Series 1929 Number 23

UNITED STATES DEPARTMENT OF AGRICULTURE

Soil Survey of Craven County, North Carolina

By

R. C. JURNEY
United States Department of Agriculture, In Charge

and

W. A. DAVIS and J. J. MORGAN
North Carolina Department of Agriculture and
North Carolina Agricultural Experiment Station

Bureau of Chemistry and Soils

In cooperation with the
North Carolina Department of Agriculture
and the
North Carolina Agricultural Experiment Station

sale by the Superintendent of Documents, Washington, D.C. - - - - - - - - Price 50 cents

BUREAU OF CHEMISTRY AND SOILS

HENRY G. KNIGHT, *Chief*
A. G. McCALL, *Chief, Soil Investigations*
SYDNEY FRISSELL, *Editor in Chief*

SOIL SURVEY

CURTIS F. MARBUT, *in Charge*
W. E. HEARN, *Inspector, District 2*
J. W. McKERICHER, *in Charge Map Drafting*

COOPERATION

NORTH CAROLINA DEPARTMENT OF AGRICULTURE
W. A. GRAHAM, *Commissioner*
and
NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION
R. Y. WINTERS, *Director*
C. B. WILLIAMS, *in Charge Soil Survey*

CONTENTS

	Page
County surveyed	1
Climate	3
Agricultural history and statistics	4
Soils and crops	6
Light-colored well-drained soils	8
Norfolk fine sandy loam	9
Norfolk fine sandy loam, deep phase	10
Norfolk sandy loam	10
Norfolk sandy loam, deep phase	10
Norfolk very fine sandy loam	10
Norfolk sand	11
Norfolk fine sand	11
Craven fine sandy loam	11
Craven sandy loam	12
Cuthbert fine sandy loam	12
St. Lucie sand	12
Light-colored poorly drained soils	13
Dunbar fine sandy loam	14
Dunbar sandy loam	14
Onslow fine sandy loam	15
Onslow sandy loam	15
Lenoir very fine sandy loam	15
Lenoir fine sandy loam	16
Bladen very fine sandy loam	16
Bladen very fine sandy loam, deep phase	16
Bladen loam	16
Bladen sandy loam	16
Coxville very fine sandy loam	17
Coxville clay loam	17
Plummer fine sandy loam	17
Leon sand	17
Dark-colored or black poorly drained soils and organic soils	18
Portsmouth fine sandy loam	18
Portsmouth fine sandy loam, swamp phase	19
Portsmouth sandy loam	19
Portsmouth loam	19
Hyde loam	19
St. Johns sand	20
Okenee loam	20
Muck	20
Swamp	20
Marsh	21
Agricultural methods and management	21
Soils and their interpretation	23
Summary	26
Map.	

SOIL SURVEY OF CRAVEN COUNTY, NORTH CAROLINA

By R. C. JURNEY, United States Department of Agriculture, in Charge, and W. A. DAVIS and J. J. MORGAN, North Carolina Department of Agriculture and North Carolina Agricultural Experiment Station

COUNTY SURVEYED

Craven County is in the eastern part of North Carolina (fig. 1). New Bern, the county seat, is about 100 miles southeast of Raleigh, the State capital, and the southern boundary of the county lies about 15 miles from the Atlantic coast. The county is very irregular in outline. Its greatest length is about 52 miles, and the narrowest part is only about 8 miles wide. The total area is 699 square miles, or 447,360 acres.

The general surface configuration is that of a nearly level plain, broken only by narrow, shallow valleys. The differences in relief throughout the county are not great, the most noticeable surface features occurring near the streams and extending inland for a distance ranging from a few hundred feet to about 2 miles. The surface relief in these areas is undulating or gently rolling. In places along Neuse River well-rounded or abrupt bluffs rise to a height ranging from 10 to 20 feet, and here short streams have cut narrow valleys to enter the river. In such places the relief is more rolling than elsewhere. In the country between Neuse River and Swift Creek, the surface relief is gently rolling with intervening flats. The rolling relief of this part of the county is owing to a narrow strip of country where numerous small streams entering Neuse River and Swift Creek have cut nearly to base level. Areas more distant from these main drainage arteries have not been invaded by streams because the streams would not have the same fall to base level. The surfaces of the swamps and marshes are practically level. In the western, eastern, and southwestern parts of the county are comparatively extensive areas which are almost level. These areas include Great Dover Swamp which extends into Jones County, Big Pocoson which is partly in Beaufort County, and Lakes Pocoson which is partly in Jones and Carteret Counties. These pocosons have an imperceptible grade from the center outward. Natural drainage ways have not yet reached into these places, and for this reason the surface relief is smooth and flat. In addition to these large areas, many smaller flat areas are near the sources of streams."

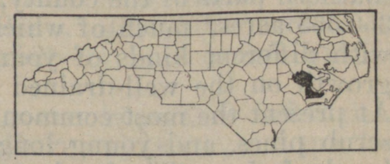


FIGURE 1.—Sketch map showing location of Craven County, N.C.

According to the United States Geological Survey, the elevations above sea level within the county range from 15 feet at New Bern to 63 feet at Dover, the highest point. No data are available for

E. B. JOYNER LIBRARY
EAST CAROLINA UNIVERSITY

points in the southern part of the county below Thurman. The general slope of the land is southeastward.

Drainage is effected through Neuse River and its many tributaries which branch out into different parts of the county. Much of the upland near the streams is naturally well drained, but, on nearly every farm, ditches are necessary to carry off the surplus water. In the pocoson areas and in other flats there is no drainage, owing to the lack of natural outlets, and, on account of their low position, the swamps and marshes are inadequately drained, remaining partly saturated throughout the greater part of the year. The streams range from a few feet to about 30 feet below the general level of the uplands, the valleys are narrow, and the streams are sluggish, but in former times some of them were used for the development of water power.

In the eastern part of the county, north of Truitt Church, a drainage district has been established and the canals cut, but further development at present (1929) is at a standstill. A smaller area has been drained in the vicinity of Maplecypress and is being farmed. Drained areas lie west of Havelock and Croatan, but these are not farmed at present although they were at one time.

Forested land occurs in large tracts in the western, eastern, and southern parts of the county, the total estimated forested area being 350,563 acres,[1] much of which consists of cut-over land growing up with different kinds of young trees. The prevailing original tree growth on the well-drained areas was longleaf and loblolly pines. At present the most common growth is loblolly pine, second-growth scrub pines, and young longleaf pine, with some scattered mature longleaf pines. The hardwoods are comparatively inextensive. They include red, white, post, water, and scrub oaks, hickory, dogwood, maple, and birch. The trees in the swamps are mainly sweetgum and black gum, with some cypress, poplar, ash, maple, birch, oak, and slash pine. In nearly all the forested areas there is an undergrowth of gall berry, myrtle, bay or holly bushes, and various briers.

In the open pocoson areas, the vegetation is a sparse or scattered growth of crooked stunted pine and an undergrowth of various shrubs, baybushes, briers, moss, and in places reeds.

Craven County was one of the original precincts of the Lords Proprietors. It derives its name from William, Earl of Craven. In 1707, a colony of Huguenots settled on Neuse and Trent Rivers. In 1710, the first permanent colony, consisting of Swiss and Germans, was established at New Bern, and in the same year a colony of Welsh Quakers settled below New Bern on Clubfoot and Hancock Creeks. At later dates Scotch and English settlers came from other sections of the State and from Virginia. The present population consists of descendants of these settlers and others who have moved from other parts of the State. The 1930 census[2] reports 11,981 urban and 18,684 rural inhabitants in the county, or an average rural population of 28.3 persons a square mile. The county is unevenly settled, the more thickly populated sections being in the northern part in the vicinity of Dover, Jasper, Fort Barnwell, Maplecypress, Vanceboro, and Ernul, and in the central and southern parts near New Bern, Riverdale, Croatan, Havelock, and North Harlowe. The county could accommodate a much greater rural population as there is much cleared or abandoned land, cut-over land, and other land which could be reclaimed for crops or for cattle raising.

[1] Forest Service Office, New Bern, N.C.

[2] Soil survey reports are dated as of the year in which the field work was completed. Later census figures are given when available.

New Bern is the county seat and largest town, with a population of 11,981. Other towns are James City, Dover, Bridgeton, Vanceboro, Cove, Clark, North Harlowe, and Fort Barnwell.

Railroad facilities are adequate, as nearly all sections are in easy reach of a railroad station. Lines of the Norfolk Southern and the Atlantic Coast Line Railroads operate in the county. Neuse River, Trent River, and Swift Creek are navigable streams which are used to some extent for carrying freight and for towing logs. State highways pass through or near important agricultural sections. State Highways No. 10 and No. 30 cross the county, No. 302 extends from New Bern into Pamlico County, and No. 301 leads from Vanceboro into Pitt County. These highways, with the exception of No. 301, are hard surfaced. County roads extend to different sections, and they are kept in a fair state of repair.

Churches and schoolhouses are located at convenient places. Several of the schools are of the modern consolidated type. A farm-life school is located at Vanceboro. Telephone service is available in some sections, and rural-delivery mail routes extend to practically all parts of the county.

Logging and lumber manufacturing are important industries. Large lumber mills are located at New Bern and Dover, and smaller mills elsewhere. Several other industries are at New Bern, some of the important products manufactured being fertilizer, cottonseed meal, and cottonseed oil. There are 2 tobacco redrying plants and 2 veneer plants, 1 of which manufactures crates and packages for shipping vegetables. Two brickyards are near New Bern. A pickle factory is being started (1929) which will use cucumbers, cabbage, and possibly other vegetables grown in the vicinity. One ice-cream plant uses the local available milk supply. A factory manufactures handles and spokes from ash, hickory, and oak timber. In 1928, a large fish-storage plant was established, with a capacity of 500,000 pounds of fish, and plans are now being made to enlarge this plant.

CLIMATE

The climate of Craven County is oceanic, owing to the proximity of the Atlantic Ocean. The weather is mild throughout the year, and there is no wide difference in temperature between summer and winter. Some cold periods occur when the temperature drops to 20° F., but they are usually of short duration. The winters are sufficiently mild for growing cover crops and hardy vegetables, and outdoor work can be performed most of the winter, as the ground is frozen to only a slight depth for short periods. Snow falls occasionally, but the snows are light and remain on the ground only a short time. Truck crops—such as cabbage, English peas, potatoes, beets, and string beans—are successfully grown for late spring or early summer shipment.

654490

The average date of the latest killing frost is April 3 and of the earliest is November 7, giving an average frost-free season of 218 days, or slightly more than 7 months. The date of the earliest recorded killing frost is October 10, and of the latest April 25.

The rainfall is ample and is well distributed throughout the year, the heaviest amount coming in the spring and summer.

Table 1, compiled from records of the United States Weather Bureau station at New Bern, gives the more important climatic data for Craven 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	46.7	81	5	3.72	4.79	3.64	0.9
January	45.9	83	4	3.95	1.74	5.60	1.1
February	46.2	81	2	4.12	4.12	5.20	1.7
Winter	46.3	83	2	11.79	10.65	14.44	3.7
March	53.9	92	17	4.12	3.85	6.73	.2
April	60.3	94	27	3.80	1.91	3.61	(1)
May	69.4	99	30	4.42	2.68	11.53	.0
Spring	61.2	99	17	12.34	8.44	21.87	.2
June	76.2	103	48	5.99	2.98	9.95	.0
July	79.0	101	54	7.80	2.55	17.60	.0
August	78.3	100	53	7.48	3.68	11.77	.0
Summer	77.8	103	48	21.27	9.21	39.32	.0
September	73.1	100	41	5.17	.74	2.76	.0
October	63.5	98	26	3.67	4.89	9.38	.0
November	54.0	86	16	2.55	1.33	2.37	(1)
Fall	63.5	100	16	11.39	6.96	14.51	(1)
Year	62.2	103	2	56.79	35.26	90.14	3.9

[1] Trace.

AGRICULTURAL HISTORY AND STATISTICS[3]

Agriculture began in Craven County about 1710, the date of settlement of the first permanent colony, and it has remained the chief industry. At first agriculture was confined to land near New Bern, along Trent River, and along Clubfoot and Hancock Creeks, and it is still largely confined to the better-drained soils along or near Neuse River and its tributaries. The early agriculture consisted of the production of wheat, oats, rye, corn, peas, and cotton, together with the raising of cattle, sheep, and hogs. The production of lumber, tar, pitch, and turpentine constituted an important industry.

[3] Historical data obtained mainly from the following publication: WHEELER, J. H. HISTORICAL SKETCHES OF NORTH CAROLINA FROM 1584 TO 1851. A REPRINT OF THE ORIGINAL EDITION AS WRITTEN IN 1851. 480 p., illus. New York. [1925.]

The chief products exported were beef, pork, tallow, hides, deerskins, furs, pitch, tar, wheat, corn, peas, masts, staves, headings, boards, rosin, turpentine, gums, rice, brick, and tile. The production of tar, pitch, and turpentine ceased about 1900, when the resources were practically exhausted, but the lumber industry has continued on a large scale.

According to the 1880 Federal census, the leading crops in respect to acreage were corn, cotton, sweetpotatoes, rice, oats, and wheat. Table 2, compiled from census data, gives the acreage and yield of farm crops for the years 1879, 1899, 1919, and 1929.

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

Crop	1879		1899		1919		1929	
	Acres	Bushels	Acres	Bushels	Acres	Bushels	Acres	Bushels
Corn	19,001	218,256	15,943	171,440	19,809	479,436	17,515	336,327
Oats	333	4,426	513	7,140	233	3,280	12	120
Sweetpotatoes	1,323	115,538	929	70,008	1,084	112,079	690	59,360
Potatoes		8,121	753	80,921	212	19,264	647	65,310
Peanuts			223	5,911	129	3,315	446	11,696
Cowpeas			620	6,575	208	1,381	325	2,727
Soybeans					446	7,366	2,906	30,435
		Bales		Bales		Bales		Bales
Cotton	12,838	5,782	6,332	2,561	10,538	7,060	4,762	1,402
		Pounds		Pounds		Pounds		Pounds
Tobacco	6	2,732	1,154	934,760	8,905	6,723,471	12,706	7,966,727
		Tons		Tons		Tons		Tons
Hay and forage	9	8	1,122	1,589	2,551	1,866	4,401	4,019

The 4,401 acres devoted to hay and forage in 1929 included clover on 14 acres, with a yield of 16 tons; alfalfa on 2 acres, yielding 4 tons; other tame grasses on 686 acres, yielding 523 tons; wild grasses on 52 acres, yielding 29 tons; small grains cut for hay on 446 acres, yielding 405 tons; and annual legumes for hay on 3,201 acres, yielding 3,042 tons. The annual legumes included cowpeas, soybeans, and peanuts.

Table 2 indicates that the corn acreage has remained fairly constant since 1879, and that the cotton acreage has declined. The production of tobacco on a commercial basis was begun between 1890 and 1900 and has shown a very marked increase in acreage. Hay and forage were reported on 9 acres in 1879, but the acreage has greatly increased and by 1929 reached a total of 4,401 acres. The acreage in small grains harvested for grain is negligible, but grains from a fairly large acreage are cut green for hay. Rice was produced until the year 1900, but since then no acreage has been reported by the census.

The 1930 census reports that, on April 1, 1930, 574 horses, 2,238 mules, and 2,023 cattle, of which 1,006 were cows and heifers more than 2 years old kept mainly for milk production, were in the county. The total number of hogs was 11,313. According to a statement of the county farm agent, the raising of hogs on a commercial basis was started in 1924, and in that year 4 carloads were shipped from the county. In 1928 the shipment amounted to 44 carloads, and it is estimated that in 1929 it will reach 55 carloads. The principal breeds of hogs are Duroc-Jersey and Hampshire. The shipment of

poultry in quantities began in 1926 when one half carload was shipped. During 1929 the shipments had increased to 4 carloads of live poultry, consisting mainly of chickens, with some turkeys and geese.

Seven regular dairies and seven part dairies are in the vicinity of New Bern and supply local demands for milk. Most of the dairy cows are Jerseys and Guernseys.

Fertilizers, most of them ready mixed, are in general use, the 1930 census stating that 92.6 percent of the farmers used fertilizers on their crops in 1929. In that year, according to the census data, $335,399 were spent for fertilizer on 1,947 farms, an average of $172.26 a farm reporting. The principal grades used for tobacco are 3–8–3[4] and 3–8–5; for corn, a 3–8–3 grade with an addition of nitrate of soda or sulphate of ammonia as a side application; and for cotton a 3–8–3, 4–8–4, or 4–10–3 grade. Raw marl, burnt oyster shells, or ground or burnt limestone are applied by some farmers on corn, cotton, and hay land, and magnesian limestone is used by some on tobacco land.

The farm labor includes both white and colored workers, and the price paid for help ranges from 75 cents to $1.50 a day. Cotton pickers are paid from 50 cents to $1 a hundred pounds of seed cotton picked, and vegetable gatherers are paid by the package, earning from $1 to $2 a day.

The average size of farms is 60.7 acres, of which 40.3 percent, or 24.5 acres, is improved land. Many small farms range from 20 to 40 acres in size, a few large ones include more than 400 acres, and 4 farms contain more than 1,000 acres each. There are some large holdings of timberland, some of which include several thousand acres.

According to the 1930 census, 48.3 percent of the farms are operated by owners, 51.6 percent by tenants, and 0.1 percent by managers. Less than 8 percent of the tenanted farms are rented on a cash basis, the rental ranging from $3 to $5 an acre. When land is rented on a share basis, if the landowner furnishes the land and one third of the fertilizer, he receives one third of the crop. In case the landlord furnishes, besides the land, the work animals and one half of the fertilizer, he receives one half of the crop.

The farmhouses are amply large and are substantial, but many of the tenant houses are small. The barns are sufficiently large for the livestock kept, and on most farms there are several outbuildings for storage purposes. The farm equipment for the average farm consists of 1 or 2 wagons, 1 or 2 carts, from 2 to 4 horses or mules, a disk harrow, a spike-tooth harrow, 2 turning plows, 4 single plows, a riding cultivator, and a riding tobacco transplanter. Some farms have tractors, fertilizer distributors, lime distributors, and manure spreaders. The fences are mainly of woven wire, although barbed wire is used to some extent.

SOILS AND CROPS

One of the most outstanding features in connection with the agriculture and soils of Craven County is that only about one seventh

[4] Percentages, respectively, of nitrogen, phosphoric acid, and potash. State publications give the analyses of fertilizers in the order—phosphoric acid, nitrogen, and potash.

of the land, or 61,702 acres, is under cultivation or in pasture. The unused land consists of extensive areas of cut-over land and areas of pocosons, muck, and swamp. These support a forest growth, some of which is merchantable, but over large areas the merchantable timber is scattered and other areas support only a growth of stunted pine. The agricultural value of part of the land has not warranted the expense of clearing and draining and will not warrant this expense under present economic conditions. However, large areas of good soil have not been cleared and drained.

The underlying geological formations, from which the soils have been derived, are the same over the greater part of the county, and climatic conditions are uniform. The soils are, therefore, mainly the products of geographic environment, their character being controlled largely by local variations of surface relief and drainage. The conditions produced by these factors have developed soils that differ widely in physical and chemical composition. Perhaps in no other part of the Southern States is the influence of soil character more strongly impressed on the agriculture than in the lower Coastal Plain counties of the Carolinas. Craven County may be termed a typical area in this general region, in which a clear relationship exists between agriculture and soils.

The agriculture of the county is based on the production of corn, tobacco, cotton, and soybeans and to less extent on truck crops, cowpeas, oats, and sweetpotatoes. Peanuts are grown mainly for fattening hogs, although some are sold for cash. No single crop dominates the agriculture. Corn is the leading crop in point of acreage and was grown on 17,857 acres in 1929. It is grown for feeding work animals, fattening hogs, and supplying meal for home use. The yields are usually low on the light-colored soils, owing to their sandy character, low humus content, and lack of available plant nutrients.

The tobacco acreage in 1929 was 12,706 acres, and the production was 7,966,727 pounds. Cotton was grown on 4,762 acres and yielded 1,402 bales. These are the staple cash crops, and the economic welfare of the county depends largely on them. These crops are not perishable, have a ready sale for cash, and the acre returns are greater than for any other crops that could be grown under present economic conditions. The profitable production of the various crops, especially tobacco, cotton, peanuts, and truck crops, is owing to the fact that the soils and climate are especially favorable for their growth and the farmers understand handling them.

On some farms, special truck crops, including potatoes, sweetpotatoes, cabbage, English peas, string beans, radishes, asparagus, and beets, are grown in connection with other farm crops. The total value of truck crops in 1929 was $15,413.

Considered agriculturally the soils may be broadly classed in three groups as follows: (1) Light-colored well-drained soils, (2) light-colored poorly drained soils, and (3) dark-colored or black poorly drained soils and organic soils.

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

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

Type of soil	Acres	Percent	Type of soil	Acres	Percent
Norfolk fine sandy loam	9,088	2.0	Bladen loam	21,120	4.7
Norfolk fine sandy loam, deep phase	15,040	3.4	Bladen sandy loam	2,112	.5
Norfolk sandy loam	1,536	.3	Coxville very fine sandy loam	24,896	5.6
Norfolk sandy loam, deep phase	2,496	.6	Coxville clay loam	1,600	.4
Norfolk very fine sandy loam	4,480	1.0	Plummer fine sandy loam	2,944	.7
Norfolk sand	21,504	4.8	Leon sand	8,832	2.0
Norfolk fine sand	17,024	3.8	Portsmouth fine sandy loam	44,736	10.0
Craven fine sandy loam	33,280	7.3	Portsmouth fine sandy loam, swamp phase	5,952	1.3
Craven sandy loam	3,968	.9	Portsmouth sandy loam	4,352	1.0
Cuthbert fine sandy loam	6,016	1.4	Portsmouth loam	11,328	2.5
St. Lucie sand	320	.1	Hyde loam	1,600	.4
Dunbar fine sandy loam	14,592	3.3	St. Johns sand	3,072	.7
Dunbar sandy loam	7,104	1.6	Okenee loam	2,240	.5
Onslow fine sandy loam	23,808	5.3	Muck	36,608	8.2
Onslow sandy loam	9,280	2.1	Swamp	40,320	9.0
Lenoir very fine sandy loam	35,392	7.8	Marsh	4,160	.9
Lenoir fine sandy loam	7,168	1.6			
Bladen very fine sandy loam	18,496	4.1			
Bladen very fine sandy loam, deep phase	896	.2	Total	447,360	------

LIGHT-COLORED WELL-DRAINED SOILS

The first group, or the light-colored well-drained soils, may be termed the Norfolk group, and it includes all the soils of the Norfolk, Craven, Cuthbert, and St. Lucie series mapped. Although they cover only a little more than one fourth of the total area, these are the only naturally well drained soils in the county. They dominate the agriculture and produce the greater part of the cash crops. Their geographic position is well marked. They occur for the most part in the central and northwestern parts of the county and are confined principally to land bordering the first bottoms along Neuse and Trent Rivers and their larger tributaries, extending from the northwestern to the southeastern borders of the county. These soils occupy almost level, gently rolling, or undulating areas, and the surface relief, together with the texture and structure of both surface soil and subsoil, affords adequate drainage. All the soils of this group, because of their favorable surface relief, lie well for agricultural purposes and lend themselves admirably to the use of all kinds of farm machinery.

Soils of this group have light-gray or grayish-yellow surface soils ranging in texture from sand or fine sand to fine sandy loam and sandy loam. The subsoils range from yellow friable sandy clays or sands to reddish-yellow heavy clays, all of which are underlain by mottled yellow, light-red, and gray sandy clay material. These soils contain a very small quantity of organic matter, but they are mellow and friable and are very easy to cultivate. The subsoils are sufficiently friable to retain a large proportion of the rainfall, thus maintaining good moisture conditions for growing plants.

Because of the texture of the surface soils and the porousness and friability of the subsoils, these soils warm up early in the spring and are the first in the county on which agricultural operations begin. Although they are naturally low in the elements of plant food, their physical properties are so favorable that they respond

readily to fertilization and produce the most profitable crops of any soils in the county. All these soils are slightly acid and are benefited by small quantities of lime, especially where used for peanuts and other legumes.

These soils are rightly considered the best in the county for the production of bright tobacco, cotton, peanuts, and truck crops, In fact, practically all the tobacco produced is grown on them. The regard in which they are held by the farmers and landowners is attested by the fact that nearly all areas, except some of the sand and fine sand, are under cultivation.

Practically all the original longleaf pine or other tree growth has been cut. The present tree growth consists of loblolly pine, second-growth scrub pine, a few young longleaf pine, and a scattered growth of scrub oak, water oak, sweetgum, and dogwood.

Norfolk fine sandy loam.—Norfolk fine sandy loam is considered the best soil in this group and one of the best in the Coastal Plain region for the production of bright tobacco, cotton, and truck crops, such as English peas, beets, cabbage, and string beans. It is one of the most dependable soils in the county. The surface soil is mellow and friable, and the subsoil is sufficiently heavy to maintain good moisture conditions for growing crops. The soil also retains manures and fertilizers well. This soil, like Norfolk sandy loam and Norfolk very fine sandy loam, can be built up to a high state of productivity.

Norfolk fine sandy loam occurs in scattered areas in the northeastern and central parts of the county, mainly in close proximity to the drainage ways or swamp areas near Neuse River and along Swift and Little Swift Creeks. It is representative of the Norfolk group, except Norfolk sand and Norfolk fine sand.

The 4- to 6-inch surface layer of light-gray or yellowish-gray loamy fine sand is underlain by pale-yellow loamy fine sand. The subsoil, beginning between depths of 12 and 20 inches below the surface, is crumbly and friable yellow fine sandy clay. In most places, at a depth ranging from 30 to 36 inches, this material grades into mottled yellow, light-red, and gray fine sandy clay. In a few places where organic matter has been incorporated the surface soil is dark gray. On some of the slopes and ridges the subsoil is reddish-yellow or light-red friable fine sandy clay. On the flatter areas where drainage is poor, the subsoil below a depth of 30 inches is mottled with light gray.

Although this soil occupies only 9,088 acres, it is an important agricultural soil, practically all of it being under cultivation. From 30 to 40 percent of the land is devoted to the production of bright tobacco, and this is one of the important tobacco soils in the county. Tobacco yields range from 600 to 1,000 pounds an acre, and the fertilizer application of 3–8–3 or 3–8–5 grades ranges from 800 to 1,000 pounds an acre. Corn occupies about 40 percent of the land, and yields range from 25 to 30 bushels an acre, with fertilizer. About 20 percent of the land is devoted to cotton, yields of which range from one half to three fourths of a bale an acre, with fertilizer. A small acreage is used for truck crops, peanuts, sweetpotatoes, and home gardens.

176636—34——2

Norfolk fine sandy loam, deep phase.—The largest area of Norfolk fine sandy loam, deep phase, is in the vicinity of New Bern and south of Trent River. This soil occupies an ideal position for the growing and marketing of truck crops. It differs from the typical soil in that the fine sandy clay subsoil lies at a depth ranging from 20 to 30 inches below the surface and in that the surface layer and subsurface layer in most places are somewhat lighter in color and texture.

Soil of this phase is used for practically the same crops and is fertilized in a similar manner as typical Norfolk fine sandy loam, but crop yields are slightly less. The land is well suited to the production of asparagus and peanuts, and it also produces a good grade of bright tobacco. Because the deep loamy fine sand overlies the fine sandy clay, this soil is a little more difficult to build up to the same state of productivity as the fine sandy loam.

Norfolk sandy loam.—Norfolk sandy loam differs essentially from Norfolk fine sandy loam in the texture of the surface soil and also in the somewhat lighter texture of the sandy clay subsoil. This soil drains out more readily and warms up more quickly than the fine sandy loam, owing largely to the more open structure of both the surface soil and subsoil. It occurs in scattered areas in the northwestern part of the county. It occupies a relatively high position and is naturally well drained. About three fourths of the land is under cultivation, and the crops, fertilizer treatment, cultural methods, and yields of crops are about the same as on Norfolk fine sandy loam. This is considered one of the good soils of the county.

Norfolk sandy loam, deep phase.—Norfolk sandy loam, deep phase, differs from the typical soil mainly in that the open, loose sandy surface soil ranges from about 20 to 30 inches in thickness and in that it is underlain by a friable sandy clay subsoil. This deep soil is more extensive than the typical soil, and it occurs in fairly large areas in the vicinity of Fort Barnwell. Nearly all the land is under cultivation. The fertilizer treatment is practically the same as on Norfolk fine sandy loam, but crop yields are slightly less.

Norfolk very fine sandy loam.—Norfolk very fine sandy loam is the finest-textured and heaviest soil of the Norfolk group in Craven County. Because of its fine texture, it has a smooth velvety feel as compared to the sandy loam. The subsoil is firm but friable and brittle yellow heavy very fine sandy clay or clay loam. The surface soil, on account of the presence of a high percentage of very fine sand and silt, has a tendency to bake slightly and clod to some extent if not handled under proper moisture conditions. This soil does not warm up so early or drain out so quickly as the coarser Norfolk soils, and crops on it mature later.

Norfolk very fine sandy loam occurs in fairly large areas south of New Bern. About 40 percent of the land is farmed, and the crops grown, yields, and fertilizer treatment are practically the same as on Norfolk fine sandy loam. This soil is not quite so mellow and is not so easily tilled as the other Norfolk soils. It can be built up to and maintained in a fair state of productivity because the character of the subsoil is such as to retain manures and fertilizers and hold a large supply of moisture.

Norfolk sand.—Norfolk sand is the lightest-textured and most open, porous soil of the Norfolk group. It is exceptionally well drained, warms up 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. It has an undulating or gently sloping relief.

The surface soil under field conditions is light-gray or almost white sand. It is underlain at a depth of 5 or 6 inches by yellow or pale-yellow loose sand which extends to a depth ranging from 3 to more than 5 feet. In slight depressions, which occur in some places in the fields, the surface soil is dark gray. In wooded areas the upper 1- to 3-inch layer has a slight accumulation of organic matter, giving the material a brownish-gray color.

This is the most extensive Norfolk soil in the county. Large areas lie on the north side of Neuse River and on the east side of Swift Creek north of New Bern. Unbroken areas extend along Neuse River from New Bern to Maplecypress. Probably not more than 25 percent of the land is under cultivation, mainly to cotton, corn, and some tobacco. The fertilizer treatment is about the same as on Norfolk fine sandy loam, but crop yields are much lower. As fertilizer leaches readily from the soil, it is not advisable to apply all of it at one time. Part of this soil is best suited to the growing of old-field pine and loblolly pine.

Norfolk fine sand.—Large areas of Norfolk fine sand lie southwest of New Bern along Trent River, and south of Vanceboro. This soil occupies positions favorable for water transportation. Its nearness to towns, improved roads, and railroads gives it an advantage over Norfolk sand for the production of truck crops. Its fine texture and mellowness furnish good moisture conditions. The land is undulating or gently rolling.

Norfolk fine sand is similar in color to Norfolk sand, but it differs from that soil mainly in its finer texture, being mellow and mealy. About 50 percent of the land is cultivated, and the crops grown are tobacco, corn, and cotton, together with small quantities of truck crops. This soil, like Norfolk sand, is loose and porous, and fertilizers and manures are easily leached from it. The yields of the different crops depend largely on the quantity of fertilizer applied and also on the organic-matter content of the soil. Crop yields are less than on Norfolk fine sandy loam under similar treatment.

Craven fine sandy loam.—Craven fine sandy loam occurs in several large areas south and southeast of New Bern along Neuse River, extending to the eastern end of the county. It is associated with the Norfolk soils and Onslow soils, and in surface appearance it closely resembles Norfolk fine sandy loam.

The surface and subsurface layers are very similar to the corresponding layers of Norfolk fine sandy loam. The subsoil, beginning at a depth ranging from 12 to 20 inches, is brownish-yellow or yellow tough slightly plastic clay or fine sandy clay, which becomes mottled light-gray and brownish-yellow somewhat friable clay at a depth ranging from 24 to 30 inches. The main difference, therefore, between this soil and the Norfolk soil is in the heavy subsoil which does not drain out so well as the subsoil of the Norfolk soils. This

soil does not warm up so readily as the Norfolk soils. Because of these characteristics, Craven fine sandy loam is not quite so well suited to truck crops, but owing to the long growing season this condition does not affect the staple crops.

Approximately 50 percent of the land is cultivated, and a large acreage is held by lumber companies for forest reserve. About 40 percent of the cultivated land is in corn and soybeans, about 30 percent in tobacco, and 25 percent in cotton. Corn yields from 20 to 30 bushels an acre, tobacco from 600 to 1,000 pounds, and cotton from one half to three fourths of a bale. The fertilizer treatment is about the same as on Norfolk fine sandy loam.

Craven sandy loam.—Craven sandy loam differs from Craven fine sandy loam mainly in being slightly coarser in texture and a little more porous and open both in the surface soil and subsoil. Only a few small areas of this soil occur, mainly in the vicinity of Fort Barnwell. Nearly all the land is utilized for crops. About 30 percent is in tobacco, 40 percent in corn, and 25 percent in cotton. Crop yields and fertilizer treatment are similar to those on Norfolk fine sandy loam. This is considered a good cotton soil, and yields are as much as 1 bale an acre where the crop is heavily fertilized and not damaged by the boll weevil.

Cuthbert fine sandy loam.—Cuthbert fine sandy loam occurs in small areas in the west-central part of the county. It is confined to the so-called "breaks" or "slopes" bordering the swamps or some of the poorly drained soils. It has a redder subsoil than any other soil in the county, because oxidation is more thorough, owing to better drainage and aeration. This is the best-drained soil in the county, except, perhaps, Norfolk sand and Norfolk fine sand. The open, porous character of the surface soil, together with its undulating or rolling surface relief, insures adequate drainage for the surface layer, but the heavy subsoil prevents the quick downward movement of water.

The surface layer is light-gray loamy fine sand, and the subsurface layer is grayish-yellow loamy fine sand. The subsoil, beginning at a depth of about 10 or 12 inches, is reddish-brown or yellowish-red heavy tough clay which cracks and becomes very hard on drying. At a depth ranging from 18 to 24 inches the clay becomes intensely mottled with light red and gray, but it still retains the heavy texture and structure.

Because of its loamy fine-textured surface soil, Cuthbert fine sandy loam is easily tilled and warms up early in the spring. About 65 percent of the land is farmed and approximately 45 percent of this is used for corn, 30 percent for cotton, and 20 percent for tobacco. Crop yields are slightly less than on Norfolk fine sandy loam under similar fertilizer treatment.

St. Lucie sand.—St. Lucie sand occurs in a few small areas in the northwestern part of the county. This soil is extremely low in all plant-food elements and is unfit for farming under present economic conditions. It is very droughty, and organic matter and fertilizers are readily leached out of it. The first inch or two of the surface soil contains a very small amount of organic matter which gives the material a salt-and-pepper appearance. Below this is almost white loose incoherent sand, in many places resembling in general appearance, granulated sugar. St. Lucie sand can probably best be used for forestry. This sand is excellent for building purposes, and, owing to the fact that it consists of almost pure quartz, it is especially adapted for use in certain types of nutritional and cultural experiments in greenhouses.

LIGHT-COLORED POORLY DRAINED SOILS

The second group, or the light-colored poorly drained soils, may be termed the Coxville group. This group includes all soils of the Coxville, Dunbar, Lenoir, Onslow, Bladen, Leon, and Plummer series mapped in Craven County. These soils for the most part lie on broad smooth nearly level areas and occupy the next topographic belt inland from the Norfolk soils. Parts of the Lenoir, Dunbar, and Onslow soils occupy undulating or gently rolling areas. The large level areas, which have not been invaded to a great extent by natural drainage ways, require artificial drainage to render them suitable for agricultural use. In other words, they represent those broad comparatively high areas which retain, in a general way, the original constructional form of the land as it was raised from the sea.

These soils range in texture from sandy loams to very fine sandy loams and clay loams. With the exception of the Onslow, Leon, and Plummer soils, the subsoils of all these soils are heavy tough more or less mottled clays and plastic clays. They are all acid to greater or less extent. A number of extensive areas of the soils of this group occur on the borders of pocosons in the western, eastern, and southern parts of the county. The Dunbar soils are in the northern end of the county, and the Onslow soils are scattered in many small areas, mainly on the south side of Neuse River west of New Bern. The Lenoir soils occur in practically all sections except the southeastern part, and the Plummer soils occur as small scattered areas in different parts.

Probably not more than 5 or 6 percent of the total area of these soils is under cultivation. The main use of the cultivated areas is for the production of corn and soybeans. The better-drained areas of the Dunbar, Lenoir, and Onslow soils are used to some extent for tobacco, cotton, and peanuts. Very little of the Coxville, Bladen, and Plummer soils has been drained and cultivated. The Plummer and Leon soils are of low agricultural value, but the Coxville and Bladen soils would be productive if drained and reclaimed. From North Carolina to Florida, Bladen fine sandy loam and Bladen loam are recognized as the premier potato soils. They are also well adapted to the production of corn, soybeans, cowpeas, and sweetpotatoes. Even cotton does well on the more sandy areas where artificial drainage has been established. In the development of agriculture in Craven County, these soils offer excellent possibilities, but they require artificial drainage to render them suitable for farming operations. They contain a comparatively large amount of organic matter and are naturally acid, but this can be corrected by the application of a liberal quantity of lime. Probably more than 90 percent of the Bladen soils is forested or has been cut over.

The Coxville soils are poorly drained and are either forested to pine and gum or have been cut over. Only a few patches of the

very fine sandy loam are cultivated. When drained and reclaimed, these soils should produce fair yields of the staple crops.

The subsoils of all the soils of the group are similar in color and texture, being mottled or streaked heavy plastic sandy clays or clays. The principal differences in the soils are in the color, texture, and organic-matter content of the surface soils.

Cotton and tobacco are grown on some of these soils which are not especially suited to their production, because these crops meet the needs of the farmers for cash crops.

The principal forest growth on the soils of this group consists of loblolly pine and shortleaf pine, together with some sweetgum, black gum, and water, white, red, post, and scrub oaks. The undergrowth is mainly gall berry, reeds, and briers.

Dunbar fine sandy loam.—Dunbar fine sandy loam is perhaps the best-drained soil of the group. In surface relief it occupies an intermediate position between the well-drained Norfolk soils and the flat, poorly drained Coxville soils. Drainage is not nearly so good as in Norfolk sandy loam, nor can the land be cultivated so soon after rains. The soil warms up slowly in the spring, and crops are a few days later in starting on this soil than on the well-drained Norfolk soils. Dunbar fine sandy loam occurs in fairly large areas northeast of New Bern along the Pamlico County line, west of Fort Barnwell, near Honolulu, around Ernul, and north of Vanceboro.

The surface soil is mellow and friable light-gray loamy fine sand. The subsoil begins as mottled yellow and gray fine sandy clay which in most places at a depth ranging from about 18 to 24 inches is mottled with red. The fine sandy clay is much heavier in texture than the subsoil of Norfolk fine sandy loam but not quite so heavy as the subsoil of Coxville fine sandy loam. In wooded areas the 2- or 3-inch surface layer contains a small amount of organic matter, but this soon disappears with cultivation.

About 60 percent of Dunbar fine sandy loam is used for crops, corn occupying about 45 percent of the farmed area, cotton about 25 percent, and tobacco about 20 percent. Most of the tobacco is grown on the slightly higher ridges and better-drained areas. Some of the land is used for the production of sweetpotatoes, soybeans, and oats. Corn yields from 15 to 30 bushels an acre, cotton from one third to two thirds of a bale, and tobacco from 600 to 800 pounds. Fertilizers analyzing 3–8–3 or 3–8–5 are applied to tobacco land at the rate of 800 to 1,000 pounds an acre. Corn receives about 200 pounds an acre of 3–8–3 fertilizer and, on some farms, a side application of nitrate of soda. Cotton is fertilized with about 500 pounds an acre of a 3–8–3, 4–8–4, or 4–10–3 mixture.

Dunbar sandy loam.—Dunbar sandy loam occurs in fair-sized areas south and west of Fort Barnwell, around Dover, and northeast of Jasper. It differs mainly from Dunbar fine sandy loam in that it is coarser in texture and more granular in structure. Under the same surface relief, it drains out a little quicker and warms up a little earlier than the fine sandy loam. About 65 percent of the land is farmed, and the same kinds of crops are grown, the same yields are obtained, and the same fertilizer treatment is given as on Dunbar fine sandy loam.

Onslow fine sandy loam.—Onslow fine sandy loam has a light-gray or grayish-brown loamy fine sand or fine sandy loam surface layer from 4 to 6 inches thick. Beneath the surface layer in wooded areas is a dark-brown, compact, slightly cemented, sandy layer ranging in thickness from one fourth inch to more than an inch. Some farmers call this a hardpan. In plowed fields the brown material, with a few small brown soft concretions, is plowed up in places, but it does not occur in all fields, as much of it has probably been broken up and lost through continued cultivation. The subsoil is grayish-yellow friable clay loam or heavy fine sandy clay, mottled with brown or yellow in the lower part.

The surface relief is gently undulating or nearly level, and drainage ranges from fair to poor. This soil occurs in rather large scattered areas in the western and southern parts of the county west and south of New Bern, north of Havelock, in the vicinity of Pinegrove, and northeast of Cove. About 35 percent of the land is cultivated, mainly to corn, cotton, and tobacco, a small acreage being in potatoes, soybeans, cowpeas, and oats. About 45 percent of the farmed area is devoted to corn, 35 percent to cotton, and about 15 percent to tobacco. Crop yields and fertilizer treatment are about the same as for similar crops on Dunbar fine sandy loam.

Onslow sandy loam.—Onslow sandy loam occurs in the western part of the county north of and in the vicinity of Cove and northeast of Dover. About 60 percent of this soil is farmed, and the remainder is in forest or cut-over land. The crops grown and the yields obtained are practically the same as those on Onslow fine sandy loam. Onslow sandy loam is similar in color, surface relief, and drainage conditions to Onslow fine sandy loam, but the texture of both the surface soil and subsoil is coarser, and the material is slightly more friable. This soil drains out a little earlier in the spring and warms up a little quicker than the fine sandy loam.

Lenoir very fine sandy loam.—Lenoir very fine sandy loam occurs in the central and northern parts of the county. Large areas are northwest of New Bern, extending to Tuscarora and south of that place, and around Vanceboro. This soil occupies almost level or gently undulating areas. Natural surface drainage is poor, and open ditches are necessary to drain the land for agricultural use.

The surface soil is gray, light-gray, or yellowish-gray mellow very fine sandy loam extending to a depth ranging from 8 to 12 inches. The subsoil is brownish-yellow, mottled with light gray or brown, heavy tough compact clay or silty clay. Below a depth of 20 inches it is mottled light-gray, bluish-gray, and dull-yellow heavy stiff plastic clay. In some fields there are small areas in which the surface soil is shallow.

Because of its very fine texture, this soil is not worked so easily as the sandy Norfolk soils, and it has a tendency to bake and clod. Drainage ranges from fair to poor, and after heavy rains water stands on the ground in places because it cannot easily penetrate the heavy subsoil.

About 35 percent of the land is farmed and is used for corn, cotton, and tobacco, corn occupying about 45 percent of the farmed acreage, cotton about 35 percent, and tobacco about 15 percent. Crop yields compare favorably with those on Dunbar fine sandy

loam, and the fertilizer treatment for the different crops is about the same as on that soil.

Lenoir fine sandy loam.—Lenoir fine sandy loam is similar to Lenoir very fine sandy loam, except that the texture, or the size of the sand grains, is a little coarser. The depth of the surface soil and the structure of the subsoil are similar. This soil, on account of its more porous surface layer, is slightly better drained and is more easily worked than the very fine sandy loam. Its surface relief is slightly more undulating, and, as a rule, it occupies positions nearer the streams. About 60 percent of the land is farmed, and the crops, yields, and fertilizer treatment are about the same as on Dunbar fine sandy loam.

Bladen very fine sandy loam.—Bladen very fine sandy loam occurs in large areas east of Vanceboro, along the Pamlico County line, southeast of New Bern, and in the vicinity of Croatan.

The surface layer is gray or grayish-brown mellow and friable very fine sandy loam. The subsurface layer, beginning at a depth ranging from 3 to 5 inches, is light-gray very fine sandy loam faintly mottled with yellow or rust brown. The subsoil, which begins at a depth of 10 or 12 inches, is steel-gray or bluish-gray mottled with brownish-yellow heavy very fine sandy clay or plastic clay. When dry the material becomes hard and cracks, but when wet it is very plastic and sticky.

Only about 10 percent of this soil is used for agriculture, as it is so poorly drained. About 60 percent of the farmed land is planted to corn and 30 percent to cotton. Corn yields from 25 to 35 bushels an acre, cotton from one half to three fourths of a bale, potatoes from 60 to 90 barrels, and other crops give good returns. Corn and cotton are fertilized with about the same grades of fertilizer as are used on Dunbar fine sandy loam. Potatoes require a heavy application of high-grade fertilizer.

Bladen very fine sandy loam, deep phase.—Bladen very fine sandy loam, deep phase, differs from the typical soil in that it has a deeper and lighter-colored surface layer and in that it is a little better drained. It is used for the production of corn, cotton, hay, and soybeans.

The largest area is about 2 miles south of James City.

Bladen loam.—Bladen loam has a dark-gray or brown loam surface layer about 6 inches thick, underlain by light-gray loam containing brownish-yellow mottlings. The subsoil is similar to that underlying Bladen very fine sandy loam. In wooded areas an accumulation of leaf mold 1 or 2 inches thick occurs on the surface.

This soil occurs in large areas in the western, northeastern, and southern parts of the county. On account of the poor drainage, only a few small areas are used for crops. One fairly large body near Croatan was formerly used for corn and potatoes, and high yields are said to have been obtained. Corn, soybeans, and cotton are grown on the few areas now in use. Corn yields from 25 to 35 bushels an acre and cotton from one half to three fourths of a bale.

Bladen sandy loam.—Bladen sandy loam occurs southwest of Cove. Part of the land has been reclaimed by ditching and is used for corn and cotton. Yields are about the same as on Bladen loam.

The soil is more open and porous than Bladen very fine sandy loam, works more easily, and drains out more readily.

Coxville very fine sandy loam.—Coxville very fine sandy loam occurs in large continuous areas in the eastern and southern parts of the county. Some of the largest bodies are south of Clark, south of Tuscarora along the Jones County line, and in the eastern part north and south of New Haven Church.

The surface layer in wooded areas, to a depth ranging from 3 to 5 inches, is dark-gray very fine sandy loam containing a rather large amount of organic matter, but in cultivated fields it is ash gray or light gray. It is underlain by light-gray very fine sandy loam, with brown and yellow mottlings. The subsoil, which begins at a depth of about 10 inches, is light-gray heavy tough clay mottled with brownish yellow, and at a depth ranging from 24 to 30 inches it is very light gray heavy tough clay mottled with yellow and splotched with bright red. The bright-red spots are not everywhere present within a depth of 3 feet.

A few small areas of this soil are used for the production of cotton, corn, and soybeans.

Coxville clay loam.—Coxville clay loam is similar to Coxville very fine sandy loam except that the surface soil is heavier and shallower. A gray layer, about 1 inch thick, which contains some organic matter, covers the surface. Included with this soil as mapped are a few areas of Coxville silt loam, and in these the surface soil is not quite so heavy in texture.

Coxville clay loam occurs only in the northern part of the county, mainly near Vanceboro. The land is poorly drained, and practically all of it is in forest or cut-over land. Its best use is for forestry or pasture.

Plummer fine sandy loam.—Plummer fine sandy loam occurs in small areas in the northeastern and northern parts of the county. It differs essentially from the Coxville soils in that the subsoil is very friable, being a fine sandy clay consisting of lenses of clay intermixed with fine sand or sandy loam. The subsoil of Plummer fine sandy loam contains no red mottling, and in places at a depth ranging from 30 to 40 inches a light-gray creepy sand is present. The land is naturally poorly drained, and ditches are difficult to maintain in it, because the friable loose subsoil soon crumbles and caves, partly filling the ditches.

Plummer fine sandy loam is not an agricultural soil at present, and none of it is cultivated. Practically all the land is forested or has been cut over. The present growth consists of pine, sweetgum, black gum, water oak, and an undergrowth of gall-berry bushes, reeds, and coarse grasses. The best use of this soil is for forestry.

Leon sand.—Leon sand to a depth ranging from 3 to 5 inches consists of gray or dark-gray 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 15 to 20 inches, where it is underlain by a dark-brown or almost black hardpan composed of sand cemented with organic matter. The hardpan is from 4 to 8 inches thick and is underlain by grayish- or whitish-yellow creepy sand.

This soil occurs in the western part of the county northeast of Dover and northwest of Cove. Surface drainage is fairly good, but, on account of the underlying hardpan, the downward percolation of soil water is retarded. The land is nonagricultural and is best suited to forestry.

DARK-COLORED OR BLACK POORLY DRAINED SOILS AND ORGANIC SOILS

This group of soils is the most extensive in the county, but the soils are the least developed. It may be termed the Portsmouth group, and it includes soils of the Portsmouth, Hyde, St. Johns, and Okenee series, in addition to three types of miscellaneous materials. These soils occupy level or slightly depressed areas, in which natural drainage has not been established. The most common characteristic of the soils is the black color of the surface soils, caused by a large content of organic matter that has accumulated through the decay of vegetation for a long period of time when the land was in a swampy condition.

These soils are naturally strongly acid and require heavy applications of lime. They occur in practically all parts of the county and occupy flat level areas not yet invaded by streams. Extensive bodies of the Portsmouth soils occur in all parts of the county; the Okenee soils are mainly in the northwestern part on the terraces or second bottoms; and the Hyde soils are in the southern part. Only a very small percentage of these soils is under cultivation, owing to extremely poor drainage. The soils require artificial drainage to reclaim them for agricultural use, and such drainage can only be effected by district or community cooperation.

Hyde loam, Okenee loam, Portsmouth loam, and Portsmouth sandy loam produce large yields of corn. This is probably because of the large amount of organic matter present and the good moisture conditions, two important factors in corn production. The forest growth on the Portsmouth soils consists of loblolly and other pines, sweetgum, black gum, water oak, and maple, and the undergrowth is gall berry, myrtle, and bay.

The organic soil, mapped as muck, is in the southern end of the county, where it occupies 36,608 acres. The largest area of swamp occurs in a continuous belt along Neuse River. Marsh is mapped along Neuse River and some of its tributaries in the southern part of the county. In their present condition these classes of material are nonagricultural, and their value is determined by the quantity and character of the timber growth.

Portsmouth fine sandy loam.—Portsmouth fine sandy loam is the dominant Portsmouth soil in Craven County. It occurs in large continuous areas in the southern part bordering Lakes Pocoson, in the southern and southeastern parts, and in small areas in all parts. All the Portsmouth soils have black or dark-gray surface soils containing a large quantity of organic matter which gives them a mellow loamy feel. The subsoils are light-gray friable sandy clays or sands mottled with yellow or rust brown. They are much lighter in texture and more friable than the subsoils of the Coxville soils. Drainage is extremely poor, owing to the flat surface, and in places no natural stream ways have invaded these areas.

Not more than 5 percent of Portsmouth fine sandy loam has been reclaimed through drainage, and most of the cultivated land is in the northern part of the county. Corn is the principal crop, although some cotton, soybeans, and oats are produced. Corn yields from 25 to 40 bushels an acre, cotton from one half to three fourths of a bale, and soybeans and oats give good returns. This soil, as well as Portsmouth sandy loam and Portsmouth loam, is a good soil for corn, potatoes, cabbage, and soybeans.

Portsmouth fine sandy loam, swamp phase.—Portsmouth fine sandy loam, swamp phase, differs mainly from the typical soil in that it is much more poorly drained and has a higher content of decayed organic matter. The surface soil is thicker and more loamy than the surface soil of Portsmouth fine sandy loam. This soil occurs in a large area, known as Big Pocoson, along the Beaufort County line about 3 miles northeast of Ernul. The land is naturally poorly drained and is in a swampy or semiswampy condition the greater part of the winter and spring. If drained and reclaimed, it would produce good yields of corn, cabbage, and soybeans. However, in its present condition it is best suited to forestry.

Portsmouth sandy loam.—Portsmouth sandy loam occurs in small bodies, mainly in the northern and northwestern parts of the county. It occupies a much smaller acreage than Portsmouth fine sandy loam. It differs from the fine sandy loam in that it is coarser in texture and slightly more open and porous throughout both the surface soil and subsoil. Only a very small acreage of the land is cleared, and this is used principally for corn, although a small acreage is devoted to cotton, oats, and soybeans. The yields and the treatment on this soil are similar to those on Portsmouth fine sandy loam.

Portsmouth loam.—Portsmouth loam, like the other Portsmouth soils, is practically all forested. It occurs in large areas in the western part of the county, along the Norfolk Southern Railroad in the vicinity of Dover. Smaller bodies are in the east-central part and in the southern part south of Croatan. The loam differs from the fine sandy loam in having a slightly heavier textured surface soil, and the subsoil may be either heavier or lighter. The surface soil is mellow and loamy, owing to the large amount of decayed organic matter present. If the land were drained and limed, it would produce good yields of corn, cabbage, and soybeans. It occupies a high position and, although it is naturally poorly drained, it can be drained by means of canals and open ditches. Only a few small areas are cultivated.

Hyde loam.—Hyde loam differs mainly from Portsmouth loam in that the black loam surface soil ranges in thickness from about 18 to 30 inches. It is mellow and friable, contains a high percentage of well-decayed organic matter, and is easy to cultivate. The subsoil is gray or bluish-gray sandy clay or clay, in places slightly mottled or streaked with rust brown.

Hyde loam occurs only in the extreme southern part of the county southwest of Havelock. It is developed in slight depressions or low flat situations and is naturally poorly drained. It has been drained by means of canals and was at one time farmed, but at present it is not used for crops. There seems to be no reason why

it would not produce large yields of corn and soybeans if it were drained, limed, and properly handled, as a soil similar to this in other parts of the State has been successfully used for the production of these crops.

St. Johns sand.—St. Johns sand occurs mainly in the bays. It supports a growth of baybushes, gall berry, briers, and some pine. None of the land is cleared, drained, or farmed, and it is best suited for forestry. The surface soil is black or very dark gray sand containing a rather large quantity of organic matter. This material may extend to the hardpan layer, or it may be underlain by a subsurface layer of light-gray sand. The characteristic feature of this soil is the hardpan layer which occurs at a depth ranging from 15 to 30 inches below the surface and consists of a 4- to 8-inch dark-brown or black layer of sand cemented by organic matter. This layer is hard and brittle and does not allow the free downward flow of water, and the rise of soil water is also hindered. Below this layer is light-brown or grayish-blue sand, grading, within a few inches, into light-gray or almost white fine sand which is loose and when wet is very unstable. In places in areas of this soil, which, as mapped, includes small spots of Portsmouth fine sand, the hardpan layer has not developed. Ditch banks or walls of canals will not stand up well in St. Johns sand.

Okenee loam.—Okenee loam occurs in the northwestern part of the county and is developed on the second bottoms, or terraces. In surface appearance it resembles the Portsmouth or Hyde soils. It was originally poorly drained, but most of it has been ditched or canalled. It contains a large quantity of organic matter and is a mellow soil suitable for the production of corn and soybeans. It is one of the good agricultural soils of the county.

Muck.—Muck is composed of well-decomposed organic matter containing a very small proportion of mineral matter. The surface soil is black and extends to a depth ranging from 20 to 34 inches, where it is underlain by gray or brown fine sand. In a few places, near other soils, it is underlain by gray loamy sand or fine sandy clay. It is poorly drained, and the water table is at or only a few feet below the surface. When well dried out, the material will burn, and holes occur in places where it has been burned. Muck occurs mainly in one large area in the southwestern corner of the county, and smaller areas occur in other parts. In or near the border of the large area of muck, five lakes have been formed. Muck is not used for cultivated crops in Craven County.

Swamp.—The material classed as swamp consists of areas of first-bottom land lying along most of the streams. The largest and most continuous belt, ranging in width from one half to 1 mile, lies along Neuse River, extending from New Bern north to the county line. Other large areas occur along Swift, Fisher, and Little Swift Creeks, and small strips are along other streams.

Swamp is subject to overflow by the streams, and in places it is covered by water practically all the time or is in a partly saturated condition. It would be extremely difficult and expensive to drain and reclaim this land. The color, texture, and structure of the material classed as swamp has no uniformity, and most of it is probably black mucky material or dark-gray loam or sandy loam, underlain by gray fine sand or mottled yellow and gray sandy clay or clay.

Swamp can best be utilized for growing timber, although some of it could probably be drained sufficiently for use as pasture. The forest growth consists of gums, oaks, cypress, sycamore, birch, poplar, ash, and maple.

Marsh.—Marsh includes small areas of low flat marshy lands bordering Neuse River and some of its tributaries in the southern part of the county. Other areas are near the mouth of Trent River south of New Bern, along Neuse River north of New Bern, and occur as small islands in Neuse River.

The texture and structure of this material is not uniform, as it is mucky in some places and dark-gray loam in others. Marsh is underlain by mottled gray and yellow fairly heavy clay or silty clay. It is subject to flooding by the tides, especially wind tides. The water flooding this material is fresh or slightly brackish. None of the marsh areas have been reclaimed for agricultural purposes or farmed. The natural growth consists of coarse marsh grasses and bushes, which furnish slight grazing for cattle.

AGRICULTURAL METHODS AND MANAGEMENT

The North Carolina Agricultural Experiment Station has conducted field experiments on soils similar to those in Craven County and recommends for cotton on Norfolk fine sandy loam from 600 to 700 pounds an acre of a 4–8–4 fertilizer, supplemented by a side application ranging from 50 to 100 pounds of nitrate of soda or its equivalent of sulphate of ammonia immediately after chopping. On Lenoir very fine sandy loam, Portsmouth fine sandy loam, and Bladen very fine sandy loam about 600 pounds an acre of a 4–8–4 fertilizer is recommended, and on Onslow fine sandy loam from 600 to 700 pounds an acre of a 4–8–4 or 4–10–4 mixture.

The recommendation for corn on Norfolk fine sandy loam and Craven fine sandy loam is about 400 pounds an acre of a 4–8–4 or 4–6–4 fertilizer, supplemented by a side application ranging from 50 to 74 pounds an acre of nitrate of soda or its equivalent in sulphate of ammonia when the corn is about knee-high. If the corn has a good dark-green color, this application will not be necessary. For corn on Lenoir very fine sandy loam, Portsmouth fine sandy loam, Onslow fine sandy loam, and Bladen very fine sandy loam about 400 pounds an acre of a 4–8–4 fertilizer is suggested.

The fertilizer recommended for peanuts on Lenoir very fine sandy loam is from 300 to 400 pounds an acre of a 2–6–4 or a 2–8–4 grade; on Norfolk fine sandy loam, Craven fine sandy loam, and Onslow fine sandy loam, from 300 to 400 pounds an acre of a 2–8–4 grade; on Portsmouth fine sandy loam, from 300 to 400 pounds an acre of a 1½–8–4 grade; and on Bladen very fine sandy loam about 300 pounds an acre of a 1½–8–4 grade. Where lime has not been added recently, it is recommended that a broadcast application be made every 3 or 4 years, or its equivalent in small annual applications in the drill, to be mixed thoroughly with the soil before adding the fertilizer and planting.

For early potatoes on all these soils, the use of a fertilizer application ranging from 1,000 to 1,500 pounds an acre of a mixture an-

alyzing 5–7–5 is recommended. Not less than one fifth of the nitrogen contained in the mixture should be derived from some high-grade organic material like cottonseed meal, tankage, or fish scrap, and the remainder may be derived from sulphate of ammonia, nitrate of soda, or a mixture of the two. The potash should be derived mainly from muriate of potash or sulphate of potash, and it should never be entirely from a low-grade potash salt, such as kainit.

According to information furnished by the county farm agent, farmers are using on tobacco 3–8–3, 3–8–5, 4–8–6 grades of fertilizer, in which one half of the nitrogen is made up of mineral ingredients and the other half of organic ingredients.

The better farmers recognize that the Norfolk, Craven, Lenoir, Cuthbert, and Dunbar soils are deficient in organic matter. As very few cattle are kept, only a small quantity of barnyard manure is available, and the better farmers grow leguminous crops, such as soybeans, cowpeas, and vetch, to supply organic matter. According to the State experiment station, if these crops are turned under, the quantity of nitrogen in the fertilizers may be less than that given in the preceding recommendations.

The farmers recognize that the light sandy soils require breaking to only a slight depth and shallow cultivation, but it has been found that breaking the heavier soils to a depth of 6 or 8 inches is beneficial.

Drainage is probably the most essential factor in crop production in the county. Some of the more fertile lands, such as the Bladen, Coxville, and Portsmouth soils, are barred from the production of large crop yields by poor drainage. In a few localities canals have been dug, and small open ditches lead into them. This system of drainage is the best under existing conditions, because the heavy subsoils do not allow free passage of the rainfall through them and the only means of escape for the excess water is through open ditches. Much of the land used for crops does not have a free outlet for water during excessive rains, and the soils would be benefited by more extensive drainage.

The corn crop, whenever possible, is followed by tobacco which is followed by soybeans. Hairy vetch for winter use and soybeans for summer use are the principal legumes. Vetch is followed by corn or cotton and the fall crop of soybeans by grain. Hairy vetch or soybeans make the soil too rich for tobacco in most places, according to the experience of the best farmers, as only certain high-lying light soils are adapted to tobacco. On the darker heavier soils, crops are rotated, and legumes are planted with all crops whenever possible, in order to increase the productiveness.

All the soils unless they have been recently limed, are seriously in need of lime. With very acid soils, the extent to which fertilizer materials are effective depends largely on the quantity of lime present. In many fields that have not been limed, the crop yields are small, so that lime seems to be an important factor in crop production. The soils that probably are in greatest need of lime are the Dunbar, Lenoir, Onslow, Bladen, Coxville, Portsmouth, Hyde, and Okenee. Drainage in these soils ranges from fair to poor.

The best grass mixture consists of carpet grass, Lespedeza, and Dallis grass. A promising legume for all the soils is Korean Lespedeza.

Throughout the county are areas of soil, some very large, which under present conditions are probably best suited to forestry. These include poorly drained soils and some very sandy soils, such as Norfolk fine sand, Norfolk sand, Leon sand, Portsmouth fine sand, St. Johns sand, and St. Lucie sand. Large areas of Bladen, Coxville, and Portsmouth soils and smaller areas of Lenoir and Onslow soils are now forested. Forest fires are a menace to the successful production of timber. It is a practice in some sections to burn the undergrowth in the winter or early spring to prevent the spread of destructive fires in the summer. The forested sections are now under the supervision of the United States Forest Service. A lookout tower is located at Croatan, and two towers are contemplated for forested areas in other parts of the county.

For further information on agricultural methods and management, the State experiment station suggests the following bulletin and circulars:

For a discussion of crop rotation on Coastal Plain soils, Crop Rotations for the Coastal Plain Section of North Carolina (N.C. Agr. Col. Ext. Circ. 165); for information on the use of lime on the Coastal Plain soils, How to Use Lime on the Farm (N.C. Agr. Col. Expt. Sta. Bul. 262); for fertilizer recommendations for different crops on various soil types, Fertilizers Recommended for Important Crops of North Carolina (N.C. Agr. Col. Ext. Serv. Agron. Inform. Circs. 2, 35, and 60); for information on the value of legumes for soil improvement, Results of Soil Building Demonstrations in North Carolina (N.C. Agr. Col. Ext. Serv. Agron. Inform. Circs. 11, 66, 68, and 73); and for information on soil acidity, Soil Acidity and Lime for North Carolina Soils (N.C. Agr. Col. Ext. Serv. Agron. Inform. Circ. 4).

SOILS AND THEIR INTERPRETATION

Craven County lies in the seaward or flatwoods part of the Atlantic Coastal Plain, and the center of the county is about 40 miles from the Atlantic Ocean.

The soils may be broadly classed in two main groups, namely, well-drained soils and poorly drained soils. The group of well-drained soils includes all the soils of the Norfolk, Craven, Cuthbert, and St. Lucie series. These soils are light colored and light textured in the A horizons. The B horizons of the Norfolk soils are friable and crumbly, with no definite structural characteristics, and the B horizons of the Craven and Cuthbert soils are heavy tough clays.

The soils of the poorly drained group may be subdivided into two divisions, namely, the light-colored soils and dark-gray soils. The division of light-colored soils includes the Lenoir, Dunbar, Plummer, Leon, and Onslow soils. These soils have light-gray or gray A horizons, and the B horizons are composed of heavy tough clays or sandy clays. The Onslow, Leon, and St. Johns soils have a so-called brown hardpan layer which is a distinguishing characteristic.

The second division of the poorly drained soils (dark-gray soils) includes the Coxville, Bladen, Portsmouth, St. Johns, Hyde, and Okenee soils. The A horizons of the Coxville and Bladen soils are dark gray or brown, and the B horizons are heavy tough mottled

plastic clays. The most striking characteristic of the Portsmouth, Okenee, and Hyde soils is their black color which is caused by the presence of an extremely large quantity of organic matter.

In addition to these mineral soils, there are extensive areas of cumulose soil, or soil composed almost entirely of well-decomposed organic matter. Such areas are classed as muck.

The soils of the county have developed under a forest cover consisting mainly of pine, with a few hardwoods. The well-drained soils have had no opportunity in this region of heavy rainfall, warm temperature, and absence of lime to accumulate an appreciable amount of organic matter. The black soils, which are high in organic matter, have developed under swampy and semiswampy conditions, which have favored a heavy growth of vegetation, and the decay of this vegetation over a long period is responsible for the presence of the large amount of organic matter.

The soil-forming material which underlies the region consists of beds of heavy clays and sandy clays. The parent material is very much the same under the Coxville and Dunbar soils but it is slightly different under the Norfolk soils. Extensive areas still retain the original structure of the underlying clay. In other words, the extensive flat areas have not been invaded by stream channels, and natural drainage has not been established.

The aggregate area of mature or normally developed soils is comparatively small. The Norfolk soils, except the sands, are the only soils in the county that have developed a normal soil profile. In these soils the A horizon is light textured, showing evidence of considerable eluviation. The B horizon is much heavier than the A horizon, is uniform in color, and maintains a definite consistence. It is the illuviated horizon. The C horizon is variable in color, texture, and consistence, and it is lighter in texture than the B horizon but heavier than the A horizon.

Approximately 90 percent of the soils in the county do not have a normally developed soil profile. This condition is directly caused by imperfect drainage which has impeded the forces of weathering and prevented the normal development of the soils. The various stages of soil development, constituting an ascending series from the youngest to the most mature, are shown by marsh, Bladen, Coxville, Dunbar, Craven, and Norfolk soils.

For a definite knowledge of the soils, profile descriptions are given for the normally developed soils and also for large and important areas of other soils.

A profile description of Norfolk fine sandy loam as observed in an area of virgin soil 3 miles southeast of Vanceboro, is as follows:

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

Horizon A_2. 4 to 14 inches, grayish-yellow loamy fine sand. These two layers constitute the eluviated A horizon, the A_2 layer being decidedly leached.

Horizon B. 14 to 38 inches, friable and crumbly yellow fine sandy clay which has no definite structural characteristics but crumbles readily into a fine mass. The material shows a uniform yellow color, and a cut surface is yellow. Occasional root holes are filled with light-gray material from the A horizon. This is the illuviated layer.

Horizon C. 38 to 48+ inches, light-yellow, mottled with light gray and light red, friable fine sandy clay material which is lighter in texture than the B horizon.

Following is a profile description of Lenoir very fine sandy loam as observed in an area of virgin soil 1 mile north of Riverdale:

Horizon A_1. 0 to 4 inches, gray very fine sandy loam containing a small quantity of organic matter and many grass roots.

Horizon A_2. 4 to 11 inches, pale yellowish-gray or light-gray very fine sandy loam. Both the A_1 and A_2 layers are mellow and friable.

Horizon B_1. 11 to 26 inches, mottled brownish-yellow and light-gray heavy tough clay.

Horizon B_2. 26 to 54+ inches, bluish-gray, mottled with brownish-yellow and faint specks of brownish-red heavy tough slightly plastic clay. Both the B layers break into irregular lumps, the outsides of which present a slimy appearance. The coating along breakage lines is light gray.

A profile description of Onslow fine sandy loam, as observed in an area of virgin soil 1 mile south of Pinegrove, follows:

Horizon A. 0 to 4 inches, gray loamy fine sand containing considerable organic matter and grass roots.

Horizon B_1. 4 to 9 inches, a dark-brown compact slightly cemented sandy layer, locally called hardpan, which contains rounded light-brown aggregates.

Horizon B_2. 9 to 26 inches, grayish-yellow friable and crumbly clay loam.

Horizon C. 26 to 40+ inches, mottled light-gray, brownish-yellow, and light-red heavy tough plastic clay having no definite structure. A black coating of organic matter is seen along some cleavage lines.

Following is a profile description of Bladen loam as observed in an area of virgin soil one half mile southeast of Croatan:

Horizon A_1. 0 to 1 inch, dark-brown leaf mold, with a small amount of mineral matter.

Horizon A_2. 1 to 6 inches, brownish-gray loam containing a large amount of organic matter and many fine roots.

Horizon A_3. 6 to 12 inches, light-gray loam with brownish-yellow mottlings. This layer grades through heavy plastic sandy clay into the B horizon.

Horizon B. 12 to 60+ inches, steel-gray, streaked and mottled with brownish yellow, heavy and rather plastic clay which breaks into blocky fragments. The outsides of the fragments have a coating of gray material, giving them a shiny appearance, and the interiors are brownish yellow.

A description of the profile of Coxville very fine sandy loam, as observed in an area of virgin soil 2½ miles north of Rhems, follows:

Horizon A_1. 0 to 4 inches, dark-gray very fine sandy loam containing a very large quantity of organic matter and fine roots.

Horizon A_2. 4 to 10 inches, light-gray very fine sandy loam containing yellow and brown mottlings.

Horizon B_1. 10 to 24 inches, light-gray heavy tough clay, with brownish-yellow mottlings.

Horizon B_2. 24 to 40+ inches, very light gray heavy tough clay, containing yellow mottlings and bright-red splotches, which breaks into irregular lumps. The gray color predominates along the cleavage planes, but between breakage planes gray material from the layers above has infiltrated and in places fills root holes.

The Craven soils are similar in the A horizon to the Norfolk soils, but the B horizon is much heavier and thinner, and beneath this a mottled heavy clay layer occurs. The Cuthbert soils are characterized by their red color and a heavy tough B horizon which is the most thoroughly oxidized and most highly colored B horizon in the county. The Dunbar soils represent an intermediate stage of development between the Coxville soils and the Norfolk soils. The

Plummer soils are like the Coxville soils, except that the subsoil, or B horizon, is very friable.

The Portsmouth, Okenee, and Hyde soils comprise the black soils which are highly charged with organic matter. The Portsmouth soils have gray and mottled yellow and rust-brown B horizons, but in the Hyde and Okenee soils the black structureless material may extend to a depth ranging from 3 to 5 feet.

The Leon and St. Johns soils constitute a group of sands in which a brown hardpan layer is developed at a depth ranging from 12 to 30 inches below the surface. Beneath this layer is white sand stained with brown, and this, in turn, grades into white sand. The Leon soils have light-colored surface soils, whereas the surface soils of the St. Johns soils are black. In close geographic relation to these soils are the St. Lucie soils which are composed of white incoherent sand extending to a depth ranging from 3 to 5 feet or deeper.

In addition to the recognized soil series and types mapped in Craven County, there are extensive areas of muck in some of the pocosons, and continuous and broad areas of swamp occur in first bottoms along creeks and rivers. Bordering Neuse River and a few of its larger tributaries in the southern part of the county are small areas of marsh.

SUMMARY

Craven County is in the eastern part of North Carolina, the southern boundary being about 15 miles from the Atlantic Ocean and the extreme western boundary about 100 miles from Raleigh. The general surface relief is that of a gently rolling broad nearly level plain. The more gently rolling parts occur near the swamp areas along Neuse River and along Swift and Taylor Creeks, and they have adequate surface and internal drainage, but in the large flat areas natural drainage has not been established.

Railroad facilities are good. Several paved State highways cross the county, and in addition to these roads some of the county roads are improved.

Only about one seventh of the land area is farmed, and the remainder consists of cut-over land or of second-growth forest and brush land.

The climate is mild and pleasant during the greater part of the year. The rainfall is ample and is well distributed throughout the growing season. A large variety of truck crops can be grown in early spring, and some of the more hardy vegetables can be grown during the winter.

The agriculture consists mainly of the production of corn, tobacco, and cotton, the last two being cash crops. Some oats, sweetpotatoes, cowpeas, and soybeans are grown. Truck crops, such as potatoes, cabbage, tomatoes, and string beans, are produced to some extent. Hog raising on a commercial basis was begun in 1926, and this industry has increased rapidly.

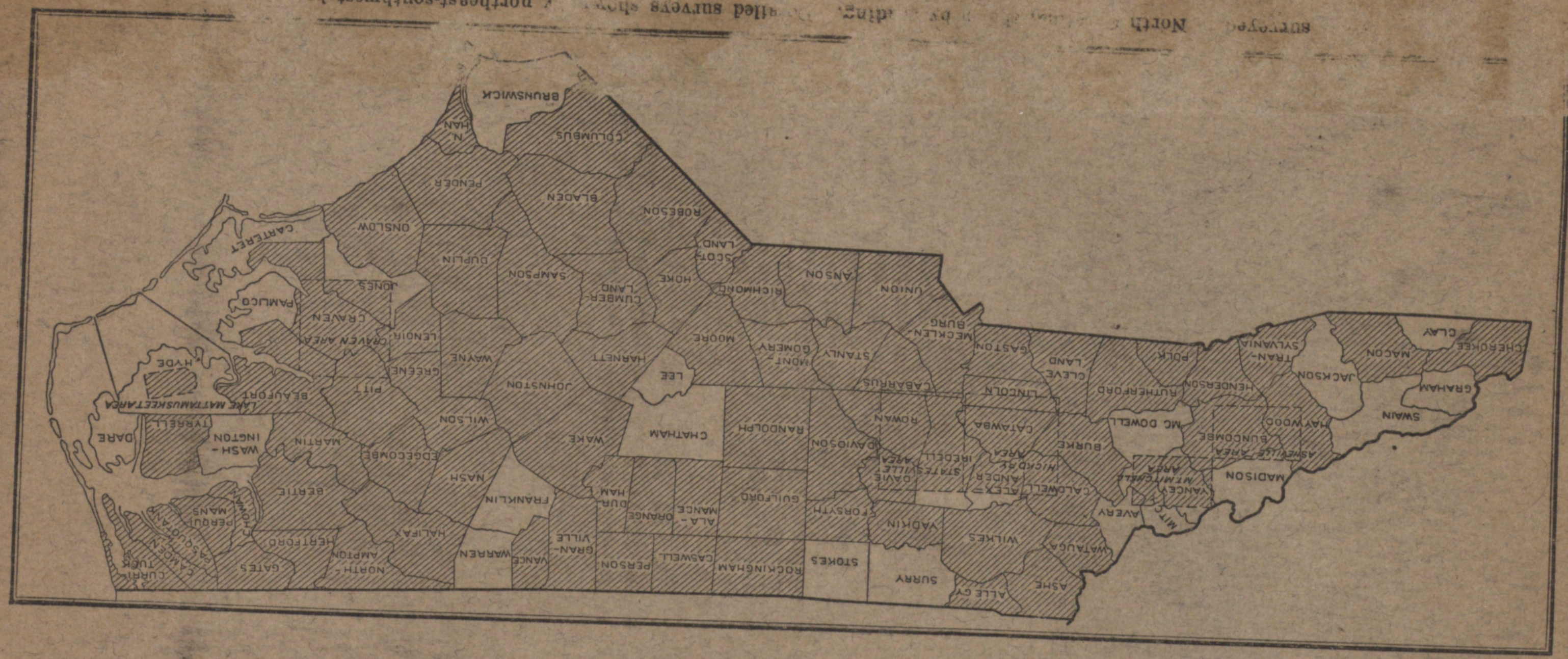
The principal agricultural soils are the Norfolk, Craven, Dunbar, Lenoir, Cuthbert, and Onslow soils, and most of the agricultural products are grown on these soils. These soils are well or fairly well

drained. They are not the most fertile, but they are the best-drained soils in the county. Extensive areas of Bladen, Coxville, and Portsmouth soils are undeveloped, mainly on account of inadequate drainage. Some of these soils are the most fertile in the county, but their development depends on artificial drainage by means of canals and lateral ditches.

Craven County offers inducements to home seekers and settlers because of its large areas of cheap undeveloped land, favorable climate, and good transportation facilities.

O

Authority for printing soil survey reports in this form is carried in Public Act. No. 269, Seventy-second Congress, second session, making appropriations for the Department of Agriculture, 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.

surveyed North [illegible] ding [illegible] lled surveys [illegible] northeast-southwest [illegible]