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Soil Survey

of

Jones County, North Carolina

By

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North Carolina Agricultural Experiment Station, in Charge

and

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United States Department of Agriculture

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 JONES COUNTY, NORTH CAROLINA

By W. A. DAVIS, North Carolina Department of Agriculture and North Carolina Agricultural Experiment Station, in Charge, and K. V. GOODMAN and Z. C. FOSTER, United States Department of Agriculture

COUNTY SURVEYED

Jones County is in the eastern part of North Carolina (fig. 1). Trenton, the county seat, is about 100 miles southeast of Raleigh, the State capital, and 20 miles southwest of New Bern. The total area of the county is 469 square miles, or 300,160 acres.

In general the relief is level, undulating, and gently rolling. The larger and more conspicuous level areas are in the northern, southern, and eastern parts of the county and are a part of Great Dover Swamp, Whiteoak Pocosin, and Lakes Pocosin. Smaller flat areas occur throughout the county. The gently rolling and rolling areas are along Trent River, Whiteoak River, and the larger streams throughout the county. The large areas of Pamlico muck developed in the pocosins (swamps) lie at higher elevations than the surrounding mineral soils.

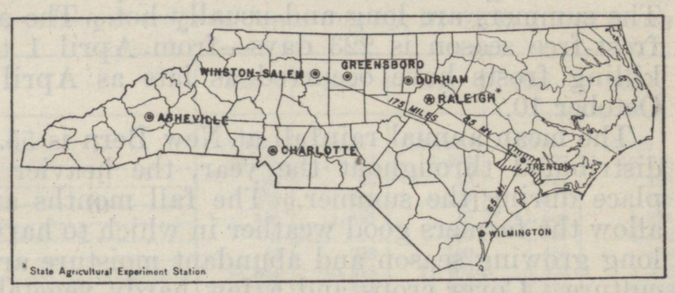


FIGURE 1.—Sketch map showing location of Jones County, N. C.

Trent River and Whiteoak River, together with their several tributaries, constitute the main drainage system. The greater part of the rolling land has fairly good surface drainage, but practically all the level areas require artificial drainage, which in many places is accomplished by open ditches. All the drainage from the pocosins is outward, and many streams head in them.

According to the United States Geological Survey, the elevation above sea level at Trenton is 29 feet, at Comfort 51 feet, and at Polloksville 28 feet. The general slope of the land is to the east and southeast. The highest part of the county is along the western border and in the southwest corner, and the lowest is in the southeast corner along Whiteoak River.

Jones County was formed in 1779 from Craven County. The early settlers were Swiss, Germans, and English. The 1930 census reports 10,428 inhabitants, all classed as rural. The average density of the population is 25 persons a square mile, and settlement is fairly well distributed except on the larger flat poorly drained areas. There are no large towns or cities. Trenton, the county seat, has a population of 500. Other towns are Polloksville, with 357 people; Maysville, with 797; and Comfort, with 400. These afford local markets for the agricultural products of the county. The principal outside markets are Kinston, New Bern, Greenville, and Wilson.

Lines of the Atlantic & Carolina and the Atlantic Coast Line Railroads operate in the county, and there are two United States Highways (Nos. 258 and 17). Most of the county roads and private

roads are good in dry weather, but in rainy weather and during the winter they are almost impassable in many places. Rural mail delivery reaches most parts, and churches and schoolhouses are conveniently located. Well water is available at a depth of about 20 feet, and artesian water is obtained at a depth of 125 feet.

The only nonagricultural industry in Jones County is lumbering, which is carried on in a number of sawmills that cut lumber, barrel staves, material for vegetable crates, and cross ties.

CLIMATE

The climate is oceanic; that is, it is affected by the proximity of the Atlantic Ocean. The winters, as a rule, are mild ,but several days occur during this season when the temperature stays below freezing. The summers are long and usually hot. The average length of the frost-free season is 223 days—from April 1 to November 10—but killing frosts have occurred as late as April 25 and as early as October 10.

The mean annual rainfall at New Bern is 55.89 inches. It is well distributed throughout the year, the heavier precipitation taking place during the summer. The fall months are sufficiently dry to allow the farmers good weather in which to harvest their crops. The long growing season and abundant moisture are favorable for agriculture. Cover crops and a few hardy vegetables, such as turnips, kale, spinach, and broccoli, can be grown throughout the winter, and cabbage can be grown during the latter part of the winter and early spring. Farm labor can be carried on the greater part of the year.

Table 1 gives the normal monthly, seasonal, and annual temperature and precipitation as recorded at the United States Weather Bureau station at New Bern, in Craven County, north of Jones County. This data is fairly representative of conditions in Jones 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

Agriculture began in Jones County more than 200 years ago. At first it was carried on exclusively on land along Trent River, and it still is largely confined to the better drained soils. The early agriculture consisted of the production of wheat, oats, rice, rye, corn, peas, and cotton, together with the raising of cattle, sheep, and hogs.

According to the 1880 Federal census, the leading crops, in respect to acreage, were corn, cotton, oats, sweetpotatoes, wheat, and rice.

Table 2, compiled from the Federal census, gives the acreage of the principal crops for the census years 1899 to 1934, inclusive.

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

Crop	1899	1909	1919	1929	1934
	Acres	Acres	Acres	Acres	Acres
Corn	19,888	18,182	15,496	16,027	19,563
Potatoes	61	49	47	121	155
Sweetpotatoes	333	601	229	311	296
Peanuts	455	1,524	19	1,565	1,814
Dry edible beans	8	----------	619	1,397	3,572
Dry peas	84	238	109	456	409
Cotton	11,524	10,318	11,102	5,493	3,376
Tobacco	513	1,304	5,272	7,370	6,140
Hay and forage	500	1,833	4,501	3,234	5,477
	Trees	Trees	Trees	Trees	Trees
Apples	2,858	6,094	2,936	3,558	1,535
Peaches	2,063	7,067	3,143	3,754	1,827

Table 2 indicates that the corn acreage has remained fairly constant since 1899, but that the cotton acreage in 1929 was about one-half that in 1919. This decrease in acreage was due to infestation by the boll weevil and to the low price of cotton. The acreage devoted to peanuts in 1929 shows a decided increase over the acreage in 1919. Tobacco has proved successful, and in 1929 the acreage devoted to this crop was 7,370 acres, as compared to 513 in 1899. The acreage in small grain in 1929 was practically negligible. The total value of all agricultural products in 1929 was $2,017,873.

According to the 1935 Federal census, the number of cattle in this county more than doubled in the period 1930–35. The number of hogs gained was approximately 1,300. Horses were 151 fewer in the latter year.

More corn and hay crops were grown in 1934 than in 1929. Corn increased 3,536 acres and hay 2,240 acres, but tobacco was harvested from 1,230 fewer acres. In 1934 crops were harvested from 36,276 acres, which included 19,563 of corn, 6,140 of tobacco, 5,477 of hay, and a few acres devoted to minor crops. Average yields of corn have increased from slightly more than 11 bushels an acre in 1909 to more than 16 bushels in later years.

The number of farms increased 64 and the land in farms nearly 23,000 acres between 1930 and 1935. The average acreage a farm was 84.9 acres in 1935 as compared with 73.7 in 1930. The value of farm land decreased to $21.92 an acre in 1935, or $11.22 below the value reported 5 years earlier.

Commercial fertilizer is used on nearly all the cultivated land; most of the fertilizer is bought ready mixed. According to the Federal census, $216,204 was spent for fertilizer (including lime) in 1929. The grades in general use are 3–8–3,[1] 3–8–5, 4–8–6, and 5–7–5.

Labor is plentiful and includes both white and colored workers. The price paid for help is $1 a day without board or $15 a month with board.

The farms range in size from a few acres to several hundred. The average size in 1929 was 73.7 acres, of which 28.6 acres was improved land.

According to the Federal census of 1935, 30.9 percent of the farms are operated by owners, 69.0 percent by tenants, and 0.1 percent by managers. Under the prevailing share-rental system, when the landlord furnishes one-half of the fertilizer, the teams, plows, and seed, he receives one-half of the crop, and when he furnishes one-third of the fertilizer and seed he receives one-third of the crop.

The farmhouses are amply large and substantial, but many of the tenant houses are small. The ordinary farm equipment consists of one-horse turning plows, two-horse turning plows, spike-tooth harrows, fertilizer-distribution cultivators, cotton and corn planters, stalk cutters, disk harrows, and hayrakes. A few farmers have tobacco transplanters, soybean harvesters, manure spreaders, and riding plows. The work animals are horses and mules; most of the hogs are Duroc-Jersey and Hampshire; and the milk cows are mainly of the Jersey and Guernsey breeds.

SOIL-SURVEY METHODS AND DEFINITIONS

Soil surveying consists of the examination, classification, and mapping of soils in the field.

The soils are examined systematically in many locations. Test pits are dug, borings are made, and exposures such as those in road or railroad cuts, are studied. Each excavation exposes a series of distinct soil layers, or horizons, called collectively the soil profile. Each horizon of the soil, as well as the parent material beneath the soil, is studied in detail; and the color, structure, porosity, consistence, texture, and content of organic matter, roots, gravel, and stone are noted. The reaction of the soil [2] and its content of lime and salts are determined by simple tests. The drainage, both internal and external, and other external features, such as the relief or lay of the land, are taken into consideration, and the interrelation of soils and vegetation are studied.

The soils are classified according to their characteristics, both internal and external, special emphasis being given to those features influencing the adaptation of the land for the growing of crop plants, grasses, and trees. On the basis of these characteristics soils are grouped into mapping units. The three principal ones are: (1) Series, (2) type, and (3) phase. There are areas of land, such as swamp and muck, which are not true soils; and these are called (4) miscellaneous land types.

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

[2] The reaction of the soil is its degree of acidity or alkalinity expressed mathematically as the pH value. A pH value of 7 indicates precise neutrality, higher values alkalinity, and lower values acidity.

The most important of these groups is the series which includes soils having the same genetic horizons, similar in their important characteristics and arrangement in the soil profile, and developed from a particular type of parent material. Thus the series includes soils having essentially the same color, structure, and other important internal characteristics and the same natural drainage conditions and range in relief. The texture of the upper part of the soil, including that commonly plowed, may vary within a series. The soil series are given names of places or geographic features near which they were first found. Thus Norfolk, Hagerstown, Barnes, Miami, Houston, and Mohave are names of important soil series.

Within a soil series are one or more soil types, defined according to the texture of the upper part of the soil. Thus the class name of the soil texture, such as sand, loamy sand, sandy loam, loam, silt loam, clay loam, silty clay loam, and clay, is added to the series name to give the complete name of the soil type. For example, Norfolk fine sandy loam and Norfolk fine sand are soil types within the Norfolk series. Except for the texture of the surface soil, these soil types have approximately the same internal and external characteristics. The soil type is the principal unit of mapping and because of its specific character is generally the soil unit to which agronomic data are definitely related.

A phase of a soil type is a subgroup of soils within the type, which differ from the type in some minor soil characteristic that may, nevertheless, have important practical significance. Differences in relief, stoniness, and the degree of accelerated erosion are frequently shown as phases. For example, within the normal range of relief for a soil type there may be parts which are adapted to the use of machinery and the growth of cultivated crops and other parts which are not. Even though there may be no important differences in the soil itself or in its capability for the growth of native vegetation throughout the range in relief, there may be important differences in respect to the growth of cultivated crops. In such an instance the more sloping parts of the soil type may be segregated on the map as a sloping or hilly phase. Similarly, soils having differences in stoniness may be mapped as phases even though these differences are not reflected in the character of the soil or in the growth of native plants.

The soil surveyor makes a map of the county or area, showing the location of each of the soil types, phases, and miscellaneous land types, in relation to roads, houses, streams, lakes, section and township lines, and other cultural and natural features of the landscape.

SOILS AND CROPS

According to the census of 1935 about 17 percent of the total land area in Jones County was used for farming purposes, with 13.6 percent actually harvested for crops, the rest consisting principally of cut-over land, as practically all of the original merchantable timber has been cut and sold. The second growth on all the soils, except

Portsmouth fine sand and Pamlico muck, gives promise of making a fair quality of soft timber within the next few years.

The present-day agriculture consists principally of the production of corn, cotton, and tobacco, although some hay and forage crops, sweetpotatoes, potatoes,[3] peanuts, soybeans, and garden vegetables are grown. A few cattle and hogs are raised.

Bright-leaf tobacco and cotton are the main cash crops, and they have been grown in this county for a long time. The farmers know how to handle these crops under various soil and climatic conditions. These crops have brought the greatest cash return an acre of the crops that can be grown here. Under normal conditions, fair profits are obtained. The census of 1935 shows that 6,140 acres were planted to tobacco in 1934, producing 5,515,853 pounds. Cotton, according to the census of 1929, was planted on 5,493 acres and produced 1,541 bales. The acreage in cotton in 1934 was considerably less, due to the restriction of the acreage of that crop.

Corn, the most widely distributed crop, covers the largest acreage. In 1934 there were 19,563 acres in corn, yielding 320,523 bushels. Corn is grown mainly as a subsistence crop and is used for feeding work animals and fattening hogs, and some is ground into meal for use in the home. Hay and forage crops were grown on 5,477 acres, and 4,034 tons of hay were produced.

Some soybeans are grown for seed, and some are cut for hay. A rather large acreage is devoted to peanuts, some of which are harvested, and some hogged off, that is, the hogs are turned into the peanut fields for fattening. A few potatoes, cucumbers, and cabbage are grown on a commercial scale and sold for cash. Sweetpotatoes and garden vegetables, some fruits, and Scuppernong grapes are produced for home use. In 1935 there were 11,661 hogs and pigs in the county, and considerable revenue is derived from the sale of hogs.

The soils of this county differ widely in color, texture, structure, and drainage conditions, and in their chemical composition and content of organic matter. The texture of the surface soils is dominantly fine—mainly fine sandy loam, very fine sandy loam, or loam. The better drained and generally the lighter textured soils are near the streams, whereas the flatter and more poorly drained lands are on the alluvial flats or bottom lands or in the broad interstream areas. The main differences in many of these soils have been caused by differences in drainage and aeration and, in large measure, by the character of the underlying material.

Considered agriculturally, on the bases of drainage conditions and color, the soils of Jones County may be placed 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 nonagricultural soils and land types.

In the following pages, the soils are described in detail, and their agricultural relationships are discussed; the accompanying soil map shows their location and distribution; and table 3 gives their acreage and proportionate extent.

[3] As used in this report the term potatoes refers to Irish, or white, potatoes, not to sweetpotatoes.

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

Soil type	Acres	Percent	Soil type	Acres	Percent
Norfolk fine sandy loam	16,832	5.6	Bayboro loam	19,136	6.4
Norfolk fine sandy loam, deep phase	6,272	2.1	Portsmouth loam	9,024	3.0
Norfolk fine sand	21,696	7.2	Portsmouth fine sandy loam	70,144	23.4
Craven very fine sandy loam	37,888	12.6	Leon sand	7,936	2.6
Dunbar fine sandy loam	5,632	1.9	Portsmouth fine sand	4,160	1.4
Kalmia fine sand	1,984	.7	Pamlico muck	50,496	16.8
Onslow fine sandy loam	15,680	5.2	Swamp	15,552	5.2
Lenoir very fine sandy loam	15,296	5.1	Total	300,160	
Bladen very fine sandy loam	2,432	.8			

LIGHT-COLORED WELL-DRAINED SOILS

The group of light-colored well-drained soils includes all the soils of the Norfolk, Craven, Kalmia, and Dunbar series mapped in this county. The total acreage of these is 90,304 acres, or 30.1 percent of the total area of the county. Although they occupy a comparatively small acreage, they are recognized as the best developed soils in the county. Practically all of these soils are or have been cultivated. At present (1934) about 75 percent of them is under cultivation. The second-growth forest consists mainly of shortleaf pine, a few oaks, dogwoods, and maple, with an undergrowth of myrtle and briers.

The geographic position of these soils is well marked, as they occur on the breaks of the streams and on the gently rolling and undulating areas. These soils are by far the best drained soils in the county. The Dunbar soil is not so well drained as the Norfolk, Craven, and Kalmia soils but is better drained than any soil in the poorly drained groups. All the soils of this group, because of their favorable relief, are suitable for agriculture and lend themselves admirably to the use of all kinds of farm machinery.

All these soils have light-gray, grayish-yellow, or light-brown surface soils ranging in texture from fine sand to very fine sandy loam. The subsoils of the Norfolk and Kalmia soils range from yellow fine sand to yellow friable fine sandy clay. The subsoil of the Craven soils is yellow and much heavier than that of the Norfolk. The subsoil of the Dunbar is mottled yellow and gray fine sandy clay. The subsoils, however, are sufficiently friable to retain a large proportion of the rainfall, thus maintaining good moisture conditions for growing plants.

The light color of the surface soils indicates a low content of organic matter. These soils are leached of most of the soluble plant nutrients, but their physical properties are so favorable that they respond readily to fertilization. Because of the sandy texture of the surface soils and the porosity and friability of the subsoils, these soils warm early in the spring and are the first in the county on which agricultural operations begin. All these soils are acid where lime has not been applied recently.

Practically all of the tobacco, most of the cotton and sweetpotatoes, and a large part of the corn are produced on these soils. Tobacco is grown largely on Norfolk fine sandy loam, its deep phase,

and the Craven soils, because they are easily worked, well drained, and produce a bright-leaf tobacco.

Norfolk fine sandy loam.—The 4- to 6-inch surface soil of Norfolk fine sandy loam in cultivated fields is light-gray or grayish-yellow loamy fine sand which grades into pale-yellow loamy fine sand or light fine sandy loam, that extends to a depth ranging from 12 to 15 inches. The subsoil is yellow friable crumbly fine sandy clay to a depth ranging from 30 to 36 inches, where it is underlain by mottled yellow, light-gray, and red fine sandy clay. The subsoil in some of the flatter areas, where drainage is not well established, shows some mottlings of light gray at a depth of 25 or 28 inches.

Included with mapped areas of Norfolk fine sandy loam are small bodies of Norfolk fine sand and of Norfolk fine sandy loam, deep phase. Bordering areas of Craven very fine sandy loam, the subsoil is heavy in texture and structure.

Norfolk fine sandy loam covers an area of 16,832 acres, mainly in the northwestern and southwestern parts of the county. The largest areas are in the vicinity of Sassers Mill, in the point of the county west of Dover, and in the southwestern part in the vicinity of Hargetts Store, Tuckahoe School, and near Comfort. Smaller areas are mapped along the Lenoir County line in the vicinity of Pleasant Hill, and in the southern part of the county near Whiteoak River and near Hunters Creek.

This soil occupies interstream areas or broad ridge crests having almost level, undulating, or gently sloping relief. The part bordering the small streams is the more sloping. Practically all of this soil is naturally well drained, although a few shallow ditches are necessary to carry off the excess rain water from the more level areas, especially those which have not been invaded by natural drainageways.

Nearly all of the land is cleared and under cultivation, and the rest is forested to longleaf and shortleaf pines, a few oaks, dogwood, sweetgum, myrtle, and holly.

The chief crops grown are corn, tobacco, cotton, peanuts, sweetpotatoes, soybeans, tomatoes, cucumbers, and garden vegetables. About 35 percent of this soil is devoted to the production of corn, 30 percent to tobacco, 30 percent to cotton, and the remaining 5 percent to the other crops mentioned. It is the best soil in the county for the production of bright-leaf tobacco, cotton, sweetpotatoes, and peanuts. Tobacco yields from 500 to 900 pounds an acre when the soil is given 750 to 1,000 pounds of a 3–8–3, 3–8–5, or 4–8–6 fertilizer. Cotton yields from one-fourth to 1 bale an acre when fertilized with from 300 to 500 pounds of 3–8–3 and given a side dressing of 50 to 100 pounds of nitrate of soda. Corn yields from 15 to 30 bushels an acre and is usually fertilized with 200 pounds of 3–8–3 and a side application ranging from 100 to 150 pounds of nitrate of soda when the corn is about 2 feet high. Peanuts do well and are only lightly fertilized. Sweetpotatoes yield from 80 to 250 bushels an acre and are given a heavy application of high-grade fertilizer. When barnyard manure is applied to the soil, a smaller quantity of fertilizer is required.

Norfolk fine sandy loam is a mellow easily tilled soil, which warms quickly in the spring and responds readily to the application of commercial fertilizers, manures, and green cover crops. This soil can be improved greatly by the turning under of leguminous crops or by the addition of barnyard manure and thus built up to a fair state of productivity. A small amount of lime is beneficial for the production of certain crops. This is one of the most desirable soils in the county for the production of the cash crops, early truck, and garden vegetables.

Norfolk fine sandy loam, deep phase.—Norfolk fine sandy loam, deep phase, differs from typical Norfolk fine sandy loam in that the surface layer and subsurface layer in most places are lighter in texture and looser in structure and in that the friable fine sandy clay subsoil lies at a depth ranging from 20 to 30 or more inches below the surface. Included with this deep soil are a few areas of Norfolk fine sand and small areas of Norfolk fine sandy loam.

The deep phase of Norfolk fine sandy loam in most places is closely associated with Norfolk fine sandy loam and Norfolk fine sand. Some of the larger areas are developed southeast of Phillips Crossroads, west and south of Polloksville, near Maysville, and in the extreme northeastern part of the county near Whitford, and smaller areas are in the extreme southwestern part west of Hargetts Store and along the Lenoir County line.

This deep soil has almost level, undulating, gently sloping, and in some places, gently rolling relief. It is more rolling than typical Norfolk fine sandy loam. It is admirably well drained, owing to the favorable relief combined with the sandy texture and open structure throughout the profile.

A large proportion of this land is under cultivation, and the rest is forested with pines, together with sweetgum, dogwood, and scrub oaks. A few abandoned fields are in broomsedge and briers. This deep soil is used for practically the same crops and is fertilized in a similar manner as Norfolk fine sandy loam, but crop yields are less unless the soil has been heavily fertilized and considerable organic matter in the form of green-manure crops has been added. Because of the deep loamy fine sand over the fine sandy clay, this soil is difficult to build up and maintain in the same state of productivity as Norfolk fine sandy loam. This is a better soil than Norfolk fine sand or Kalmia fine sand but is not so good as Norfolk fine sandy loam. It is suited to the production of peanuts, asparagus, other early truck crops, and Scuppernong grapes. It produces a good quality of bright-leaf tobacco. The recommendations suggested for the improvement of Norfolk fine sandy loam apply also to this soil.

Norfolk fine sand.—Norfolk fine sand is the lightest textured and the most open and porous soil of the Norfolk series in Jones County. As the light color indicates, it is deficient in organic matter and also in mineral plant nutrients. It warms early in the spring and is very easily tilled. Light farming implements are all that are necessary for the plowing and cultivation of this soil.

The surface soil under field conditions is light-gray or grayish-yellow fine sand to a depth of 5 or 6 inches, where it is underlain by yellow or pale-yellow loose fine sand which continues to a depth ranging from 36 to 50 or more inches. Below this the material grades into grayish-yellow or brownish-yellow loamy fine sand—in

some places into mottled light-gray, yellow, and brown fine sandy clay. In wooded areas the upper 1 to 3 inches of the surface soil contains a slight accumulation of organic matter. In a few places the surface soil is light-brown fine sand underlain by brownish-yellow fine sand which resembles Ruston fine sand. A few small areas of Norfolk sand also are included.

Norfolk fine sand occupies a large acreage. It occupies broad almost continuous areas on both sides of Trent River. Smaller bodies lie along Tuckahoe Swamp and some of the tributaries. A few small areas are mapped along Whiteoak River.

This soil has level, undulating, or gently sloping relief. It is especially well drained and can be cultivated almost immediately following ordinary rains.

Probably about 50 percent of the land is under cultivation, and the remainder supports a growth of old-field pine, together with some sweetgum, dogwood, and scrub oak. In recent years broomsedge and a scattered growth of young pine have grown up on some areas. Corn is the principal crop, and some cotton and tobacco are grown. Yields of these crops are extremely low unless the land is heavily fertilized. The best yields of corn are obtained in places where a cover crop has been turned under and the soil given a heavy application of commercial fertilizer. Norfolk fine sand can be used for growing early truck crops, sweetpotatoes, blackberries, dewberries, and Scuppernong grapes. A large part of the land should be devoted to forestry.

Craven very fine sandy loam.—Craven very fine sandy loam differs from Norfolk fine sandy loam mainly because of its heavy subsoil and poor internal drainage. The surface layer of Craven very fine sandy loam is light-gray or grayish-yellow very fine sandy loam to a depth of about 6 inches. It is underlain by pale-yellow heavy fine sandy loam which continues to a depth ranging from 9 to 12 inches. In wooded areas, the topmost 2 or 3 inches of the surface soil contains enough organic matter to produce a gray color. The subsoil, to a depth ranging from 18 to 24 inches, is yellow or pale-yellow heavy tough clay. Beneath this and continuing to a depth of 40 or more inches is heavy tough slightly plastic clay mottled with light gray, brown, and some reddish yellow. At a depth of about 60 inches the material is steel-gray stiff plastic clay with purplish-red mottlings.

Included with mapped areas of this soil are small bodies of Craven fine sandy loam and Lenoir fine sandy loam. In some places, particularly on the more sloping areas where run-off is rapid, sheet erosion has been active, the surface soil is very shallow, and in places it has been washed away and the heavy clay exposed.

Craven very fine sandy loam occurs in close association with the Norfolk and Lenoir soils. It is one of the extensive and important soils of the county, totaling 37,888 acres, and it has a wide distribution. The largest areas are developed between Polloksville and Whitford, in the vicinity of Oliver Crossroads, around and northwest of Oak Grove, in the vicinity of Trenton, north of Phillips Crossroads, around the headwaters of Rattlesnake Branch, and northeast of Pleasant Hill, and smaller areas lie northeast of Comfort and west and northwest of Maysville.

This soil is developed mainly on the breaks and gentle slopes bordering the largest streams or the bottom lands and terraces. The relief ranges from almost level or undulating to sloping. Sheet erosion is worse on this soil than on any other soil in the county, owing to the fact that the surface covering of very fine sandy loam is normally shallow in many places and also to the fact that the heavy subsoil retards the passage of rain water. This soil does not drain out or warm so readily as does Norfolk very fine sandy loam.

Craven very fine sandy loam is an important agricultural soil in this county, and a large proportion of it is under cultivation. The forested areas are cut over for the most part, and the tree growth consists of pine, oak, some dogwood, and holly.

The principal crops grown are cotton, tobacco, corn, soybeans, peanuts, and the usual variety of garden vegetables. Corn yields from 20 to 30 bushels an acre with an application ranging from 200 to 300 pounds of 8–3–3 fertilizer. Cotton yields from one-half to three-fourths bale when the usual fertilizer (300 to 500 pounds of 3–8–3) has been applied. Tobacco gives good yields on this soil, ranging from 600 to 1,000 pounds. It is fertilized with from 700 to 1,000 pounds of 3–8–3 or 4–8–4. Soybeans do well for seed or hay. Peanuts are fertilized with 200 pounds of 0–8–2, together with some land plaster or lime. Austrian Winter peas and crimson clover can be grown successfully.

Dunbar fine sandy loam.—Dunbar fine sandy loam consists of light-gray or grayish-yellow loamy fine sand or light fine sandy loam to a depth of 4 or 6 inches. Beneath this and continuing to a depth of 12 or 15 inches is pale-yellow or grayish-yellow fine sandy loam or loamy fine sand. The subsoil is mottled yellow and gray rather heavy fine sandy clay which, at a depth of about 28 or 30 inches, is mottled with bright red. The fine sandy clay subsoil is much heavier in texture than the subsoil of Norfolk fine sandy loam but not so heavy as the subsoil of Craven very fine sandy loam. In wooded areas the upper 1 to 3 inches of the surface soil contains a small amount of organic matter, but this soon disappears with cultivation. Here and there, in the slight depressions the surface soil is gray fine sandy loam, and the subsoil is mottled yellow and gray heavy clay.

Dunbar fine sandy loam occurs in several scattered areas, mainly in the western part of the county. The two larger are west of Phillips Crossroads and east of Comfort, respectively. The most common occurrences of this soil are between areas of the Norfolk and Portsmouth soils or the Craven and Portsmouth soils. Its relief is smooth, and the soil occupies an intermediate topographic position between the well-drained Norfolk and Craven soils and the poorly drained dark-colored soils. The relief is flatter than that of the Norfolk soils, and drainage is not so good as on Norfolk fine sandy loam. Open ditches are necessary for the reclamation of this soil for agriculture.

Dunbar fine sandy loam is considered a fair agricultural soil, and from 50 to 60 percent of it is under cultivation. The forest growth on the rest consists of longleaf and shortleaf pines, together with a few oaks, sweetgum, dogwood, and holly. The main crops grown are corn, cotton, soybeans, and some tobacco. Corn, fertilized with 200 pounds of 3–8–3 and given a side dressing of 75 pounds of nitrate of soda, yields from 25 to 30 bushels an acre. Cotton yields one-fourth

to three-fourths of a bale when fertilized with 400 pounds of 3–8–3 and a side dressing of nitrate of soda. Tobacco yields from 500 to 800 pounds when an application of 700 to 1,000 pounds of 3–8–3 or 4–8–4 fertilizer is made. This soil can be used for the production of truck crops and is well suited to growing strawberries. As it is not so well drained as Norfolk fine sandy loam, it does not warm so early in the spring.

Kalmia fine sand.—Several fair-sized areas of Kalmia fine sand occur on the second bottoms, or terraces, along Trent River and Tuckahoe Swamp. The largest are developed east of Trenton, in the vicinity of Perry Bridge, and about 3 miles northeast of the bridge. The relief is undulating or gently rolling. Natural drainage of both surface soil and subsoil is good.

To a depth of 3 or 5 inches, Kalmia fine sand is gray, grayish-yellow, or, in places, light-brown fine sand. This is underlain by pale-yellow or grayish-yellow loose fine sand which extends to a depth ranging from 30 to 35 inches. Beneath this is yellow, slightly reddish yellow, or brownish-yellow loamy fine sand or mottled yellow, gray, and brown fine sandy clay. Included with mapped areas of this soil are small bodies of Kalmia fine sandy loam, in which the yellow friable fine sandy clay lies at a depth of about 20 inches. The soil in such areas is more productive than is Kalmia fine sand. In a few places there are small areas of Kalmia sand.

The relief, in general, ranges from level to undulating, and there are a few low ridges and some intervening swales. Natural surface drainage is good over the greater part of this soil. Part or all of the land is subject to overflow during periods of extremely high water.

From 40 to 50 percent of Kalmia fine sandy loam is under cultivation, and the remainder supports a growth of pine, together with scattered oaks, sweetgum, and dogwood. Some abandoned fields support a scattered growth of young pine and are covered with broomsedge and briers. The main cultivated crops are corn and cotton, and a few areas are devoted to the production of tobacco. Crop yields are low unless the soils are heavily fertilized and unless a large amount of organic matter has been added. The soil warms early in the spring and responds to the turning under of leguminous crops and to heavy fertilization. It is well suited to the production of watermelons, sweetpotatoes, and early truck crops. Most of Kalmia fine sand, however, should be used for forestry.

LIGHT-COLORED POORLY DRAINED SOILS

The light-colored poorly drained soils comprise 33,408 acres, or 11.1 percent of the county. This group includes Lenoir very fine sandy loam, Onslow fine sandy loam, and Bladen very fine sandy loam. These soils, for the most part, lie on broad smooth nearly level areas and occupy the next topographic belt inward from the Norfolk and Craven soils. Some of the Lenoir and Onslow soils occupy undulating or gently rolling areas. All these soils are benefited by artificial drainage, which in many places is accomplished by open ditches. The poor internal drainage of the Bladen and Lenoir soils is caused by the heavy character of the subsoil and by a comparatively high water table.

The surface soils of these soils range from light gray to dark gray and contain only a small amount of organic matter. With the exception of the Onslow soils, the subsoils are heavy tough more or less mottled plastic clays. The mottled condition indicates lack of aeration and only partial oxidation of the iron salts in the heavy clay subsoil. All these soils are acid. The soils of this group do not warm so early in the spring as the light-colored well-drained soils and cannot be cultivated quite so soon after a rain as the well-drained soils.

Onslow fine sandy loam.—The 4- to 6-inch surface soil of Onslow fine sandy loam is gray or dark-gray fine sandy loam or loamy fine sand. It is underlain by a ½- to 4-inch layer of brown or dark-brown so-called hardpan consisting of fine sand or fine sandy loam cemented by organic matter. The subsoil, which continues to a depth ranging from 25 to 30 inches, is pale-yellow friable or heavy fine sandy clay having a greenish cast. Below this is mottled light-gray and brownish-yellow friable clay or fine sandy clay. In places where this soil adjoins Lenoir very fine sandy loam the subsoil is heavier, and where it borders Norfolk fine sandy loam it is lighter in texture than the typical subsoil.

There is no uniformity in the thickness or compactness of the so-called hardpan, or brown, layer. The cementing material is dominantly organic matter, although in a few places there is some iron. In cultivated fields the brown layer has in many places been broken up with the plow, and small brown concretions or particles of hardpan are scattered over the surface and intermixed with the soil. In some areas of this soil no brown layer and concretions are present, but the color, texture, and structure of the subsoil and the underlying material are typical of the Onslow soils.

Onslow fine sandy loam is well distributed throughout the county. Some of the larger areas are south and southwest of Polloksville, south of Whitford, west and north of Trenton, southeast of Sassers Mill, in the vicinity of Comfort, east of Tuckahoe School, and around Hargetts Store, and many small areas are in the vicinity of Maysville and in the southeastern part of the county. Onslow fine sandy loam, as mapped in Jones County, in general occupies a position between Norfolk fine sandy loam and Portsmouth fine sandy loam, but some areas lie between Craven very fine sandy loam and the Portsmouth soils.

Onslow fine sandy loam has an undulating or nearly level relief, and natural drainage ranges from fair to poor. Open ditches are necessary for adequate drainage. This soil is not so well drained as Norfolk fine sandy loam, but it is better drained than Lenoir very fine sandy loam or Bladen very fine sandy loam.

About 40 percent of the land is under cultivation, and the remainder supports a forest growth of shortleaf and old-field pine, together with some sweetgum, dogwood, and scrub oak. The main crops are corn, soybeans, and cotton, and some of the soil is devoted to the production of tobacco and garden vegetables. Corn yields from 15 to 25 bushels an acre and is usually given an application ranging from 200 to 300 pounds of 3–8–3 fertilizer. By heavier applications of fertilizer and a side dressing of 75 to 100 pounds of nitrate of soda, larger yields can be obtained. Cotton yields range from one-

fourth to three-fourths bale an acre when fertilized with from 200 to 300 pounds of 3–8–3. A few farmers side-dress the cotton, using 75 to 100 pounds of nitrate of soda. Tobacco yields from 500 to 800 pounds an acre and is usually given an application of from 700 to 1,000 pounds of 3–8–3 or 4–8–4 fertilizer. This soil is well suited to the production of strawberries and garden vegetables.

Lenoir very fine sandy loam.—The 4- to 7-inch surface layer of Lenoir very fine sandy loam is light-gray or gray very fine sandy loam. It is underlain by yellow heavy very fine sandy loam or fine sandy clay mottled with gray, which extends to a depth of 8 or 10 inches and contains a high proportion of silt. The subsoil, which extends to a depth ranging from 30 to 38 inches, is light-gray heavy tough somewhat brittle clay mottled with yellow and reddish yellow. The material breaks up into irregular-shaped lumps and cracks on drying. Below this is very light-gray heavy clay or silty clay, mottled with yellow. In a few places this layer is present at a depth of 26 inches below the surface. Included with this soil in mapping are small areas in which the subsoil is drab heavy tough clay. A few areas of Lenoir fine sandy loam are mapped with the very fine sandy loam. In cultivated fields, in places where organic matter has not been supplied, the surface soil in general is light gray or grayish yellow when dry, but it has a somewhat brown cast when wet. The surface covering of very fine sandy loam over the heavy subsoil is thin in some places, especially where there has been some sheet erosion.

Lenoir very fine sandy loam occupies a slightly smaller acreage than Onslow fine sandy loam. It occurs in several large areas in the northeastern part of the county, east, north, and northwest of Polloksville. Large bodies are developed between Oliver Crossroads and Trenton, and small areas are in the central and southeastern parts of the county.

In relief this soil is generally intermediate between Craven very fine sandy loam on one side and the Portsmouth, Bladen, and Bayboro soils on the other. It is almost level, undulating, or very gently sloping. The more sloping areas are near the natural drainageways. Natural surface drainage is poor, and open ditches are necessary to drain the soil for agricultural use. After heavy rains, water remains on the ground in the flat areas, because it cannot easily penetrate the heavy subsoil.

About 15 or 20 percent of this soil is farmed, mainly for the production of corn, soybeans, cotton, and hay. The remainder is in forest consisting of loblolly and shortleaf pines, some oaks, sweetgum, maple, and, in places, an undergrowth of gallberry bushes. Corn yields from 15 to 25 bushels an acre and is usually fertilized with 200 pounds of 3–8–3. Some farmers apply 75 pounds of nitrate of soda an acre when the corn is about 24 inches high. Cotton yields from one-third to one-half bale an acre where from 300 to 400 pounds of 3–8–3 fertilizer have been added. A small acreage is devoted to tobacco. The tobacco is grown on the better drained and lighter textured parts of this soil. Soybeans do well, especially when fertilized.

Because of its very fine texture, this soil cannot be worked so easily as the Norfolk or Dunbar soils, and it has a tendency to bake and

clod. Organic matter, in the form of manure or green cover crops, would improve the structure and at the some time supply some of the needed nitrogen. This soil is acid, and for growing corn and soybeans liberal applications of lime are recommended.

Bladen very fine sandy loam.—The 3- to 5-inch surface layer of Bladen very fine sandy loam is gray, dark-gray, or grayish-brown mellow and friable very fine sandy loam. It is underlain to a depth ranging from 12 to 15 inches by light-gray very fine sandy loam slightly mottled with rust brown. The subsoil, to a depth of 40 or more inches, is steel-gray or light-gray heavy plastic clay or heavy plastic fine sandy clay, mottled or streaked with brownish yellow or ocherous yellow. Below this the texture and structure remain the same, but most of the mottlings disappear. In a few places the surface soil is silt loam, and here and there it has a fine sandy loam texture.

This soil occurs in several areas, scattered mainly throughout the western part of the county. The largest of these is about 4 miles west of Phillips Crossroads, and small bodies are in the vicinity of Comfort, northwest of Sassers Mill, and in the vicinity of Maysville.

The land is almost level or flat, surface drainage is poor, and open ditches are necessary to take off the surface water. Because of the heavy plastic character of the subsoil, internal drainage is slow. The walls of the ditches stand up well on account of the heavy character of the subsoil.

About one-half of this soil is under cultivation and is used mainly for the production of corn and soybeans. Corn yields from 25 to 40 bushels an acre and is usually given from 200 to 300 pounds of a 3–8–3 fertilizer an acre. Some farmers side-dress the corn when it is about 2 feet high with 75 pounds of nitrate of soda. Soybeans make good yields of beans and produce good hay for cattle. Most of the merchantable timber has been cut, leaving a scattered growth of pine and some hardwoods, with an undergrowth of broomsedge and wiregrass, which affords summer pasture for cattle.

Bladen very fine sandy loam is closely associated with Bayboro loam and Portsmouth loam. It is considered a strong soil, and, when drained, limed, and fertilized, will produce large yields of corn and soybeans. In some counties in eastern North Carolina, potatoes are grown on a rather large scale, and yields are satisfactory. Cabbage and other leafy vegetables do well.

BLACK POORLY DRAINED SOILS

Included in this group are Bayboro loam, Portsmouth fine sandy loam, and Portsmouth loam. These soils occupy level or slightly depressed areas, in which natural drainage has not been established. The most common characteristics of these soils are their black color and high content of organic matter, which are due to the accumulation of decayed vegetation for a long time when the land was in a swampy or semiswampy condition.

These soils are naturally strongly acid and for best results require heavy applications of lime for the production of corn and some other crops. These soils are well suited to the production of corn, soybeans, cabbage, potatoes, and leafy vegetables. Artificial drainage is necessary to reclaim these soils for agricultural use and such drainage, in

many places, can only be effective through district or community cooperation. The forest growth consists of sweetgum, loblolly and other pines, some blackgum, maple, water oak, and an undergrowth of gallberry, myrtle, and bay.

Bayboro loam.—Bayboro loam was mapped as Bladen loam in some of the earlier soil surveys in eastern North Carolina. It differs from the Bladen soils because of the black color of the surface soil. Bayboro loam, to a depth ranging from 5 to 18 inches, is black or very dark grayish-brown loam containing a large amount of well-decomposed organic matter. Underlying the black loam in most places is a 2- to 4-inch layer of light-gray loam or very fine sandy loam, faintly mottled with yellow or brown. The true subsoil is steel-gray heavy plastic tenacious clay or very fine sandy clay, streaked or splotched with brownish yellow or ocherous yellow. It continues downward for a depth of several feet, but generally below a depth of 40 inches the mottles disappear and the steel-gray color prevails. Included with Bayboro loam are small areas of Bladen very fine sandy loam and Portsmouth loam. Bayboro loam is mellow and friable and after a few years' cultivation assumes a dark grayish-brown or brownish-black color.

Bayboro loam is developed in several large areas, well distributed throughout the county. The largest are in the northeastern part along the Craven County line, northwest and southeast of Maysville, east of Polloksville, and west of Phillips Crossroads.

This soil is flat or almost level. The natural surface drainage is poor, and internal drainage is slow, owing to the imperviousness of the clay subsoil. Canals and open ditches are essential in the reclamation of this land for agricultural use. The banks of the canals and ditches stand up well, owing to the heavy clay subsoil.

On account of poor drainage, only a few small areas of Bayboro loam are farmed, and probably less than 2 percent of this soil is under cultivation. The rest supports a rather heavy growth of sweetgum, with some water oak and pine, and an undergrowth of myrtle and some gallberry. Reeds thrive on this soil, and these, together with other grasses, furnish some pasturage for cattle.

Corn and soybeans are the principal crops. Corn yields from 25 to 50 bushels an acre, depending on the amount of fertilizer applied. Most farmers apply from 200 to 400 pounds of 3–8–3 to the acre. Liming is beneficial for the production of corn and soybeans. This is inherently one of the strongest soils in Jones County and if drained and reclaimed would be well adapted to the growing of corn, soybeans, potatoes, and cabbage and other leafy vegetables.

Portsmouth loam.—The surface soil of Portsmouth loam consists of black mellow friable loam to a depth ranging from 10 to 18 inches. It contains a large amount of organic matter and an appreciable quantity of fine sand. The subsoil is light-gray, brown, or distinctly mottled light-gray and yellow friable fine sandy clay which extends to a depth of 40 or more inches. Adjoining areas of the Bladen and Bayboro soils, the subsoil of the Portsmouth soil is generally heavier. After a few years' cultivation, this soil loses some of its organic matter and becomes dark gray or dark grayish brown. In places, especially where this soil borders Pamlico muck, the surface soil is mucky, whereas where it adjoins Portsmouth fine sand, it is more sandy.

Portsmouth loam occurs in close association with Portsmouth fine sandy loam and Pamlico muck. The largest areas are northeast of Maysville and southeast of Dover along the Craven County line. A fair-sized area is along the Onslow County line southeast of Hargetts Store.

Portsmouth loam occupies almost level or flat areas, and natural drainage is poor. Open ditches are necessary to reclaim this land for farming.

Most of this soil is forested with sweetgum, together with some black gum, water oak, and pine, and a bush growth of gallberry, myrtle, and bay. Some merchantable timber remains, but much of the land has been cut over. In the cultivated areas, corn yields from 25 to 50 bushels an acre where from 300 to 500 pounds of 3–8–3 and a liberal amount of lime have been added. This soil has agricultural possibilities; if it were drained, good yields of corn, potatoes, soybeans, and cabbage, and fair yields of cotton could be obtained. Pasture grasses would do well. All crops require fertilization to produce the best yields, and the soil used for the growing of corn and soybeans should be limed. In some places wiregrass, broomsedge, and reeds furnish grazing for cattle during the spring and summer.

Portsmouth fine sandy loam.—To a depth ranging from 6 to 15 inches Portsmouth fine sandy loam is dark-gray or black fine sandy loam or loamy fine sand which is mellow and friable and contains a large amount or organic matter. It is underlain by light-gray fine sandy loam to a depth ranging from 20 to 24 inches, where it grades into light-gray fine sandy clay or mottled light-gray, yellow, and brown fine sandy clay, which continues to a depth ranging from 40 to 50 or more inches. In some of the slight depressions, the soil approaches a loam in texture, and in other places a few small areas of Portsmouth fine sand are included. In cultivated fields the surface soil is dark gray, and bordering areas of Pamlico muck the surface soil is almost a muck.

Portsmouth fine sandy loam occupies by far the largest acreage of the soils in this county, its total area being 70,114 acres, or 23.4 percent of the land area. Broad continuous areas are developed in practically all parts. This soil borders Pamlico muck in many places.

This soil occurs in pocosins (swamps), on flats, in slight depressions in the interstream areas of the county, and near the heads of streams. The land, which is prevailingly flat, has not been invaded by streams sufficiently to establish natural drainage and is, therefore, poorly drained. Canals and open ditches will be necessary in the drainage of this soil, if it is to be put under cultivation.

Portsmouth fine sandy loam supports a forest growth of pine, sweetgum, black gum, and water oak, and an undergrowth of gallberry, myrtle, and bay bushes. Some wiregrass and other grasses grow on the better drained areas and afford some pasturage during the summer. This soil, although not quite so strong as Portsmouth loam, has good agricultural possibilities if drained and reclaimed.

A very small acreage of Portsmouth fine sandy loam has been cleared and farmed. The crops grown are corn, cotton, soybeans, oats, and garden vegetables. Corn does best where the soil has been fertilized and limed, as this soil is very acid. In some other places

in eastern North Carolina, Portsmouth fine sandy loam is used to a considerable extent for the production of potatoes, cabbage, spinach, turnip greens, and other crops. Corn yields from 20 to 35 bushels an acre when fertilized with from 200 to 400 pounds of 3–8–3 fertilizer. If the corn crop follows a crop of potatoes which has been heavily fertilized no fertilizer is given to the corn.

MISCELLANEOUS NONAGRICULTURAL SOILS AND LAND TYPES

In this group are included Portsmouth fine sand, Leon sand, Pamlico muck, and swamp. A wide difference exists in the character of these soils and their drainage conditions. Leon sand is composed almost entirely of quartz sand and is characterized by the presence of a black or brown hardpan layer which is sand cemented with organic matter. Pamlico muck consists mainly of organic matter, together with a comparatively small content of mineral matter. Practically none of the soils or land types in this group is under cultivation, and under present conditions they have little value for agricultural development.

Leon sand.—Leon sand, locally known as "hardpan land", to a depth ranging from 3 to 5 inches consists of gray or dark-gray medium sand containing a small amount of organic matter. The subsurface layer is light-gray or almost white loose sand which extends to a depth ranging from 14 to 20 inches. It is underlain by a hardpan from 4 to 8 inches thick. This hardpan consists of sand cemented with organic colloidal material. The upper part of the hardpan is black or dark brown, and the lower part is brown. It grades into brown sand, and this gradually passes into very light gray or nearly white sand. In some places the hardpan layer lies from 30 to 40 inches below the surface. In a few places, the so-called hardpan is soft dark-brown sand merely stained with organic matter. In a few of the flatter and more poorly drained areas, the surface soil is dark gray or black, resembling St. Johns sand which has been mapped in some other counties in eastern North Carolina. Here and there are spots of almost white sand, in which the hardpan layer is not reached within a depth of 3 feet.

Leon sand has an almost level or undulating relief. Surface drainage is fairly good, but internal drainage is impeded by the hardpan layer which hinders the downward percolation of soil water. In normal seasons the sand underlying the hardpan is wet, and in some places the water table is immediately below the hardpan.

This soil is inherently low in the mineral plant nutrients. It is strongly acid throughout the profile. None, or practically none, of the land has been cleared or cultivated. Most of it has been cut over and now supports a growth of slash pine, scrub pine, a small amount of black gum, sweetgum, a few white oaks and maples, together with an undergrowth in some places of gallberry, myrtle, baybushes, and wiregrass. The best use for Leon sand is forestry.

Portsmouth fine sand.—The 8- to 14-inch surface soil of Portsmouth fine sand is black or very dark gray fine sand containing a large amount of organic matter which gives the sand a slightly loamy feel. In some places the content of fairly well decomposed organic matter is sufficiently high to render the soil mucky, and, in mapping, an arbitrary line has to be drawn between this soil and Pamlico

muck. The subsoil, to a depth of 3 feet or more, is light-gray or almost white fine sand which, in most places, is loose and generally wet or saturated. Here and there it has the characteristics of quicksand.

The largest areas are developed on the northern edge of Whiteoak Pocosin, bordering Pamlico muck on one side and Portsmouth fine sandy loam on the other. Portsmouth fine sand occupies flat areas and slight depressions and has a nearly level surface. Drainage has not been established, as the walls of ditches in this loose sand cave in badly.

None of this soil has been reclaimed for farming. It supports a scattered growth of pines, together with a dense undergrowth of baybushes, huckleberries, gallberries, and some bamboo briers. Wiregrass grows on some of the higher land and furnishes scant pasturage for cattle during the summer. Portsmouth fine sand is probably best suited to forestry, as such a soil gives low yields when farmed. It has some possibilities for the production of vegetables and corn when limed and heavily fertilized.

Pamlico muck.—There are three large areas of Pamlico muck. The largest occurs in the south-central part, bordering Onslow County, where it was mapped simply as muck. This area includes the Whiteoak Pocosin. A large area lies northeast of Maysville, around Catfish Lake and touching the Craven County line for a distance of several miles, and the third large area is in the northern part of the county, southeast of Dover.

Pamlico muck is composed of fairly well decomposed organic matter containing a comparatively small proportion of mineral matter. It is black or dark-brown to a depth ranging from 20 to more than 40 inches. It is underlain by gray or brown fine sand or light-gray rather compact fine sandy clay. The mineral matter in this muck is mainly silt and very fine sand. When the muck is dry, it will burn down to the water table. In burned-over areas, the surface is slightly irregular, as some tussocks, ranging from a few inches to a foot in height, are left on the recently burned areas and, in most places, some ash or charred particles are on the surface.

Pamlico muck occupies nearly flat high positions, having an almost level surface but a slight gradient from the center outward. Several streams head in the areas of Pamlico muck and flow out in various directions. The land is naturally poorly drained, and during normal seasons the water table is at or near the surface, whereas in rainy seasons the land may be covered with water.

Pamlico muck is not used for cultivated crops in this county. The forest consists of a scant growth of scrub or gnarly topped pine and a few gums, with an undergrowth of baybushes, gallberries, ferns, and bamboo briers. Near the outer margin of the muck areas, where drainage is better and the muck is shallower, the pines are larger, and in some places reeds grow.

Swamp.—Swamp is developed more or less along all the streams but to only a small extent along Trent River. Large rather continuous areas lie along Whiteoak River and Tuckahoe Swamp. Narrow strips occur along the small streams.

Swamp consists of alluvial material which has been washed from the uplands and deposited by the streams. It is subject to frequent

overflow and is saturated or covered with water a large part of the year. The materials composing swamp are variable in texture, structure, and color, ranging from dark-gray fine sandy loam to black loam or muck, and they are underlain by mottled gray and brown fine sandy clay or gray fine sand.

In extremely dry seasons, some of the swampland could possibly be used for pasture if the underbrush were cleared out and open ditches constructed to give such areas partial drainage. The main use of swamp is for forestry. The forest growth consists largely of sweetgum and cypress, together with some maple, sycamore, ash, poplar, water oak, hickory, and a few pines.

AGRICULTURAL METHODS AND MANAGEMENT

Under present economic conditions, most of the farmers are making excellent use of their soils as regards proper crop adaptation and the market demand for crops. If it is ever necessary to increase the production of these crops, especially soybeans, velvetbeans, peanuts, and truck crops, more land can be brought under cultivation. Large areas of Bladen very fine sandy loam, Bayboro loam, Portsmouth loam, Portsmouth fine sandy loam, and some of Lenoir very fine sandy loam are potentially good soils but have not been farmed because of adverse drainage conditions. Much of this land can be brought under cultivation by means of artificial drainage. It may be necessary to have community interests and cooperation, in view of the fact that some canals would be necessary, and these would have to be supplemented by lateral ditches.

The farmers recognize that the best soils for the production of bright-leaf tobacco, cotton, peanuts, and sweetpotatoes are Norfolk fine sandy loam, Norfolk fine sandy loam, deep phase, Craven very fine sandy loam, Dunbar very fine sandy loam, and Onslow fine sandy loam. For growing corn, soybeans, potatoes, cabbage, and other leafy vegetables, Bayboro loam, Portsmouth loam, and Portsmouth fine sandy loam are ideal soils which are used advantageously for the production of these crops in some other counties of the State.

All the soils in Jones County are acid or very strongly acid (for pH determination see table 5 in section Morphology and Genesis of Soils). Pamlico muck is extremely acid, having a pH of 3.7, and Bayboro loam and Onslow fine sandy loam also are strongly acid. They are the most acid mineral soils, having a pH of 3.8 and 3.7, respectively. Some farmers apply lime to these soils when certain crops are to be grown. Before lime is applied, the acidity of the soil should be determined, as this will give some indication of the amount of lime required. Some crops are much more tolerant of an acid soil than others. For example, potatoes grow best on a soil that has a pH value of 5 to 5.4. If the soil is too sweet, the potatoes are likely to be scabby because of the growth of fungi. The most favorable soil reaction for peanuts is about pH 6.5 or practically neutral. Tobacco does best on soil that has a pH of about 5.6.

Most of the farmers in this county use a 3–8–3 or 4–8–4 fertilizer. The North Carolina Agricultural Experiment Station has carried on field experiments with the different grades and quantities of fertilizers to be used in connection with the different crops on the different soils. Recommendations for the fertilization of soils in Jones County are given in table 4.

TABLE 4.—*Recommendations for the use of fertilizers for the leading crops on the principal soils in Jones County, N. C.*

Soil type	Fertilizer [1] recommended for—				
	Corn	Cotton	Peanuts (large)	Soybeans	Tobacco
	Pounds	*Pounds*	*Pounds*	*Pounds*	*Pounds*
Norfolk fine sandy loam	300 to 400 of 4–8–4 and side application of 100 of nitrate of soda.	500 of 4–8–4 and side application of 100 of nitrate of soda.	200 to 300 of 2–8–4.[2]	200 to 300 of 2–8–4.	800 to 1,000 of 3–8–6.
Craven very fine sandy loam.	300 of 4–8–4 and side application of 75 of nitrate of soda.	400 to 500 of 4–8–4 and side application of 100 of nitrate of soda.	200 of 2–8–4 [2]	250 of 2–10–6	700 to 800 of 3–10–6.
Lenoir very fine sandy loam.	do	do	do	do	Do.
Onslow fine sandy loam	do	do	do	do	Do.

[1] The quantities given are acre applications.
[2] The most favorable soil reaction for peanuts is about pH 6.5. If the reaction is more acid than this, 300 pounds of gypsum should be applied on the foliage at blooming time. Where tobacco is to be grown on the same soil, the reaction should be about pH 5.6. If these two crops are to be grown in rotation, therefore, it is advisable to hold the soil reaction to the lower limit and to apply gypsum to the peanuts.

The side applications should be made to corn when knee to waist high and to cotton before the first cultivation after chopping. If the tobacco crop follows a leguminous crop turned under, 1,000 pounds of a 2–10–6 mixture should be used. Sweetpotatoes, if grown for early market, should receive from 1,000 to 1,200 pounds of a 3–8–8 mixture; and, when grown for late harvesting, from 600 to 800 pounds of a 3–8–8 mixture. Potatoes should receive about 2,000 pounds of a 5–7–5 mixture. If more than 500 pounds of fertilizer an acre is applied in the drill, it should be distributed from a week to 10 days before planting and be thoroughly mixed with the soil.

As a general rule, the dark poorly drained soils, high in organic matter, are very acid and require liming. Where lime has not been added recently it is recommended that an application broadcast at the rate of 1 to 1¼ tons of ground limestone to the acre or its equivalent be made every 3 or 4 years or that its equivalent be used in small annual applications in the drill, to be mixed thoroughly with the soil before the fertilizer is added and planting is done. When needed for tobacco, the form of fertilizer recommended is dolomitic limestone, if the fertilizers used do not carry sufficient magnesia to meet the need of the crop.

The Craven and Norfolk soils are the most productive for tobacco and cotton. Norfolk fine sand is well suited to the production of many early truck crops, sweetpotatoes, peaches, blackberries, dewberries, and grapes. Bayboro loam and Portsmouth loam are the most productive soils for corn, and Portsmouth fine sandy loam is considered the best for potatoes. Norfolk fine sandy loam and Dunbar fine sandy loam are considered good soils for sweetpotatoes. The Craven and Onslow soils are also good for sweetpotatoes but not so productive as the Norfolk and Dunbar soils. Soybeans produce the highest yields on Bladen very fine sandy loam, Bayboro loam, and

Portsmouth loam. Peanuts do well on the Norfolk, Craven, and Lenoir soils.

Many of the soils, especially the Norfolk, Craven, Lenoir, and Onslow, are in need of organic matter. This can be supplied by applying barnyard manure or by growing and turning under leguminous crops, such as vetch and soybeans. Soybeans are probably the most practical crop to work in with the rotations. If they are cut for hay, little or nothing can be turned under for soil improvement, but if the seed is harvested with a harvester and the rest of the crop plowed into the land, considerable improvement in the organic matter and nitrogen content of the soil and in its producing power should result. Where this is done, the amount of nitrogen to be added in the fertilizer may be reduced from one-fourth to one-half for the first year; and later on, if the practice of growing soybeans is continued, the seed harvested, and the residue plowed under, a time may come when it will be unnecessary to purchase any nitrogen from commercial sources.

Deep plowing is hardly necessary on any of the light-textured soils, as breaking to a depth of 6 or 8 inches is all that is necessary. The heavier soils require stronger work animals and heavier machinery. Terracing the land, except on some of the slopes near the larger streams, is unnecessary. The following crops and varieties of each are recommended as adapted to the soils of Jones County: Corn for grain—Latham Double, Biggs Two-ear, Cocke Prolific, Highland Horsetooth, Jarvis Golden Prolific (yellow), and Indian Chief (yellow); corn for silage—Latham Double, Highland Horsetooth, and Eureka; cotton—Cleveland 884, strain 4, Coker-Cleveland 5, strain 5, Mexican 87–8, Coker Farm Relief, strains 1 and 2, and Humco-Cleveland 52; peanuts—Jumbo Runner, Virginia Bunch, North Carolina Bunch, Virginia Runner, and North Carolina Runner; soybeans for soil improvement—Otootan and Mammoth Yellow; soybeans for hay—Otootan and Laredo; soybeans for pasture and seed—Mammoth Yellow, Biloxi, Tokyo, Herman, and Laredo; tobacco—Cash, Whitestem Orinoco, Jamaica (wrapper), and Bonanza; oats—Fulghum, Norton, Coker 32–1, and Appler for fall sowing, and Burt for spring sowing.

The following crop rotations are recommended on the well-drained fine sandy loams and very fine sandy loams: For cotton and corn farmers—rotation no. 1, first year, corn (for grain) with soybeans (for seed or grazing) or velvetbeans (for grazing) (all vines to be turned under); second year, spring oats (for hay), with lespedeza (for hay or grazing) or soybeans (for hay, seed, or grazing); third year, cotton, vetch, or crimson clover in fall (to be turned under for corn); rotation no. 2, first year, corn (for grain) with soybeans (for seed or grazing) or velvetbeans (for grazing) (all vines to be turned under); Abruzzi rye in fall (for grazing and turning under); second year, soybeans (for seed or hay) or peanuts (for nuts and hay); third year, cotton, vetch, or crimson clover in fall (for turning under); rotation no. 3, first year, corn (for grain) with soybeans (turned under), Abruzzi rye; second year, Abruzzi rye (for seed), followed by soybeans and velvetbeans mixed (for grazing and turning under); third year, cotton, with crimson clover after first picking (turned under the following spring). For tobacco farmers on the same soils—rotation no. 1, first year, tobacco, Abruzzi rye, vetch, or crimson clover in fall (for turning under); second year, corn (for grain) with velvetbeans (for grazing and turning under); third year, cotton, Abruzzi rye in fall (turned under the following spring); rotation no. 2, first year, tobacco, with cowpeas at last cultivation (for turning under); second year, cotton or corn, Abruzzi rye in fall (turned under the following spring). For peanut and cotton farmers on the same soils—rotation no. 1, first year, peanuts followed by crimson clover and Abruzzi rye (turned under); second year, corn, with cowpeas (for turning under); third year, cotton, followed by crimson clover or vetch (turned under). For strawberry growers and general farmers—rotation no. 1, first year, corn (for grain) with soybeans or cowpeas (turned under); second year, cotton; third year, sweetpotatoes; fourth year, strawberries; fifth year, strawberries.

The following rotations are recommended for general and truck farmers on the poorly and moderately poorly drained fine sandy loams and very fine sandy loams: Rotation no. 1, first year, corn (for grain); second year, potatoes or early truck crops, followed by corn (for grain) or soybeans (for hay); third year, soybeans (for seed, vines turned under), or oats (for hay), followed by lespedeza (for turning under); rotation no. 2, first year, peanuts, followed by crimson clover; second year, crimson clover (turned under); corn, with cowpeas at last cultivation; third year, corn; rotation no. 3, first year, corn (for grain), with soybeans in the corn (for seed, grazing, and turning under); second year, cotton or truck crops, followed by fall seeding of Abruzzi rye (for grazing and turning under); third year, tobacco, with cowpeas sown in tobacco at last cultivation (for turning under).

The following rotation is recommended for Bayboro loam, Portsmouth loam, and Portsmouth fine sandy loam: First year, corn (for grain); second year, soybeans (mainly for seed and turning under and partly for hay).

A rotation recommended for Norfolk fine sandy loam, deep phase, and Norfolk fine sand follows: First year, tobacco, Abruzzi rye, and vetch or crimson clover in the fall (for turning under); second year, sweetpotatoes, Abruzzi rye in fall (for turning under); third year, wild grasses and weeds. These soils are particularly well suited for the production of early sweetpotatoes and many of the early truck crops.

The following grass-seed mixtures are recommended for permanent pastures on well-drained or fairly well drained fine sandy loams or very fine sandy loams (mainly Norfolk soils): Carpet grass, 10 pounds; Dallis grass, 5 pounds; and lespedeza (common) 15 pounds. This makes a total seeding of 30 pounds an acre. Another mixture consists of Bermuda grass cuttings; Dallis grass, 5 pounds; and lespedeza (common) 15 pounds. This makes a total seeding of 20 pounds an acre. For fertile black poorly drained loams and fine sandy loams the following mixture is recommended: Kentucky bluegrass, 8 pounds; redtop, 10 pounds; white (Dutch) clover, 4 pounds; and lespedeza (common), 12 pounds. This makes a total seeding of 34 pounds an acre. The following mixture is recommended for fertile light-colored soils: Carpet grass, 10 pounds; Dallis grass, 5 pounds; Kentucky bluegrass, 5 pounds; redtop, 5 pounds; white (Dutch) clover, 3 pounds; and lespedeza (common), 12 pounds. This is a total seeding of 40 pounds an acre. The following is a list

of publications which will give more detailed information regarding agricultural methods and management in Jones County. This list is furnished by the North Carolina State College, Raleigh, N. C.

North Carolina Agricultural College Extension Circulars 24, How to Use Lime on the Farm; 57, Soybeans—a Future Economic Factor in North Carolina; and 165, Crop Rotations for the Coastal Plain Section of North Carolina.

North Carolina State Department of Agriculture Agronomy Information Circular 11, Results of Soil Building Demonstrations in North Carolina.

North Carolina Agricultural Experiment Station Bulletin 293, Agricultural Classification and Evaluation of North Carolina Soils.

MORPHOLOGY AND GENESIS OF SOILS

Jones County lies in the flat or seaward 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 ranges from near sea level in the eastern part to 50 or more feet above, along the western border of the county. The relief is dominantly flat or undulating, and, over a large part of the county, natural drainage or incision by streams is poorly developed. Erosion has played practically no part in the destruction of the original material as laid down by the sea, except in some of the more sloping areas.

The soils of this county have developed under a forest cover consisting of pines and hardwoods. The well-drained soils have had no opportunity to accumulate an appreciable amount of organic matter within the soil profile. The rainfall averages about 56 inches annually, and there is an average frost-free period of 223 days. Leaching is continuous, except for a brief time during the winter. The black soils, high in organic matter, have developed under swampy and semiswampy conditions which have favored the heavy growth of vegetation, and the partial decay of this vegetation for a long period is responsible for the presence of a large quantity of organic matter.

All the soils are acid or very strongly acid. The leaves, and pine needles in particular, which fall on the ground are acid. Pamlico muck is the most strongly acid type of land in the county. Of the mineral soils, Onslow fine sandy loam and Bayboro loam are the most acid. Table 5 gives the results of pH determinations on samples of a number of important soils in this county.

TABLE 5.—*pH determinations on samples of a number of important soils in Jones County, N. C.*[1]

Soil type and sample no.	Depth	pH	Soil type and sample no.	Depth	pH
Norfolk fine sandy loam:	*Inches*		Lenoir very fine sandy loam:	*Inches*	
238601	0–5	5.2	238613	0–7	4.1
238602	5–14	5.1	238614	7–9	4.2
238603	14–30	4.8	238615	9–38	4.3
238604	30–40+	4.5	238616	38–46+	4.1
Bayboro loam:			Onslow fine sandy loam:		
238605	0–6	3.8	238617	0–5	3.7
238606	6–10	4.1	238618	5–8	4.0
238607	10–40+	4.1	238619	8–30	4.3
Craven very fine sandy loam:			238620	30–40+	4.4
238608	0–6	5.0	Pamlico muck:		
238609	6–9	4.4	238621	0–36	3.7
238610	9–19	4.3			
238611	19–40	4.5			
238612	40–60	4.2			

[1] Determinations were made by the hydrogen-electrode method in the laboratories of the Bureau of Chemistry and Soils.

The soil-forming material which underlies the region consists of beds of heavy clays and fine sandy clays of recent geological age and deposition. Over a considerable part of this county, extensive low flat areas have not been invaded by stream channels, and much of the material maintains the structural form as laid down by the sea. From the weathered and partly weathered material, the soil-forming agencies have developed markedly distinct soils. The character of the parent material, together with drainage conditions, determines largely the type of soils which have developed. For example, the parent material under the Norfolk, Dunbar, Onslow, and Portsmouth soils is dominantly fine sandy clay, whereas the parent material under the Bayboro, Lenoir, and Bladen soils is heavy clay or heavy fine sandy clay. A striking difference exists between the Norfolk and Portsmouth soils, although they are underlain by the same parent material. This is due to the imperfect drainage conditions under which the Portsmouth soil has remained for a long time.

Norfolk fine sandy loam is the only soil in this county that has developed a normal soil profile. This soil has 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 of the soils except the Norfolk, Dunbar, Craven, and Onslow.

Most of the soils do not have a normally developed soil profile, because of their imperfect drainage. The water table has remained near the surface over a large 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 swamp, Bayboro or Bladen, Craven, Dunbar, and Norfolk.

A description of a profile in a representative virgin area of Norfolk fine sandy loam is as follows:

A_0. A thin covering of pine needles and other organic debris.

A_1. 0 to 4 inches, light-gray loamy fine sand containing a small amount of organic matter.

A_2. 4 to 13 inches, grayish-yellow or pale-yellow loamy fine sand or light fine sandy loam, which is mellow and friable and of single-grain structure. The material in this layer 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. The material in this layer is uniform in color. It is the illuviated part of the profile.

B_2. 26 to 36 inches, yellow or slightly brownish yellow friable fine sandy clay, somewhat heavier than the layer above.

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

Below a depth of 60 inches is similarly colored fine sandy clay material which shows slight stratification.

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

The Dunbar soils differ from the Norfolk mainly in being less well drained and in not having a normally developed soil profile. The lower part of the B horizon is mottled and slightly heavier, and the C material also is heavier than that under the Norfolk.

Onslow fine sandy loam resembles the Norfolk and Dunbar soils, but it differs from them in having a thin hardpan or brown layer near the surface and a B horizon intermediate in color and structure between those soils.

Craven very fine sandy loam resembles Norfolk fine sandy loam, but it differs from that soil in having 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 material is heavy clay not materially different from that in the corresponding layer of Lenoir very fine sandy loam.

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

The Bayboro and Portsmouth soils are black, because of a high content of organic matter. The Portsmouth soils differ from the Bayboro in having a mottled friable sandy clay B layer, whereas the B layer under the Bayboro soils is steel-gray heavy plastic clay mottled and streaked with yellow, similar to the corresponding layer in the Bladen soil.

Leon sand belongs with the group of soils known as Ground-Water Podzols and is characterized by a black or dark-brown so-called hardpan layer consisting of sand cemented mainly with organic matter. This hardpan layer in general is developed anywhere between depths of 12 and 30 inches below the surface, and it ranges in thickness from 3 to 8 inches.

The areas of Kalmia fine sand are developed on the terraces and second bottoms from materials washed from soils in the coastal plain region and brought down and deposited by the streams at times of overflow. In color, texture, and structure, Kalmia fine sand is similar to Norfolk fine sand of the upland.

Large areas of organic soil are mapped as Pamlico muck which consists of fairly well decomposed organic matter, together with a small amount of mineral matter. In addition to the recognized soil types, there are rather extensive areas of swamp. Swamp represents material so variable in color, texture, and structure that no type designation could be assigned it.

SUMMARY

Jones County lies in the low or seaward part of the Atlantic Coastal Plain in eastern North Carolina. The general relief ranges from that of large continuous flat or almost level and undulating areas to sloping areas bordering the drainageways or adjacent to the bottom lands. The general slope is to the east and southeast. The elevation above sea level is more than 50 feet in the western part, and it is almost at sea level in the southeastern corner along Whiteoak River. Over a large part of the county natural drainage has not been established. Good paved roads cross the county. The climate is mild and pleasant during the greater part of the year. This is partly because of the ameliorating influence of the nearby ocean. The rainfall is ample and well distributed throughout the growing season.

Many different truck crops can be grown in the early spring, and some of the hardy vegetables can be produced during the winter. Tobacco and cotton are the important cash crops. The acreage

planted to corn is greater than that of the combined acreage of all other cultivated crops. Corn is grown on all the cultivated soils and is considered the main subsistence crop. A few potatoes, peanuts, tomatoes, cucumbers, and cabbage are grown on a commercial scale; and sweetpotatoes, hay crops, garden vegetables, and some fruits are grown for use in the home and on the farm. Hog raising is engaged in on a commercial basis.

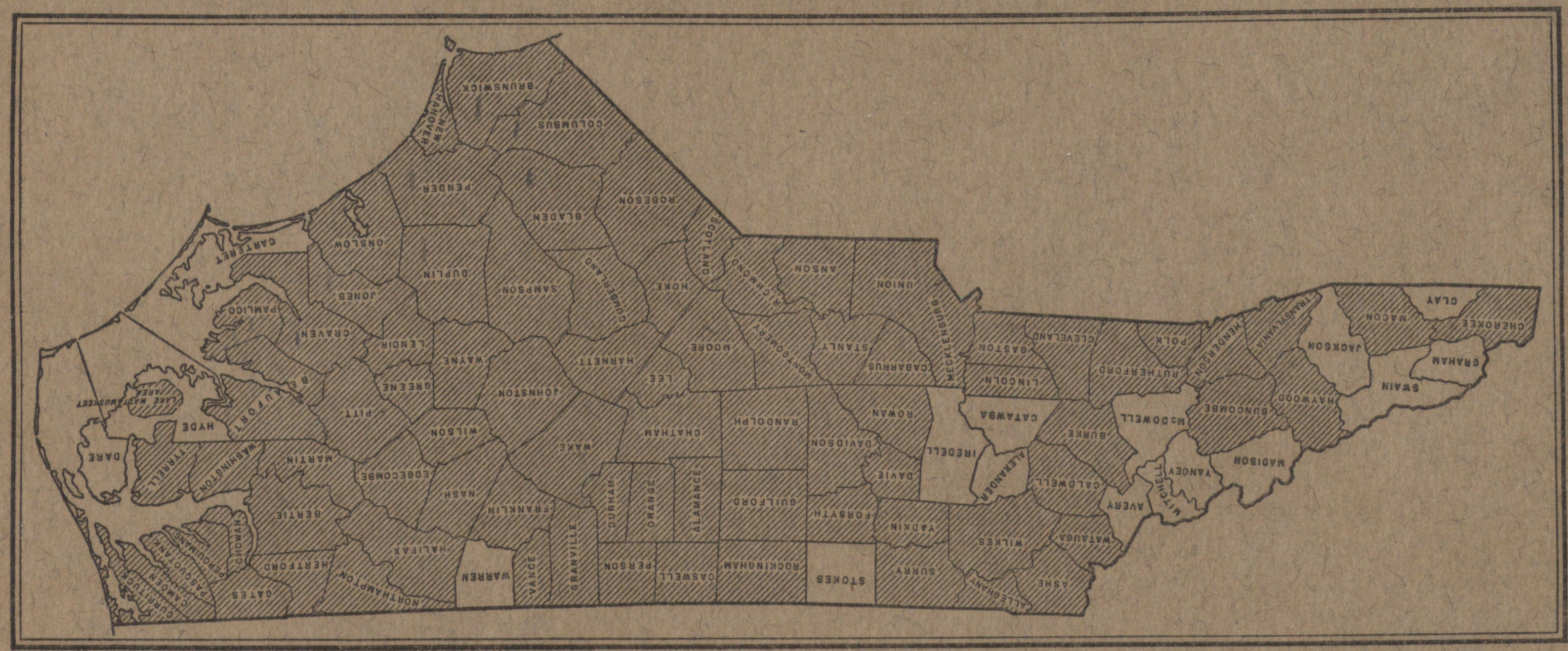
About 17 percent of the land is under cultivation. The principal agricultural soils are Norfolk fine sandy loam, Norfolk fine sandy loam, deep phase, Craven very fine sandy loam, Dunbar fine sandy loam, Lenoir very fine sandy loam, and Onslow fine sandy loam. These are the best drained soils in the county, although they are not the most fertile. On them are grown practically all of the tobacco, cotton, peanuts, sweetpotatoes, and much of the corn. These soils respond readily to applications of commercial fertilizers and manures and to the turning under of leguminous crops.

There are rather extensive areas of Bladen very fine sandy loam, Lenoir very fine sandy loam, Bayboro loam, Portsmouth loam, and Portsmouth fine sandy loam, but only a small proportion of these soils has been cleared and farmed, on account of the inadequate drainage. Bladen very fine sandy loam, Bayboro loam, and Portsmouth loam are considered the most fertile soils in the county. If there is ever a greater demand for corn, soybeans, potatoes, and cabbage, these soils offer agricultural possibilities. It will be necessary to drain these lands by means of canals and lateral ditches. In some places in other counties in eastern North Carolina, these soils have been drained and are producing large yields of the above-mentioned crops.

U. S. GOVERNMENT PRINTING OFFICE: 1938

Authority for printing soil survey reports in this form is carried in the Appropriation Act for the Department of Agriculture for the fiscal year ending June 30, 1933 (47 U. S. Stat., p. 612), as follows:

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 250 copies shall be for the use of each Senator from the State and not more than 1,000 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.