and Big Stem Jersey.

The North Carolina Agricultural Experiment Station has conducted field experiments on soils similar to those in Pamlico County, and on the basis of these experiments recommends the following applications of fertilizer:

Cotton on Norfolk, Dunbar, or Moyock fine sandy loams or on Craven or Lenoir very fine sandy loams should receive from 400 to 600 pounds an acre of 4–8–4. On Norfolk fine sandy loam and Craven very fine sandy loam this fertilizer treatment should be supplemented by a side application of about 75 pounds of nitrate of soda. On all soils of the Bladen, Portsmouth, and Hyde series cotton should receive from 400 to 500 pounds of 4–10–4.

Corn should receive from 300 to 400 pounds of 4–8–4. When grown on Norfolk fine sandy loam or Craven very fine sandy loam, however, it should receive in addition a side application of about 75 pounds an acre of nitrate of soda; and if grown on Dunbar or Moyock fine sandy loams or Lenoir very fine sandy loam, it should receive an application of 50 to 75 pounds an acre of nitrate of soda. On Bladen, Portsmouth, or Hyde loams, 250 or 300 pounds of a 4–8–4 fertilizer is sufficient.

Early potatoes should receive 1,600 pounds of 5–7–5 when grown on the Bladen, Portsmouth, and Hyde loams, and on other soils, 2,000 pounds of the same formula. When grown on Norfolk fine sandy loam or Craven very fine sandy loam this treatment should be supplemented by a side application ranging from 100 to 150 pounds an acre of nitrate of soda.

Sweetpotatoes when grown for an early crop should receive from 1,000 to 1,200 pounds of 3–8–8 and when grown for a late crop from 600 to 800 pounds of the same formula.

Tobacco on Norfolk fine sandy loam or Craven very fine sandy loam should receive from 800 to 1,000 pounds of 3–8–6. If this crop

follows a leguminous crop which has been turned under (but this is not generally recommended), 800 pounds of 2–10–6 are recommended. When grown on Dunbar or Moyock fine sandy loams or Lenior very fine sandy loam, tobacco should receive from 800 to 1,000 pounds of 3–10–6. If it follows a leguminous crop on these soils, the formula should be 2–10–6.

Small grains should receive from 250 to 400 pounds an acre of 4–8–4. When grown on Norfolk fine sandy loam or Craven very fine sandy loam this treatment should generally be supplemented by 75 to 100 pounds of nitrate of soda, and when grown on Dunbar or Moyock fine sandy loams or Lenoir very fine sandy loam it should be supplemented by 50 to 75 pounds of nitrate of soda. Vegetables adapted to the soils should receive from 1,000 to 2,000 pounds an acre of 5–7–5. If the heavier application is used, it should be broadcast.

Legumes should receive from 200 to 300 pounds an acre of 2–8–4 when grown on Norfolk fine sandy loam or Craven very fine sandy loam. When grown on Dunbar or Moyock fine sandy loams or Lenoir very fine sandy loam, they should receive from 200 to 300 pounds of 2–10–6, and on soils of the Bladen, Portsmouth, or Hyde series, they should receive 200 pounds of 0–10–6.

Land for grasses should be given from 200 to 400 pounds of 4–8–4, the lighter applications being made on the Bladen, Portsmouth, or Hyde loams.

For most crops, at least 20 percent of the total nitrogen in the fertilizer mixture should be derived from standard organic sources. The nitrogen in the fertilizer applied on tobacco land should be composed of one-third nitrate nitrogen, one-third other standard inorganic nitrogen, and one-third organic nitrogen derived from cottonseed meal or other standard organic sources. Tobacco fertilizers should carry 2 percent each of magnesium oxide and chlorine.

Heavy applications of fertilizer for sweetpotatoes, potatoes, or vegetables, should not contain more than 5 percent of chlorine, as an excess of this element might injure the crops during the early stages of growth. If more than 500 pounds of fertilizer to the acre are applied, it is considered better practice to mix the fertilizer thoroughly with the soil at least a week before planting. It is considered good practice to apply three-fifths of the fertilizer to the land for tobacco before the plants are transplanted and the rest as a side application after the first or second cultivation, if the land is of an open, leachy character.

Further information on fertilizers, liming, rotation of crops, and soil building may be obtained from the following publications:

North Carolina Agricultural Experiment Station Agronomy Information Circulars 2, Fertilizers Recommended for Important Crops of North Carolina Based upon Field Experiments; 4, Soil Acidity and Lime for North Carolina Soils; 11, Results of Soil Building Demonstrations in North Carolina; 66, Legume Inoculation; 68, The Part Legumes Play in Maintaining the Productiveness of North Carolina Soils; 73, Crop Rotation as a Material Aid to Soil Productiveness; 96, Fertilizer Recommendations for Important Crops of the Agricultural Regions of North Carolina; and 97, Suitable Fertilizer Mixtures for Different Crops including the Function of the Chief Plant Nutrients.

North Carolina Agricultural Experiment Station Bulletins 262, Value of Lime on Norfolk sandy loam; and 293, Agricultural Classification and Evaluation

of North Carolina Soils, Including the Fertilization of Crops on Soil Groups.
North Carolina Agricultural College Extension Circular 165, Crop Rotations for the Coastal Plain Section of North Carolina.
United States Department of Agriculture Technical Bulletin 335, Fertilizers for Sweetpotatoes Based on Investigations in North Carolina.

MORPHOLOGY AND GENESIS OF SOILS

Pamlico County lies in the seaward or flatwoods section of the Atlantic Coastal Plain and is in the Red and Yellow soils region of the United States. The general elevation of the land is so low that a part of the county is inundated during tidal storms which occasionally take place along the coast. Because of the prevailing low elevation, natural drainage or stream incision is poor. The greater part of the land is indented by numerous tidal streams or estuaries. Erosion has played practically no part in the destruction of the original material as laid down by the sea.

The soils have developed under a forest cover consisting of pine and hardwoods. In this section the well-drained soils have had no opportunity to accumulate an appreciable amount of organic matter. The average annual rainfall is about 56 inches, and there is a frost-free period of 224 days. Except for a brief time during the winter, leaching is continuous. The black soils have developed under swampy and semiswampy conditions favorable to the heavy growth and decay of vegetation for a long period, and a large amount of organic matter has accumulated.

All the soils are acid to more or less degree. The leaves, and pine needles in particular, which fall on the ground, are acid. Pamlico muck, an organic soil, is the most strongly acid type in the county. Of the mineral soils, Bladen fine sandy loam and Bladen very fine sandy loam are the most acid. The results of pH determinations on several soil profiles in Pamlico County are given in table 4.

TABLE 4.—*Results of pH determinations on six soil profiles in Pamlico County, N. C.*[1]

Soil type and sample no.	Depth	pH	Soil type and sample no.	Depth	pH
Portsmouth loam:	*Inches*		Bladen fine sandy loam:	*Inches*	
239201	0-12	4.9	239211	0- 7	4.4
239202	12-30+	4.4	239212	7-11	4.5
Craven very fine sandy loam:			239213	11-40+	4.5
239203	0- 4	5.3	Pamlico muck:		
239204	4-10	5.4	239214	0-15	3.9
239205	10-26	5.0	239215	15-40	3.9
239206	26-40+	5.0	Moyock fine sandy loam:		
Lenoir very fine sandy loam:			239216	0- 5	5.1
239207	0- 5	5.0	239217	5-10	5.6
239208	5-11	4.4	239218	10-26	4.8
239209	11-40	4.6	239219	26-40+	4.8
239210	40+	4.9			

[1] Determinations made with the hydrogen electrode, by E. H. Bailey, Bureau of Chemistry and Soils.

The underlying soil-forming material consists of beds of heavy clays and fine sandy clays, which are of recent geological age and deposition. The soil-forming agencies have developed markedly different soils from the weathered and partly weathered parent material. The character of the parent material, together with drainage conditions, determines largely the type of soil which has developed.

For example, the parent material under the Norfolk, Moyock, Dunbar, and Portsmouth soils is dominantly fine sandy clay, whereas that under the Bayboro, Lenoir, and Bladen soils is heavy clay. The Norfolk and Portsmouth soils are very different, although they are underlain by the same parent material. This difference is due to the long-continued imperfect drainage which the Portsmouth soil has undergone.

Most of the soils do not have normally developed soil profiles, owing largely to imperfect drainage which has impeded the normal processes of soil formation. The water table has remained near the surface over the greater part of the county. The various stages of soil development, constituting an ascending series from the youngest to the most mature soils, may be illustrated by tidal marsh, Bayboro, Bladen, Craven, Dunbar, and Norfolk soils.

Norfolk fine sandy loam, which belongs to the group of Yellow soils, is the only soil with a normal profile. In this soil there are an eluviated A horizon; an illuviated B horizon which is of uniform texture, structure, and definite consistence; and a C horizon which is variable in texture, color, and consistence. Very little eluviation has taken place in any soils except the Norfolk, Dunbar, and Bladen fine sandy loams. A description of a profile of Norfolk fine sandy loam on a gentle slope 1 mile east of Olympia follows:

A_1. 0 to 4 inches, light-gray loamy fine sand containing a small quantity of organic matter. On the surface is a covering of pine needles and other organic debris.

A_2. 4 to 13 inches, grayish-yellow loamy fine sand or light fine sandy loam, which is mellow, friable, and of single-grain structure. The material contains practically no organic matter.

B_1. 13 to 26 inches, yellow friable fine sandy clay which breaks into irregular lumps that are easily crushed into a fine mealy mass without definite structural characteristics. This layer is uniform in color and is the illuviated part of the profile.

B_2. 26 to 36 inches, yellow or slightly brownish-yellow friable fine sandy clay which is somewhat heavier than the material in the overlying layer.

C_1. 36 to 60 inches, yellow, mottled and streaked with gray and yellowish-red, fine sandy clay.

60 inches +, similar-colored fine sandy clay which shows slight stratification.

Results of mechanical analyses of samples of Craven and Lenoir very fine sandy loams are given in table 5.

TABLE 5.—*Mechanical analyses of two soils from Pamlico County, N. C.*

Soil type and sample no.	Depth	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
Craven very fine sandy loam:	*Inches*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
239203	0- 4	0.0	0.2	0.4	5.8	56.4	26.5	10.7
239204	4-10	.1	.2	.3	5.9	53.1	26.9	13.6
239205	10-26	.2	.4	.3	3.9	30.4	17.4	47.4
239206	26-40+	.0	.1	.4	7.4	28.6	18.4	45.0
Lenoir very fine sandy loam:								
239207	0- 5	.0	.2	.2	1.3	40.0	44.5	13.8
239208	5-11	.1	.1	.2	1.2	33.4	37.6	27.4
239209	11-40	.0	.1	.1	.7	23.7	28.4	47.0
239210	40+	.0	.1	.1	.8	32.5	19.1	47.4

Norfolk fine sand has developed from the deposition of a rather deep layer of fine sand over fine sandy clay.

The Dunbar soils differ from the Norfolk mainly in that they are slightly less well drained. The lower part of the B horizon is mottled and slightly heavier, and the material in the C horizon is heavier than that in the corresponding horizon of the Norfolk soil. The Moyock soils differ from the Norfolk and Dunbar in having slightly darker colored surface layers and in being more friable throughout the B horizon. They do not have a definite structure, as the material consists of a mealy friable mass.

The surface appearance of Craven very fine sandy loam resembles that of Norfolk fine sandy loam, but the Craven soil differs from the Norfolk in that it has a heavy slightly plastic clay B horizon, the upper part of which is uniformly yellow and the lower part mottled yellow, gray, and brown. The C horizon is heavy clay, similar to that under Lenoir very fine sandy loam.

The Lenoir and Bladen soils have developed from beds of heavy clays, under poor drainage. The main difference between these soils is that the B horizon of the Lenoir is heavy tough clay, whereas the B horizon of the Bladen is heavy plastic clay.

Owing to their high content of organic matter, the Bayboro, Portsmouth, and Hyde soils are black. The Portsmouth soils differ from the Bayboro soil in having a mottled friable sandy clay B horizon, whereas the B horizon under the Bayboro soils is steel-gray, mottled and streaked with yellow, heavy plastic clay similar to the corresponding horizon in the Bladen profile. The Hyde soils differ from the Bayboro and Portsmouth soils in that the black color continues to a depth of several feet.

Leon fine sand and St. Johns fine sand are characterized by a black or dark-brown hardpan layer consisting of fine sand cemented with organic matter. Leon fine sand has grayish-white fine sand overlying the hardpan, whereas St. Johns fine sand has black mucky fine sand.

Large areas of organic soils are mapped as Pamlico muck which consists of fairly well decomposed organic matter, together with a small amount of mineral matter. The rather extensive areas of tidal marsh and swamp and small areas of coastal beach and made land are unimportant as regards soil development.

SUMMARY

Since early settlement, Pamlico County has been a rural community depending largely on agriculture for its main sources of income. The relative importance of the different agricultural products has varied, owing to improved methods of transportation, markets, and other factors. The county comprises a low-lying peninsula about midway along the eastern coast line of the State. The elevation over approximately one-third of the county ranges from 2 to 9 feet. The relief is dominantly flat, with a slight gradient toward the main bodies of water. Natural drainage over the greater part of the county is poor, and artificial drainage has been established to reclaim most of the land devoted to agriculture. The mild climate is due, in part, to the modifying effect of the nearby bodies of water. Because of the mild climate, temperature, and abundant rainfall, many different crops are grown, and the factor limiting the production of crops is the soil.

Probably not more than 15 percent of the land area of this county is cultivated or in pasture. The proportion of light-colored well-drained soils is small. The Norfolk and Craven soils of this group are well suited to cotton, tobacco, sweetpotatoes, peanuts, and early truck crops, and they are used largely for the production of bright tobacco and cotton. Associated with these soils is Moyock fine sandy loam which is well adapted to the production of leafy vegetables, particularly spinach and kale.

Bayboro loam, Portsmouth loam, Portsmouth fine sandy loam, and Portsmouth fine sandy loam, sandy-subsoil phase, are the best soils for the production of potatoes, and Hyde loam is considered an excellent soil for corn. These black soils have long been regarded as the best soils in eastern North Carolina for corn, soybeans, potatoes, and cabbage. Bladen fine sandy loam also is a good soil for the production of potatoes.

Under present economic conditions, the best use for the large areas of Pamlico muck, Portsmouth loam, swamp phase, tidal marsh, swamp, St. Johns fine sand, and Leon fine sand is for the production of timber and scant pasturage.

There are large areas of inherently good soil in the county that could be artificially drained and reclaimed for agricultural purposes. There are also areas which lie at such low elevations that drainage is not feasible under present conditions.

O

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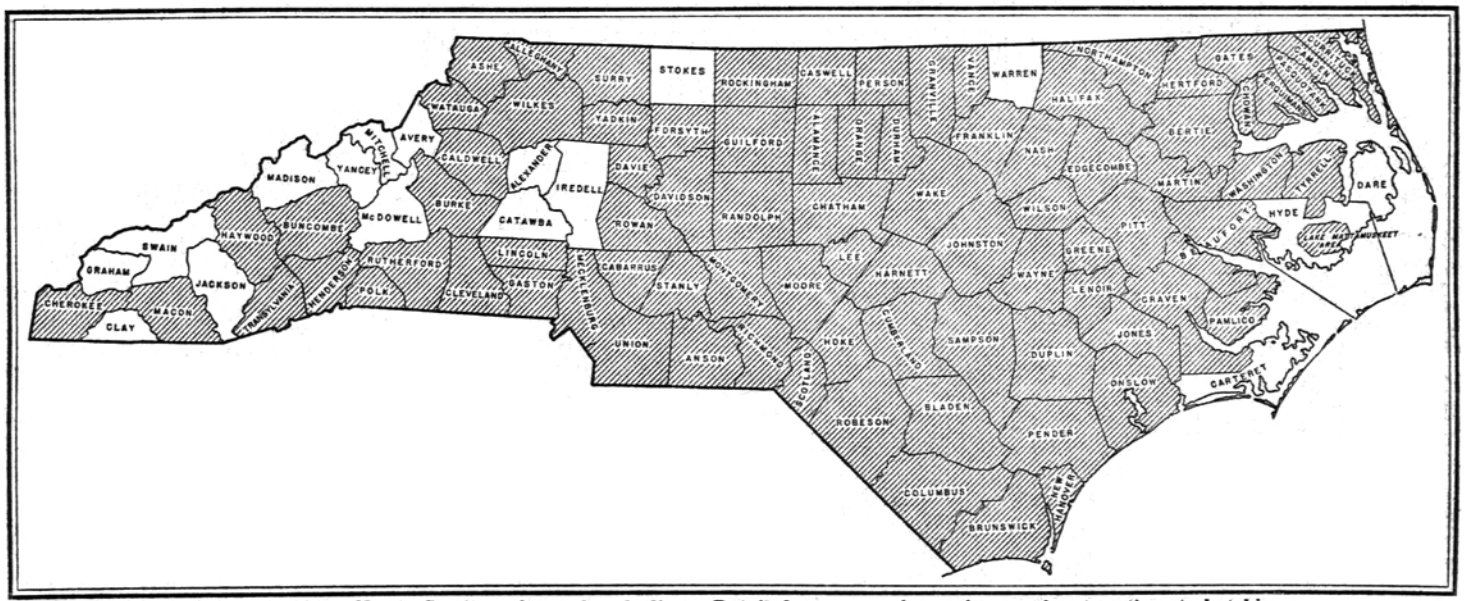
There shall be printed, as soon as the manuscript can be prepared with the necessary maps and illustrations to accompany it, a report on each soil area surveyed by the Bureau of Chemistry and Soils, Department of Agriculture, in the form of advance sheets bound in paper covers, of which not more than two hundred and fifty copies shall be for the use of each Senator from the State and not more than one thousand copies for the use of each Representative for the congressional district or districts in which a survey is made, the actual number to be determined on inquiry by the Secretary of Agriculture made to the aforesaid Senators and Representatives, and as many copies for the use of the Department of Agriculture as in the judgment of the Secretary of Agriculture are deemed necessary.



Areas surveyed in North Carolina shown by shading. Detailed surveys shown by northeast-southwest hatching.

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