SOIL SURVEY OF

Robeson County, North Carolina

United States Department of Agriculture
Soil Conservation Service
in cooperation with
North Carolina Agricultural Experiment Station
and the
Robeson County Board of Commissioners

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all who need the information, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in the period 1966–71. Soil names and descriptions were approved in 1972. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1971. This survey was made cooperatively by the Soil Conservation Service, the North Carolina Agricultural Experiment Station, and the Robeson County Board of Commissioners. It is part of the technical assistance furnished to the Robeson Soil and Water Conservation District.

Soil maps in this survey may be copied without permission, but any enlargement of these maps could cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms, woodlands, and wildlife areas; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of Robeson County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is num-

ity. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of the capability units and woodland groups.

Foresters and others can refer to the section "Use of the Soils for Woodland," where the soils of the county are grouped according to

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Use and Management for Crops and Pasture

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SOIL SURVEY OF ROBESON COUNTY, NORTH CAROLINA

BY CLIFFORD M. McCACHREN, SOIL CONSERVATION SERVICE

SOILS SURVEYED BY ROBERT E. HORTON, ARLIN WEAVER, DANIEL G. SPANGLER, AND CLIFFORD M. McCACHREN [1]

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION AND THE ROBESON COUNTY BOARD OF COMMISSIONERS

ROBESON COUNTY is on the Coastal Plain in the southeastern part of North Carolina (fig. 1). It covers 607,104 acres and is the second largest county in the State. Lumberton, the county seat, is on the banks of the Lumber River, just east of the center of the county. Lumberton and Fairmont, in the southern part of the county, are major tobacco-market centers of the North and South Carolina Border Belt area.

Robeson County is mainly a farming county. Of the total acreage, 345,725 acres, or 58 percent, is in farm tracts. Of the acreage in farms, 107,383 acres, about 30 percent of the land, is in woods, and 153,227 acres, about 45 percent, is in harvested crops. About 45 percent of the acreage in harvested crops is corn, 23 percent is soybeans, 15 percent is cotton, 12 percent is tobacco, and 5 percent is other crops. Tobacco brings in about three-fourths of the total income from farm crops (*7*).[2]

The soils of Robeson County are nearly level to sloping and are well suited to farming. Generally, the well-drained soils occupy broad outer rims of the interstream divides next to the drainageways, and the more poorly drained, nearly level soils are farther from the drainageways, on the flood plains of streams, and in Carolina bays.

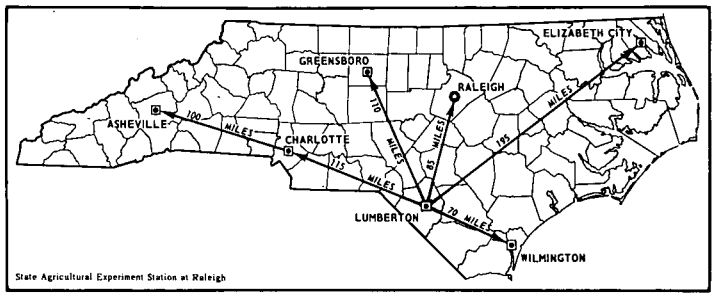

Figure 1.—Location of Robeson County in North Carolina.

The soils are generally acid and are low in natural fertility and organic-matter content. Lime and fertilizer should be applied according to the results of soil tests. Among good management practices generally are drainage or irrigation, if needed, crop rotation, fertilization, and conservation of plant residue.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soils are in Robeson County, where they are located, and how they can be used. The soil scientists went into the county knowing they likely would find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes, the size and speed of streams, the kinds of native plants or crops, the kinds of rock, and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Byars and Norfolk, for example, are the

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[2] Italic numbers in parentheses refer to Literature Cited, page 66.

names of two soil series. All the soils in the United States having the same series name are essentially

high water table. They see that streets, road pavements, and foundations for houses are cracked on a

mottled brownish-yellow, pale-brown, yellowish-red, and gray sandy clay loam in the lower part.

Wagram soils are well drained. The surface layer is dark grayish-brown loamy sand. The subsurface layer is light yellowish-brown loamy sand. The subsoil is yellowish-brown sandy loam and sandy clay loam in the upper part and yellowish-brown and pale-brown sandy loam in the lower part.

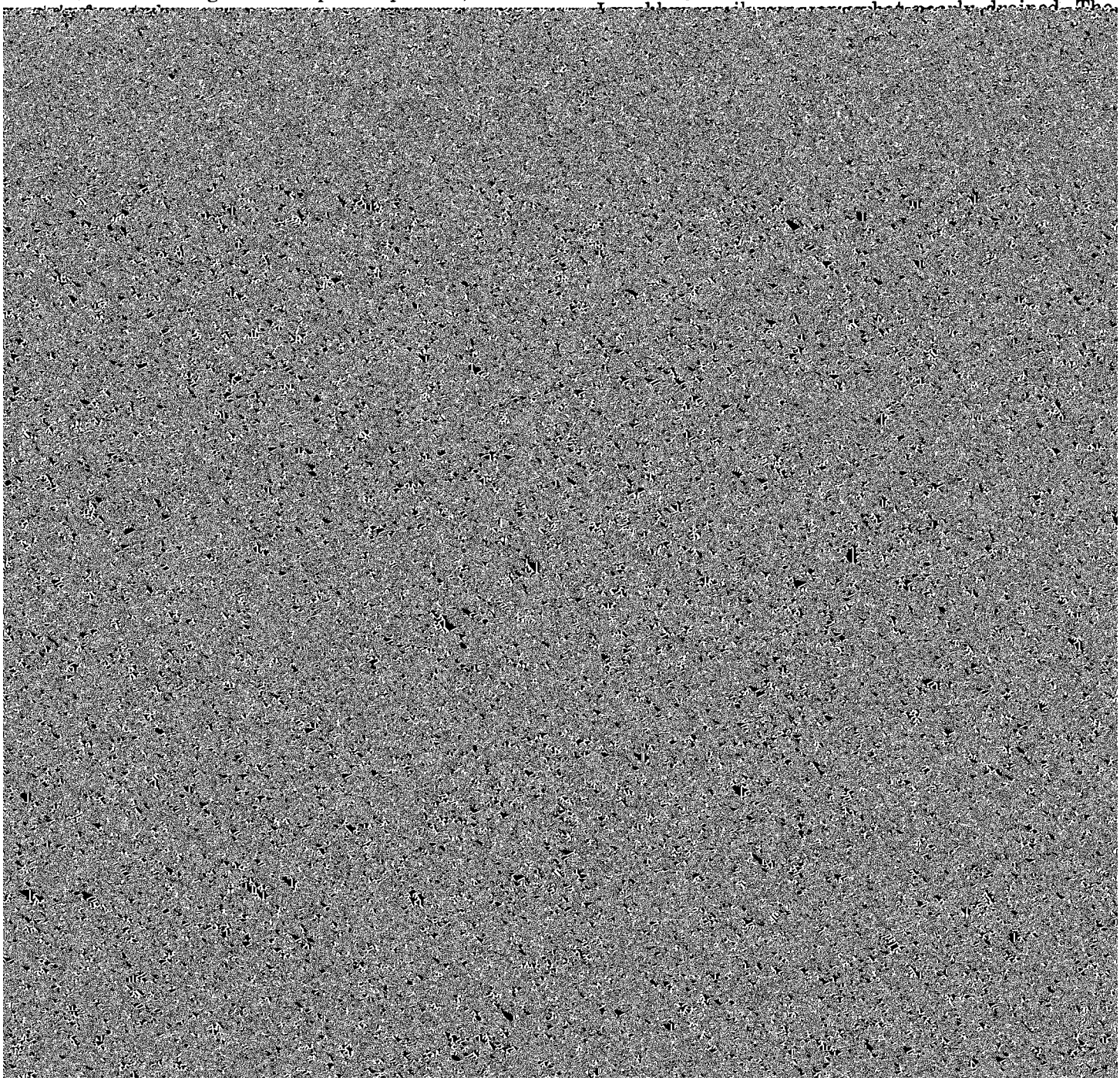
McColl soils are poorly drained. The surface layer is dark-gray loam. The subsoil is light-gray sandy clay in the upper part and strong-brown sandy clay loam in the lower part.

Most of the acreage is in crops and pasture, and the

This association is on broad upland flats, large, irregularly shaped depressions, oval and irregularly shaped bays, and interstream areas.

This association makes up 18 percent of the county. It is about 29 percent Rains soils, 25 percent Lynchburg soils, and 15 percent Goldsboro soils. Minor soils make up 31 percent of the association. They are Norfolk, Wagram, Coxville, and Pantego soils.

Rains soils are poorly drained. The surface layer is black sandy loam. The subsurface layer is grayish-brown sandy loam. The subsoil is sandy clay loam that is gray and light brownish gray in the upper part and gray and light gray in the lower part.



5. *Johns-Lumbee association*

Moderately well drained to poorly drained, nearly level soils that have a loamy subsoil; on stream terraces

This association is on fairly broad stream terraces.

This association makes up 8 percent of the county. It is 31 percent Johns soils and 30 percent Lumbee soils. Minor soils make up 39 percent of the association. They are Kalmia, Portsmouth, Pactolus, Bibb, and Johnston soils.

Johns soils are moderately well drained and somewhat poorly drained. The surface layer is dark-gray sandy loam. The subsoil is yellowish-brown sandy clay loam in the upper part, grayish-brown sandy clay loam in the middle part, and gray sandy loam in the lower part.

Lumbee soils are poorly drained. The surface layer is dark-gray sandy loam. The subsoil is gray sandy loam and sandy clay loam.

Most of the acreage is in crops or pasture. The rest is forested.

The major soils are fairly well suited to locally grown crops if they are drained. The main crops are corn, cotton, tobacco, soybeans, forage crops, and truck crops.

Bibb soils are poorly drained. The surface layer is dark-gray sandy loam. The underlying material is stratified, dark-gray sandy loam, gray loamy sand, and gray sand.

Most of the acreage is in native hardwoods and in pine, cypress, and juniper. A small acreage is in crops or pasture.

If they are drained, the major soils are fairly well suited to a few locally grown crops. The main crops are corn, soybeans, and grasses.

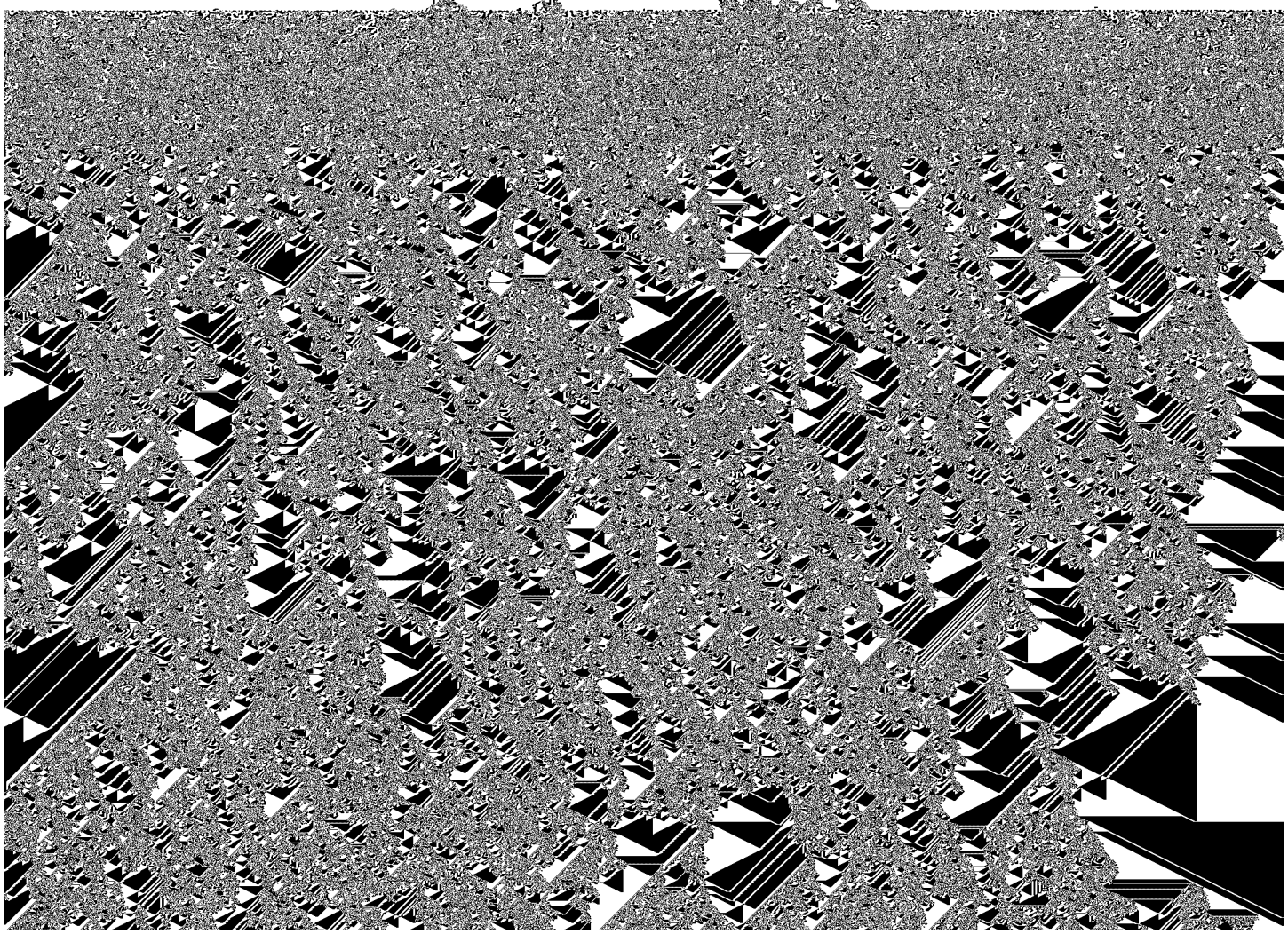
A seasonal high water table, moderately rapid permeability, and flooding are some of the limitations in the use and management of the soils.

7. *Norfolk-Rains-Goldsboro association*

Well-drained to poorly drained, nearly level and gently sloping soils that have a loamy subsoil; on uplands

This association is on broad ridges, broad flats, and irregularly shaped or oval depressions on uplands.

This association makes up 35 percent of the county. It is 20 percent Norfolk soils, 18 percent Rains soils, and 14 percent Goldsboro soils. Minor soils make up 48 percent of this association. They are Wagram, Coxville, Lynchburg, Dunbar, Duplin, Marlboro, Lakeland, and Pocalla soils.



necessary to read both the description of the mapping unit and the description of the soil series to which it belongs.

An important part of the description of each soil series is the soil profile, that is, the sequence of layers from the surface downward to rock or other underlying material. Each series contains two descriptions of this profile. The first is brief and in terms familiar to the layman. The second is much more detailed and is for those who need to make thorough and precise studies of soils. Color terms are for moist soil unless stated otherwise. The profile described in the soil series is representative for mapping units in that series. If a given mapping unit has a profile in some ways different from the one described in the series, these differences are stated in the description of the mapping unit, or they are apparent in the name of the mapping unit. The description of each mapping unit contains suggestions on how the soil can be managed.

As mentioned in the section "How This Survey Was Made," not all mapping units are members of a soil series. Udorthents, loamy, for example, does not belong to a soil series, nevertheless it is listed in alphabetic order along with the soil series.

Preceding the name of each mapping unit is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of each

TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soil	Acres	Percent
Aycock very fine sandy loam, 0 to 2 percent slopes	10,928	1.80
Aycock very fine sandy loam, 2 to 6 percent slopes	1,457	.24
Bibb soils	22,464	3.70
Byars loam	3,157	.52
Coxville loam	31,934	5.26
Dunbar sandy loam	5,585	.92
Duplin sandy loam, 0 to 2 percent slopes	5,221	.86
Duplin sandy loam, 2 to 6 percent slopes	728	.12
Exum very fine sandy loam, 0 to 1 percent slopes	5,646	.93
Faceville fine sandy loam, 0 to 2 percent slopes	668	.11
Faceville fine sandy loam, 2 to 6 percent slopes	3,036	.50
Goldsboro loamy sand, 0 to 2 percent slopes	46,444	7.65
Johns sandy loam	15,359	2.53
Johnston soils	74,674	12.30
Kalmia loamy sand, 0 to 2 percent slopes	2,307	.38
Lakeland sand, 0 to 6 percent slopes	9,107	1.50
Leon sand	2,498	.41
Lumbee sandy loam	19,609	3.23
Lynchburg sandy loam	30,901	5.09
Marlboro sandy loam, 0 to 2 percent		

in the lower part; slightly acid; abrupt, smooth boundary.

B21t—7 to 38 inches, yellowish-brown (10YR 5/6) clay loam; weak, medium, subangular blocky structure; friable, sticky and plastic; fine and medium fibrous roots; few patchy clay films on faces of peds and in pores; few, medium, hard, red (2.5YR 4/6) iron concretions; strongly acid; clear, smooth boundary.

B22t—38 to 48 inches, brownish-yellow (10YR 6/6) loam; common, medium, distinct, yellowish-red (5YR 4/8)

serve soil and water. Capability unit IIe-1; woodland group 2o1.

AyB—Aycock very fine sandy loam, 2 to 6 percent slopes. This well-drained soil is between nearly level soils and soils in drainageways or depressions. Most mapped areas cover 5 to 50 acres.

Included with this soil in mapping are a few small areas of soils that have a surface layer of fine sandy loam and silt loam. Also included are small areas of

is dark-gray, gray, or light-gray stratified loamy sand, sandy loam, or loam. Below that depth it is sand.

BB—Bibb soils. These nearly level, poorly drained soils are on the flood plains of natural drainageways. The surface layer is sandy loam, loamy sand, or loam. Most mapped areas are narrow and long; in some places they extend for several miles along a stream.

The composition of this mapping unit is more variable and areas are generally larger than those of most other units in the county. Mapping has been controlled well enough, however, to make interpretations for the anticipated uses of the soils.

Included with these soils in mapping are a few areas of soils that have a black surface layer that is less than 12 inches thick. Also included are a few small areas of better drained soils on slightly elevated, narrow strips.

Wetness is a very severe limitation if the soils are not drained. If drained, the soils are suited to a few locally grown crops, mainly corn, soybeans, and grasses.

These soils have good tilth and can be worked within a wide range of moisture content. Tillage operations, however, are delayed in wet seasons. Minimum tillage and crop residue management help to maintain the tilth and organic-matter content.

A seasonal high water table, moderately rapid permeability, and flooding are the main limitations in the use and management of these soils. Drainage is needed for most uses. Capability unit IIIw–1 where the soils are occasionally flooded, Vw–1 where the soils are frequently flooded; woodland group 2w9.

Byars Series

The Byars series consists of nearly level, very poorly drained soils in depressions and bays on uplands.

In a representative profile the surface layer is black loam about 12 inches thick. The subsoil extends to a depth of 64 inches. It is dark-gray clay loam in the upper 3 inches and gray clay below. It is mottled with yellowish brown below a depth of 50 inches.

Byars soils are medium in natural fertility and organic matter content. Permeability is slow, the avail-

and plastic; few medium and fine roots; shiny faces on peds; very strongly acid; gradual, wavy boundary.

B22tg—36 to 50 inches, gray (10YR 6/1) clay; weak, fine, angular blocky structure; firm, plastic and sticky; shiny faces on peds; very strongly acid; gradual, wavy boundary.

B3g—50 to 64 inches, gray (10YR 5/1) clay; few, fine distinct, yellowish-brown mottles; weak, fine, angular blocky structure; firm, plastic and sticky; very strongly acid.

The solum is 60 to 74 inches thick. The soils are very strongly acid throughout unless they have been limed. The A1 horizon is black or very dark gray. The B2t horizon is very dark gray, dark gray, gray, or light gray and is clay loam, silty clay loam, or clay.

By—Byars loam. This nearly level, very poorly drained soil is in low depressions or in bays. Most mapped areas cover 8 to 700 acres.

Included with this soil in mapping are some small areas that have a surface layer of mucky loam. Also included are small areas of Coxville, Pantego, and Trebloc soils and some small areas of soils that have less than 30 percent silt in the subsoil.

Wetness is a very severe limitation in winter and spring. The soil is suited to a few locally grown crops if it is drained. The main crops are soybeans, corn, fescue, ladino clover, and truck crops, such as snap beans, tomatoes, cucumbers, sweet potatoes, and onions.

Minimum tillage and crop residue management help to maintain the organic-matter content. Tillage operations, however, are delayed in wet seasons.

A seasonal high water table, high shrink-swell potential, slow permeability, and ponding are the main limitations in the use and management of this soil. Drainage is needed for most uses, but there are few suitable outlets. Capability unit IVw–2; woodland group 2w9.

Coxville Series

The Coxville series consists of nearly level, poorly drained soils on broad flats or in bays on uplands.

In a representative profile the surface layer is black loam about 8 inches thick. The subsoil is 56 inches thick. It is gray sandy clay loam that has pale-brown

B1g—8 to 12 inches gray (10YR 5/1) sandy clay loam; few, medium, faint, pale-brown (10YR 6/3) mottles; weak, medium, subangular blocky structure; friable, slightly sticky and slightly plastic; common medium roots and pores; old root channels are filled with material from the Ap horizon, and some material from the Ap horizon is mixed with this horizon; strongly acid; clear, smooth boundary.

B21tg—12 to 20 inches, gray (10YR 5/1) clay loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles and few, fine, distinct, strong-brown mottles; weak, medium, subangular blocky structure; firm; common fine roots; root channels filled with material from the Ap horizon; common medium and large pores; few discontinuous clay films on faces of peds; strongly acid; clear, smooth boundary.

B22tg—20 to 64 inches, gray (10YR 5/1) clay; few pockets of sandy loam and sandy clay loam; common, coarse, prominent, red (10YR 5/8) mottles and common, medium, prominent, dark yellowish-brown (10YR 4/4) and strong-brown (7.5YR 5/6) mottles; weak, medium and coarse, subangular blocky structure; firm, sticky and plastic; few fine roots; common medium pores; medium discontinuous clay brown clay loam. In the middle 28 inches, it is grayish-brown fine sandy clay and gray sandy clay that has mottles in shades of brown and red. In the lower 20 inches, it is light-gray sandy clay that has mottles in shades of brown and red. The underlying material, to a depth of 92 inches, is light-gray sandy clay.

Dunbar soils are medium in natural fertility and organic-matter content. Permeability is moderately slow, the available water capacity is medium, and the shrink-swell potential is moderate. The seasonal high water table is about 1 to 1½ feet below the surface from November through May.

Most of the acreage is in crops and pasture. The rest is forested.

A representative profile of Dunbar sandy loam, in a cleared field 4 miles southeast of Red Springs on State Highway 211, one-fourth of a mile northeast of State Road 1507, and 40 feet south of road:

Ap—0 to 8 inches, dark-gray (10YR 4/1) sandy loam;

soils that have a surface layer of fine sandy loam or loam. Also included are small areas of Coxville, Duplin, Lynchburg, Rains, and Trebloc soils and some small areas of soils that have a subsoil of sandy clay that extends to a depth of less than 60 inches.

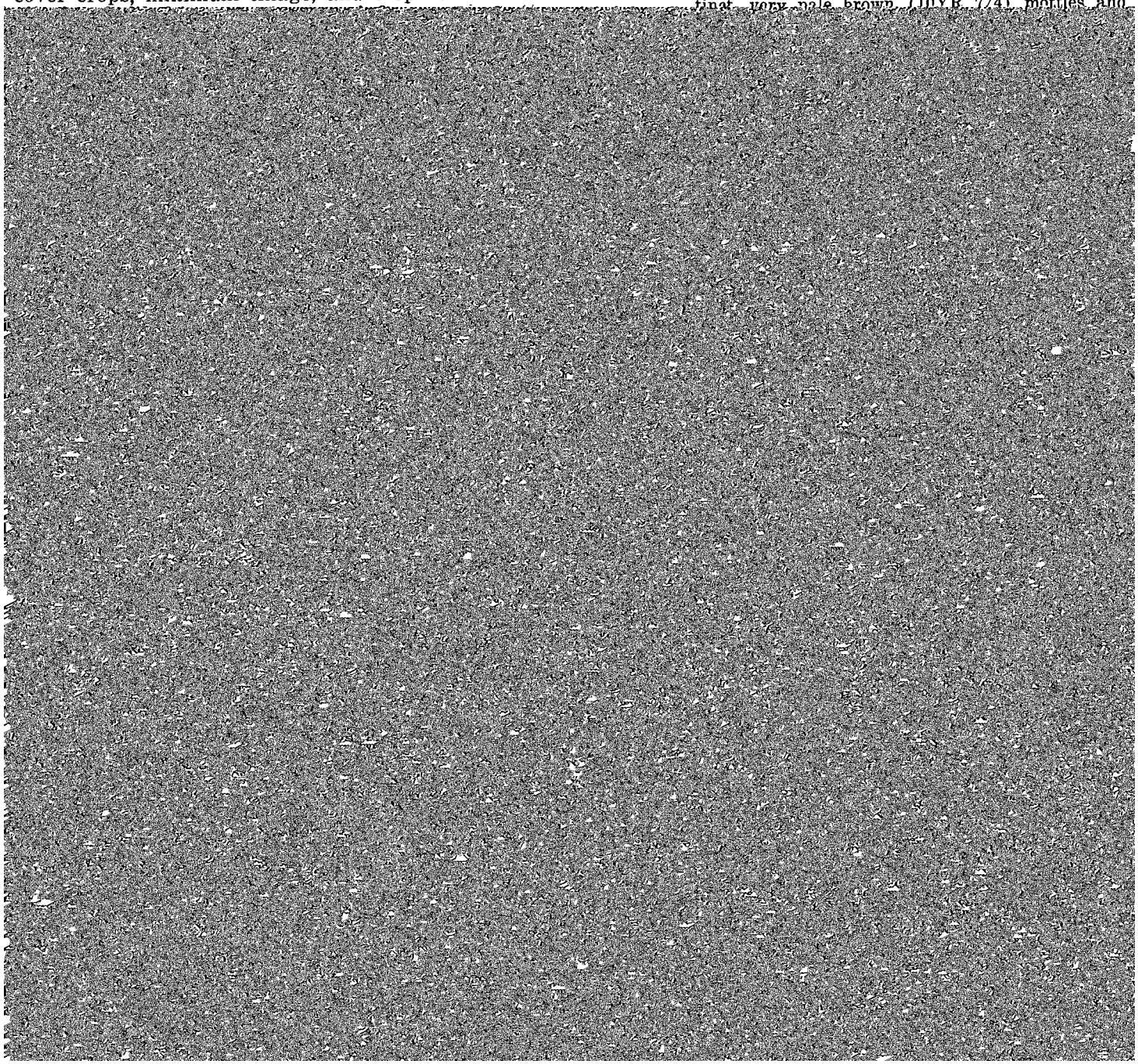
This soil is suited to most locally grown crops. The main crops are corn, soybeans, cotton, tobacco, small grain, and truck crops, such as snap beans, tomatoes, cucumbers, sweet potatoes, and onions. Drainage may be required for some crops, such as tobacco.

This soil has good tilth and can be worked within a fairly wide range of moisture content. Tillage operations, however, are delayed in wet seasons. Winter cover crops, minimum tillage, and crop residue man-

tinct, brownish-yellow (10YR 6/6) mottles, and few, fine, prominent, red mottles; weak, medium, subangular blocky structure; firm, sticky and plastic; few fine roots; thin continuous clay films on faces of peds; very strongly acid; gradual, wavy boundary.

B3—54 to 84 inches, yellowish-brown (10YR 5/4) sandy clay loam; many, coarse, distinct, light brownish-gray (10YR 6/2) mottles and common, medium, distinct, brownish-yellow (10YR 6/6) mottles; weak, medium, subangular blocky structure; friable, slightly sticky and slightly plastic; common medium pores; thin discontinuous clay films on faces of peds; common medium iron concretions; very strongly acid; gradual, wavy boundary.

Cg—84 to 100 inches, light-gray (10YR 7/1) sandy clay loam; pockets of sandy loam; many, medium, distinct, very pale brown (10YR 7/4) mottles and



Tobacco, soybeans, cotton, forage crops, and corn are the main crops.

Winter cover crops, minimum tillage, and crop resi-

B3—58 to 70 inches, yellowish-brown (10YR 5/8) clay loam; many, coarse, prominent, red (2.5YR 4/8) and light-gray (10YR 7/1) mottles; weak, fine,

fine roots; medium acid; abrupt, smooth boundary.

B21t—6 to 30 inches, red (2.5YR 4/6) clay; moderate, medium, subangular blocky structure; firm, sticky and plastic; strongly acid; clear, wavy boundary.

B22t—30 to 48 inches, yellowish-red (5YR 4/8) clay; few, medium, distinct, yellowish-brown (10YR 5/8) and red (2.5YR 4/8) mottles; moderate, medium, subangular blocky structure; firm, sticky and plastic; very strongly acid; clear, wavy boundary.

B23t—48 to 60 inches, yellowish-red (5YR 4/8) clay; common, medium, distinct, yellowish-brown (10YR 5/8) and red (2.5YR 4/8) mottles; moderate, medium, subangular blocky structure; firm, sticky and plastic; common clay films on faces of peds; very strongly acid; gradual, wavy boundary.

B24t—60 to 70 inches, red (2.5YR 4/6) clay; common, medium, distinct, brownish-yellow (10YR 6/6) and light-gray (10YR 7/1) mottles; weak, medium, subangular blocky structure; firm, sticky and plastic; very strongly acid.

The solum is 60 to 100 inches thick. The soils are strongly acid or very strongly acid throughout unless they have been limed. The Ap horizon is grayish brown, brown, dark brown, or yellowish brown. In some places there is an A2 horizon of brown and yellowish-brown fine sandy loam. The B2t horizon is yellowish-red or red clay, sandy clay, or clay loam.

FaA—Faceville fine sandy loam, 0 to 2 percent slopes. This well-drained soil is on the highest part of broad, smooth plains. Most mapped areas cover 5 to 80 acres.

erately well drained soils on uplands.

In a representative profile the surface layer is grayish-brown loamy sand about 7 inches thick. The subsurface layer is yellowish-brown loamy sand 3 inches thick. The subsoil is 54 inches thick. The upper part is yellowish-brown sandy clay loam that has mottles in shades of gray and red below a depth of 20 inches. The lower part is gray sandy clay loam that has mottles in shades of red and brown. The underlying material, to a depth of 70 inches, is gray sandy loam that has mottles in shades of brown.

Goldsboro soils are low in natural fertility and organic-matter content. Permeability is moderate, the available water capacity is medium, and the shrink-swell potential is low. The seasonal high water table is about 2½ feet below the surface from December through March.

Most of the acreage is in crops. The rest is forested.

Representative profile of Goldsboro loamy sand, 0 to 2 percent slopes, in a cultivated field north of Lumberton on State Road 1003, 1⅜ miles west of Barker Ten Mile Church, and 1,650 feet north of State Road 1935:

Ap—0 to 7 inches, grayish-brown (10YR 5/2) loamy sand; weak, medium, granular structure; very friable;

areas of soils that have a surface layer of sandy loam, fine sandy loam, and loamy fine sand. Also included are small areas of Duplin, Lynchburg, and Norfolk soils, small areas that have a combined surface layer and subsoil less than 60 inches thick, and small areas of soils that have slopes of more than 2 percent. A few wet spots, one-quarter acre to 3 acres in size, are shown by a special symbol on the detailed soil map.

This soil is well suited to all locally grown crops. These soils are subject to rare flooding for very brief periods from February through April.

Most of the acreage is in crops. The rest is forested.

Representative profile of Johns sandy loam, in a cultivated field 1½ miles southwest of Lumberton city limit on State Highway 41 and 25 feet west of road:

Ap—0 to 9 inches, dark-gray (10YR 4/1) sandy loam; weak, medium, granular structure; very friable; common medium and fine roots; strongly acid

and maintenance of drainage systems. Capability unit

Interstate Highway 95, and 50 feet west of a private drive:

Ap—0 to 7 inches, grayish-brown (10YR 5/2) loamy sand; weak, medium, granular structure; very friable; common fine roots; slightly acid; abrupt, smooth boundary.

A2—7 to 10 inches, pale-brown (10YR 6/3) loamy sand; weak, medium, granular structure; very friable; common fine roots; strongly acid; clear, smooth boundary.

B1—10 to 13 inches, light yellowish-brown (10YR 6/4) sandy loam; weak, medium, subangular blocky structure; friable; few fine roots; common medium pores; very strongly acid; clear, smooth boundary.

B21t—13 to 30 inches, yellowish-brown (10YR 5/6) sandy clay loam; weak, medium, subangular blocky structure; friable, slightly sticky; few fine roots; few prominent clay films on faces of peds; few fine mica flakes; few black organic stains; very strongly acid; gradual, wavy boundary.

B3—30 to 36 inches, light yellowish-brown (10YR 6/4) sandy loam; massive; very friable; pockets of sandy clay loam; few fine quartz pebbles; few fine mica flakes; few dark minerals; very strongly acid; clear, smooth boundary.

IIC1—36 to 48 inches, very pale brown (10YR 7/4) coarse sand and fine gravel; few, coarse, distinct, white (10YR 8/1) mottles; single grained; loose; few

In a representative profile the surface layer is grayish-brown sand about 4 inches thick. The underlying material, to a depth of 90 inches, is brownish-yellow, yellowish-brown, yellow, and very pale brown sand.

Lakeland soils are very low in natural fertility and organic-matter content. Permeability is rapid, the available water capacity is very low, and the shrink-swell potential is low. The seasonal high water table is at a depth of more than 5 feet.

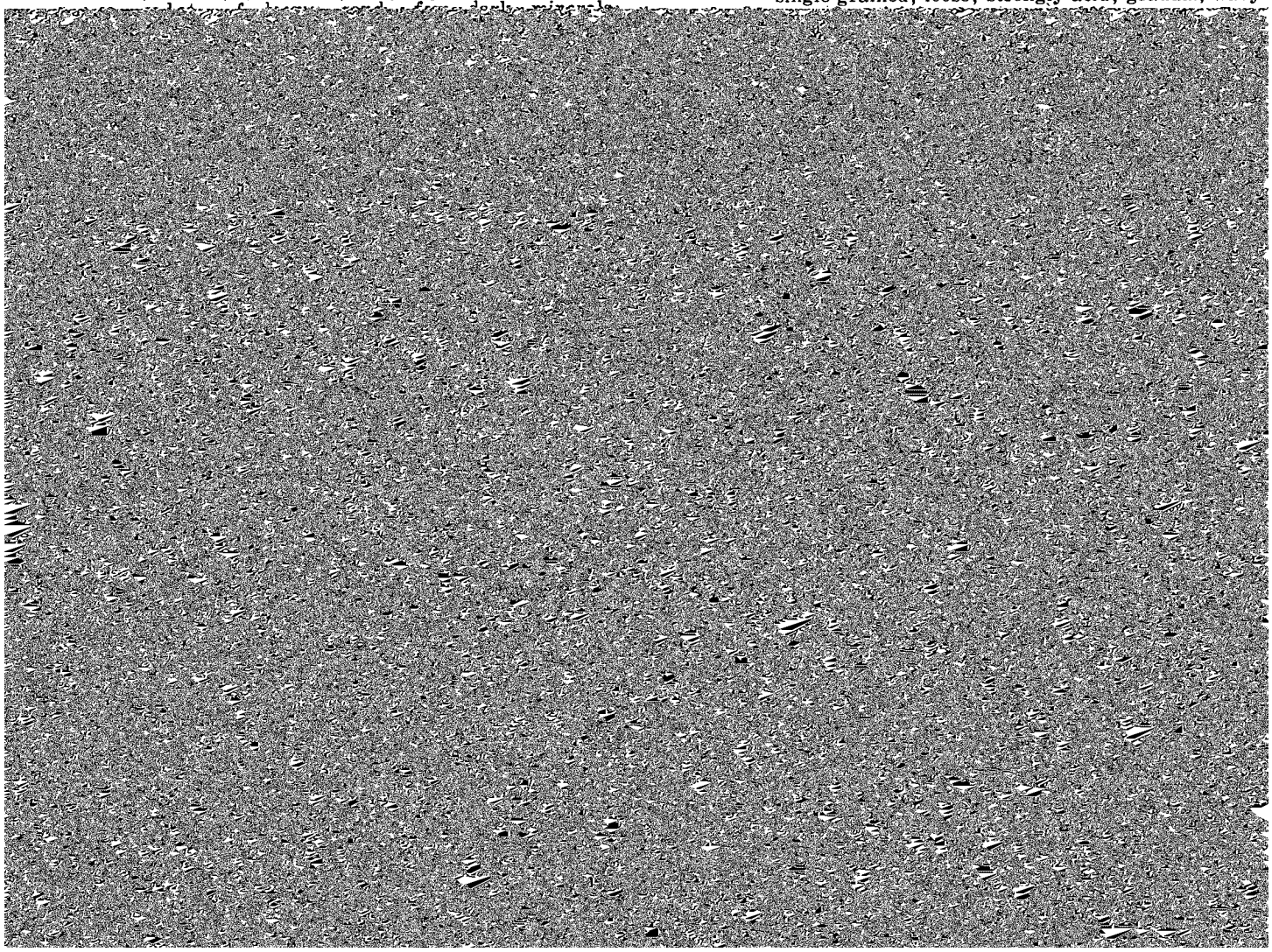
About half the acreage is in crops or pasture. The rest is chiefly forested.

Representative profile of Lakeland sand, 0 to 6 percent slopes, in a pine plantation 1 mile southeast of Lumberton, one-fourth mile north of gateway of Carolina Power and Light Plant on paved road, and 250 feet east of road:

A1—0 to 4 inches, grayish-brown (10YR 5/2) sand; single grained; loose; many fine roots; medium acid; clear, wavy boundary.

C1—4 to 29 inches, brownish-yellow (10YR 6/6) sand; single grained; loose; few fine roots; strongly acid; gradual, wavy boundary.

C2—29 to 38 inches, yellowish-brown (10YR 5/8) sand; single grained; loose; strongly acid; gradual, wavy



tions. Blowing sand often damages young plants. Capability unit IVs–1; woodland group 4s2.

Leon Series

is commonly very pale brown, very dark grayish brown, light yellowish brown, light brownish gray, and light gray.

Le—Leon sand. This nearly level, poorly drained soil is on interbay divides on uplands, on stream ter-

ture; friable; patchy clay films on faces of peds; very strongly acid; gradual, wavy boundary.

B3g—30 to 36 inches, gray (10YR 5/1) sandy loam; weak, medium and fine, subangular blocky structure; friable; small pockets of sandy clay loam; very strongly acid; gradual, wavy boundary.

IIC1g—36 to 55 inches, gray (10YR 5/1) loamy sand; single grained; loose; very strongly acid; gradual, wavy boundary.

IIC2g—55 to 73 inches, dark-gray (10YR 4/1) loamy sand; single grained; loose; pockets of loamy sand; very strongly acid.

The solum is commonly 28 to 40 inches thick. The soils are strongly acid or very strongly acid throughout unless they have been limed. The A horizon is dark gray, very dark gray, or black. In some places there is an A2 horizon that is grayish-brown to gray. The B2t horizon is light brownish gray, grayish brown, or gray. The B3 horizon is gray to grayish brown. The C horizon is commonly white, gray, dark-gray, or grayish-brown loamy sand or sand that has pockets of sandy loam.

Lu—Lumbee sandy loam. This nearly level, poorly drained soil is on stream terraces. Most mapped areas cover 4 to 300 acres.

Included with this soil in mapping are a few small areas of soils that have a surface layer of loamy sand and fine sandy loam and small areas of Johns and Portsmouth soils. Also included are some small areas of soils that have a slightly more clayey subsoil, some small areas of soils that have a subsoil of sandy loam, and some small areas of soils that have clayey underlying material.

This soil is suited to a few locally grown crops if it is drained. The main crops are corn, soybeans, and small grain.

This soil has good tilth and can be worked within a wide range of moisture content. Tillage operations, however, are delayed in wet seasons. Minimum tillage and crop residue management help to maintain the organic-matter content. Winter cover crops may drown in the low-lying areas.

A seasonal high water table and flooding are the main limitations in the use and management of this soil. Drainage is needed for most uses, but the sandy underlying material in ditch banks is unstable, which makes the installation and maintenance of drainage systems difficult. Capability unit IIIw–3; woodland group 2w9.

Lynchburg Series

The Lynchburg series consists of nearly level, somewhat poorly drained soils on uplands.

In a representative profile the surface layer is dark-gray sandy loam about 3 inches thick. The subsurface layer is pale-brown sandy loam 4 inches thick. The subsoil is sandy clay loam 54 inches thick. The upper part is pale brown and has mottles in shades of brown and gray, the middle part is light brownish gray and has mottles in shades of brown, and the lower part is light gray and pale brown. The underlying material, to a depth of 68 inches, is light-gray and white sandy clay loam.

Lynchburg soils are low in natural fertility and organic-matter content. Permeability is moderate, the available water capacity is medium, and the shrink-swell potential is low. The seasonal high water table is 1½ feet below the surface from November through April.

Most of the acreage is in crops and pasture. The rest is forested.

Representative profile of Lynchburg sandy loam, in a wooded area 1¼ miles south of Maxton on U.S. Highway 74, ⅝ mile south of State Road 1153, ⅛ mile west and ¼ mile south on farm road, and 200 feet northwest:

A1—0 to 3 inches, dark-gray (10YR 4/1) sandy loam; weak, medium, granular structure; friable; abundant medium roots; strongly acid; abrupt, wavy boundary.

A2—3 to 7 inches, pale-brown (10YR 6/3) sandy loam; weak, medium, granular structure; friable; many medium roots; strongly acid; abrupt, wavy boundary.

B1—7 to 11 inches, pale-brown (10YR 6/3) sandy clay loam; weak, medium, subangular blocky structure; friable; few fine roots; strongly acid; clear, wavy boundary.

B21t—11 to 16 inches, pale-brown (10YR 6/3) sandy clay loam; common, medium, faint, yellowish-brown (10YR 5/6) and light brownish-gray (10YR 6/2) mottles; weak, medium, subangular blocky structure; friable; few medium roots; very strongly acid; gradual, wavy boundary.

B22tg—16 to 45 inches, light brownish-gray (10YR 6/2) sandy clay loam; many, coarse, distinct, yellowish-brown (10YR 5/8) and pale-brown (10YR 6/3) mottles; weak, medium, subangular blocky structure; friable; few medium and fine roots; patchy clay films on faces of peds; pockets of sandy loam (grayer color); some of the yellowish-brown material is brittle; very strongly acid; gradual, wavy boundary.

B3g—45 to 61 inches, light-gray (10YR 7/2) and pale-brown (10YR 6/3) sandy clay loam; pockets of sandy loam; weak, medium, subangular blocky structure; friable; thin patchy clay films on faces of peds; very strongly acid; gradual, wavy boundary.

Cg—61 to 68 inches, light-gray (10YR 7/1) and white (10YR 8/2) sandy clay loam; few, coarse, distinct, yellow (10YR 7/6) mottles; massive; friable; very strongly acid.

The solum is 60 to 80 inches thick. The soils are strongly acid or very strongly acid throughout unless they have been limed. The Ap or A1 horizon is dark-gray, very dark grayish-brown, or very dark gray sandy loam and loamy sand. The A2 horizon is light brownish-gray, pale-brown, and light yellowish-brown fine sandy loam or sandy loam. The B21t horizon is pale brown or light yellowish brown. The B22t horizon is gray, light brownish gray, or light gray. The B3 horizon is pale-brown, light brownish-gray, or light-gray sandy clay loam or sandy loam. The C horizon is commonly gray, light gray, pale brown, or white and is loamy sand, sandy clay loam, sandy loam, and sandy clay.

Ly—Lynchburg sandy loam. This nearly level, somewhat poorly drained soil is on broad, smooth plains. Most mapped areas cover 5 to 200 acres.

Included with this soil in mapping are a few small areas of soils that have a surface layer of fine sandy loam. Also included are small areas of Dunbar, Goldsboro, and Rains soils, a few small areas of soils that have a subsoil of sandy clay loam that extends to a depth of less than 60 inches, and a few small areas of soils that have a surface layer of loamy sand, 20 to 40 inches thick, over a subsoil of sandy clay loam.

This soil is well suited to most locally grown crops if drained. The main crops are corn (fig. 5), cotton,

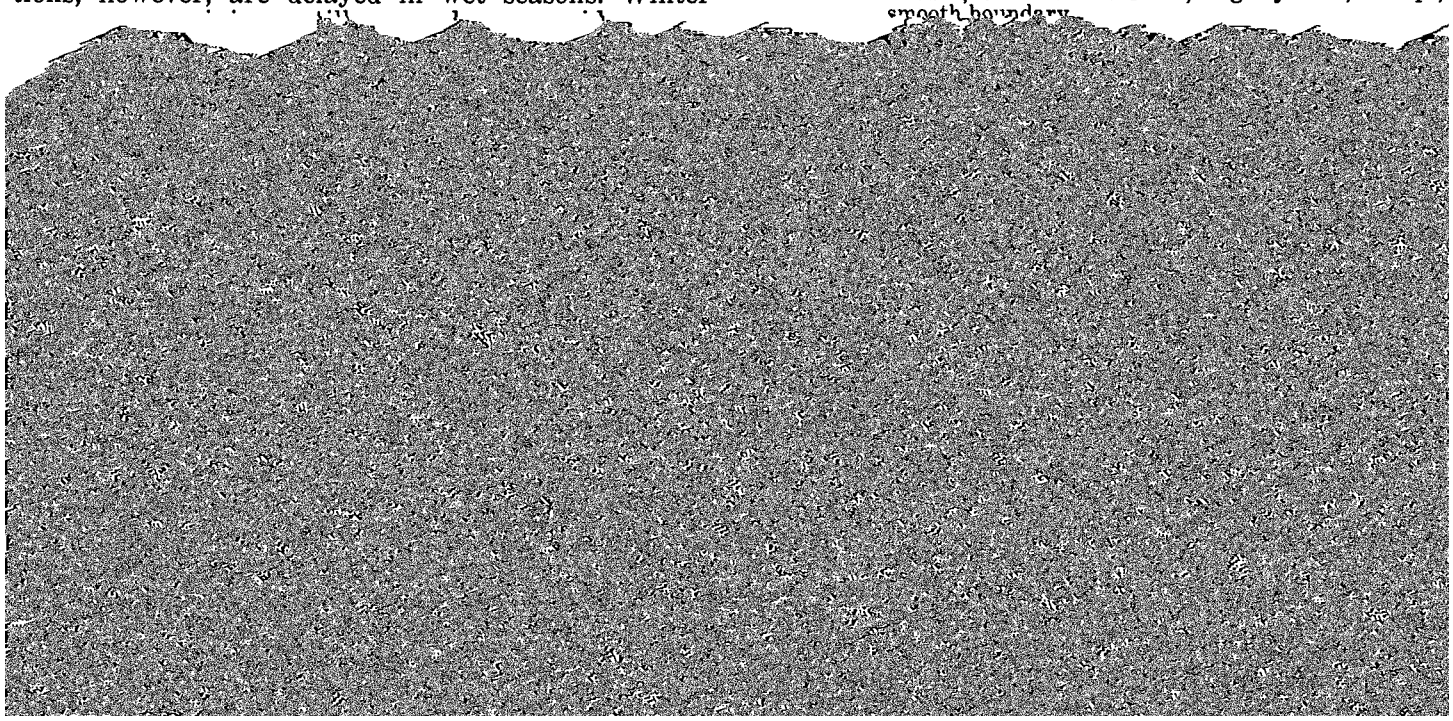
Figure 5.—**Field of corn on Lynchburg sandy loam.**

tobacco, soybeans, strawberries, forage crops, and truck crops, such as snap beans, tomatoes, cucumbers, sweet potatoes, and onions. Drainage is required for crops such as tobacco.

This soil has good tilth and can be worked within a fairly wide range of moisture content. Tillage operations, however, are delayed in wet seasons. Winter

2 percent slopes, in a cleared field 4 miles north of Interstate Highway 95 on State Highway 72, 2 miles north of State Road 1513, one-half mile west on State Road 1517, and 800 feet south of road:

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) sandy loam; moderate, medium, granular structure; very friable; common fine roots; slightly acid; abrupt, smooth boundary.



loamy sand, loamy fine sand, or sandy loam. The B2t horizon is yellowish-brown or strong-brown sandy clay, sandy clay loam, or clay loam. The B3 horizon is sandy loam to clay. In some places the lower part of the B horizon contains plinthite nodules, but it is less than 5 percent plinthite within a depth of 60 inches.

MaA—Marlboro sandy loam, 0 to 2 percent slopes. This well drained soil is on broad, smooth plains. Most

water capacity is low, and the shrink-swell potential is low. The seasonal high water table is at or near the surface from November through April. These soils are ponded for long periods from November through May.

Most of the acreage is in crops and pasture. Some is forested.

Representative profile of McColl loam, in a large

natural outlets for drainage. Most mapped areas cover 10 to 80 acres.

Included with this soil in mapping are a few small areas of soils that have a surface layer of fine sandy loam and clay loam. Also included are small areas of Coxville, Dunbar, Lynchburg, and Rains soils.

This soil is suited to a few locally grown crops if it is drained. The main crops are corn, soybeans, and forage crops.

This soil has good tilth and can be worked within a wide range of moisture content. Tillage operations, however, are delayed in wet seasons. Minimum tillage and crop residue management help to maintain tilth and the organic-matter content. Winter cover crops may drown in the low-lying areas.

A seasonal high water table and slow permeability are the main limitations in the use and management of this soil. Wetness is a very severe limitation, and drainage is needed for most uses. Capability unit IIIw–2 drained, IVw–2 undrained; woodland group 2w9.

Meggett Series

light olive-brown (2.5Y 5/4) mottles; weak, medium, subangular blocky structure; friable; common medium roots; moderately alkaline; gradual, wavy boundary.

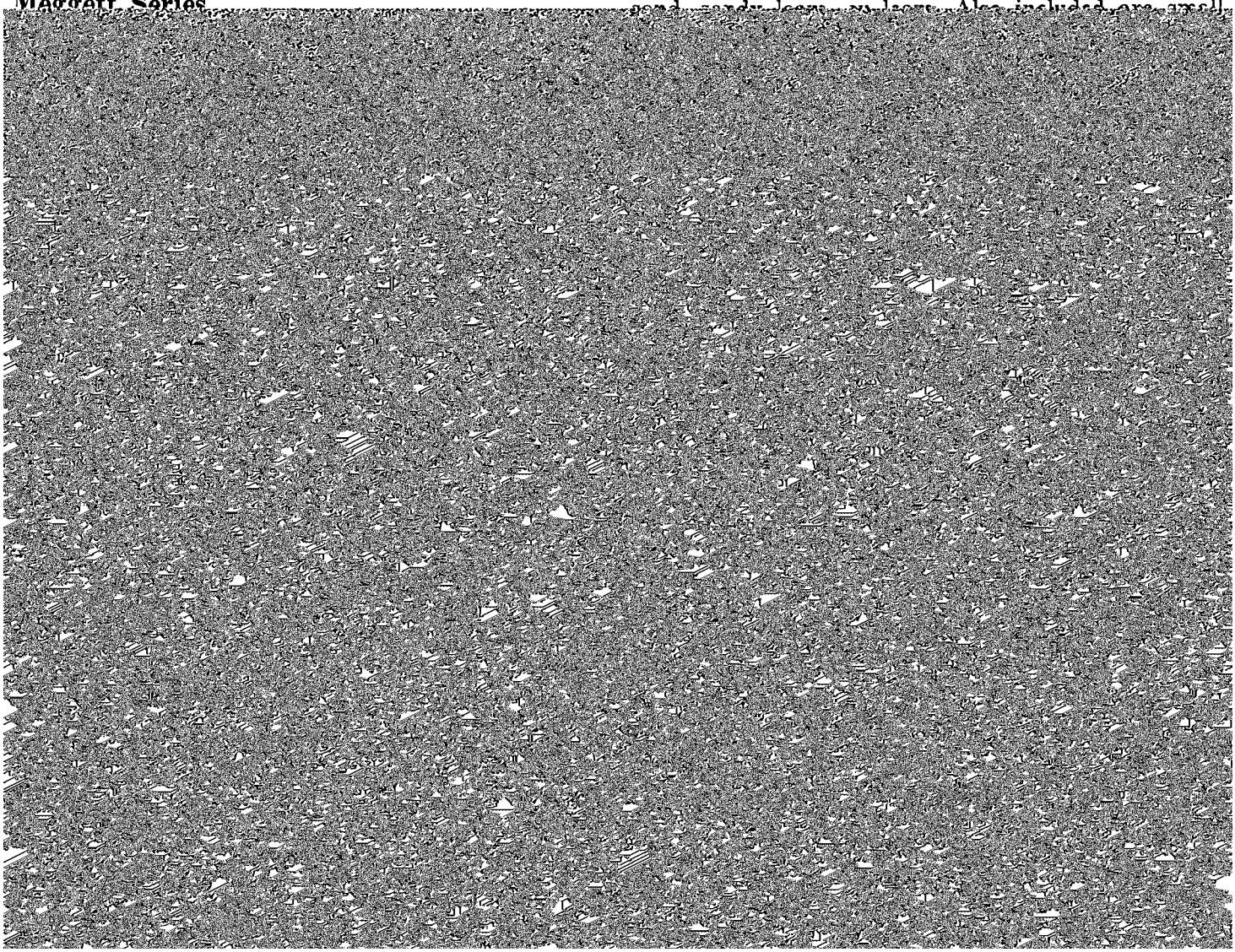
IIC1g—41 to 46 inches, gray (10YR 6/1) loamy fine sand; lenses of sandy loam and small spots of lighter colored sand; single grained; loose; moderately alkaline; gradual, wavy boundary.

IIC2g—46 to 55 inches, light-gray (10YR 7/1) and white (10YR 8/1) sand; single grained; loose; moderately alkaline.

The solum is 40 to 60 inches thick. Unless the soils have been limed, the A horizon is medium acid and the B horizon is neutral to moderately alkaline. The A1 horizon is dark gray, very dark gray, or black. In some places there is an A2 horizon that is light brownish gray, gray, light gray, or dark gray and is fine sandy loam, sandy loam, or loamy sand. The B2t horizon is light-gray, gray, or dark-gray sandy clay or clay. The IIC horizon is gray or light-gray sand to sandy clay. In many places it contains marl or shell fragments.

Me—Meggett fine sandy loam. This nearly level, poorly drained soil is on stream terraces and drainageways. Most mapped areas cover 10 to 150 acres.

Included with this soil in mapping are a few small areas of soils that have a surface layer of loamy fine sand, sandy loam, or loam. Also included are small



loam; weak, medium, granular structure; friable; many medium and large roots; strongly acid; abrupt, smooth boundary.

B1—7 to 10 inches, light olive-brown (2.5Y 5/4) loam; common, medium, distinct, strong-brown (7.5YR 5/6) and yellowish-brown (10YR 5/6) mottles; weak, medium, subangular blocky structure; friable; many medium and large root pores filled with material from the Ap horizon; patchy clay films on faces of peds; few, hard, strong-brown nodules 5 to 15 millimeters in size; strongly acid; gradual, wavy boundary.

B21tg—10 to 30 inches, light brownish-gray (2.5Y 6/2) clay loam; many, medium and coarse, prominent, red (2.5YR 4/6), yellowish-red (5YR 5/8), and brownish-yellow (10YR 6/6) mottles; moderate, medium, subangular blocky structure; friable; prominent clay films on faces of peds and pore walls; few, hard, strong-brown concretions 5 to 15 millimeters in size; strongly acid; gradual, wavy boundary.

B22tg—30 to 50 inches, light-gray (10YR 6/1) clay loam; many, prominent, coarse, red (2.5YR 4/6) and brownish-yellow (10YR 6/6) mottles; weak, medium, subangular blocky structure; friable; promi-

Norfolk Series

The Norfolk series consists of nearly level to sloping, well-drained soils on uplands.

In a representative profile the surface layer is grayish-brown loamy sand about 9 inches thick. The subsurface layer is light yellowish-brown loamy sand 5 inches thick. The subsoil is 68 inches thick. It is yellowish-brown sandy loam in the upper 3 inches. In the next 53 inches, it is yellowish-brown sandy clay loam that has mottles in shades of red, brown, and gray. In the lower 12 inches, it is mottled brownish-yellow, pale-brown, yellowish-red, and gray sandy clay loam. The underlying material, to a depth of 100 inches, is mottled red, strong-brown, brownish-yellow, and gray, stratified loamy material.

Norfolk soils are low in natural fertility and organic-matter content. Permeability is moderate, the available water capacity is medium, and the shrink-swell poten-

brown, dark gray, light yellowish brown, or yellowish brown and is loamy sand and loamy fine sand. The A2 horizon is very pale brown, pale-brown, or light yellowish-

beans, tomatoes, cucumbers, sweet potatoes, and onions.

The soil has no major limitations for use and management. Winter cover crops and crop residue man-

tations in the use and management of the soil. Capability unit IIe–1; woodland group 2o1.

NsC—Norfolk and Faceville soils, 6 to 10 percent slopes. These well-drained soils are on side slopes between nearly level or gently sloping soils and soils on the flood plains of major drainageways. Most areas are long and narrow and range from 5 to 25 acres. Any mapped area can consist of either or both of the soils. Slightly more than half the total acreage is Norfolk soil.

The Norfolk soil in this mapping unit has a profile similar to the one described as representative of the Norfolk series. The Faceville soil has a profile similar to the one described as representative of the Faceville series, but the subsoil contains slightly more sand.

Included with these soils in mapping are some small areas of soils that have sandy layers of loamy sand

grained; loose; very strongly acid; gradual, wavy boundary.

C4—52 to 67 inches, light brownish-gray (10YR 6/2) sand; single grained; loose; very strongly acid; gradual, wavy boundary.

C5—67 to 75 inches, dark grayish-brown (10YR 4/2) sand; single grained; loose; very strongly acid.

The Osier soils are strongly acid or very strongly acid throughout unless they have been limed. The A1 or Ap horizon is black or very dark gray loamy sand or sand. The C horizon is commonly dark-gray, dark grayish-brown, gray, grayish-brown, light brownish-gray, or light-gray sand, but in some places there is a thin C1 horizon of gray or light grayish brown loamy sand.

Pactolus Series

The Pactolus series consists of nearly level, moderately well drained soils on uplands and stream terraces.

erately well drained soil is in depressions and drainageways on broad, smooth ridges and stream terraces. Most mapped areas cover 8 to 60 acres.

Included with this soil in mapping are small areas of soils that contain less than 10 percent silt and clay

Pg—Pantego fine sandy loam. This nearly level, very poorly drained soil is on the lowest part of irregularly shaped or oval bays. Most mapped areas cover 5 to 250 acres.

Included with this soil in mapping are a few small

The solum is more than 65 inches thick. The soils are strongly acid or very strongly acid throughout unless they have been limed. The A1 horizon is black to dark gray or grayish brown. The A2 horizon is gray, light-gray, or white loamy sand, sand, or fine sand. The B2t horizon is gray or light-gray sandy loam or sandy clay loam.

Pm—Plummer and Osier soils. These nearly level, poorly drained soils are in depressions and along drainageways on uplands and stream terraces. These soils are similar in use and management, and for the purpose of this survey it was not practical to map them separately. Slightly more than half the total acreage is Plummer soil.

The profile of the Plummer soil in this mapping unit is similar to the one described as representative of the Plummer series, but the subsoil is sandy loam. The profile of the Osier soil is similar to the one described as representative of the Osier series.

Included with these soils in mapping are small areas of Bibb and Rains soils and other wet soils.

Most of the acreage is forested; some is in crops and pasture. The soils are suited to a few locally grown crops if they are drained. The main crops are corn, soybeans, and pasture grasses.

Minimum tillage and crop residue management help to maintain the organic-matter content. Tillage operations, however, are delayed in wet seasons.

A seasonal high water table and flooding are the main limitations in the use and management of these soils. Wetness is a very severe limitation in winter and

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, fine, granular structure; loose; common medium roots; medium acid; abrupt, smooth boundary.

A2—7 to 22 inches, pale-brown (10YR 6/3) sand; single grained; loose; strongly acid; clear, wavy boundary.

B2t—22 to 34 inches, yellowish-brown (10YR 5/6) sandy loam; weak, medium, granular structure; very friable; few fine roots; common medium pores; strongly acid; gradual, wavy boundary.

A'2—34 to 47 inches, yellow (10YR 7/6) loamy sand; weak, medium, granular structure to single grained; loose; strongly acid; gradual boundary.

B'21t—47 to 57 inches, brownish-yellow (10YR 6/6) sandy clay loam; common, medium, distinct, yellowish-red (5YR 5/8) mottles; weak, medium, subangular blocky structure; friable; strongly acid; gradual, wavy boundary.

B'22t—57 to 64 inches, light yellowish-brown (10YR 6/4) sandy clay loam; common, medium, distinct, red (10YR 4/8) and very pale brown (10YR 7/3) mottles; weak, medium, subangular blocky structure; friable; few, rough, irregular iron nodules; strongly acid; gradual, wavy boundary.

B'23t—64 to 72 inches, yellowish-brown (10YR 5/8) sandy clay loam; many, coarse, prominent, red (10R 4/8) and light-gray (10YR 7/2) mottles and many, coarse, distinct, strong-brown (7.5YR 5/8) mottles; weak, medium, subangular blocky structure; friable; about 3 percent hard iron fragments; strongly acid.

The solum is 72 to more than 90 inches thick. The soils are strongly acid or very strongly acid throughout unless they have been limed. The A1 or Ap horizon is dark grayish brown or grayish brown. The A2 horizon is pale-brown,

Ponzer Variant

The Ponzer variant consists of level, very poorly drained soils in large bays on uplands.

In a representative profile the surface layer is very dark brown muck about 18 inches thick. Below this is a thin layer of yellow silt loam 3 inches thick. The next layer is black mucky loam that extends to a depth of about 31 inches. The underlying material extends to a depth of 60 inches. It is light brownish-gray and light-gray clay loam in the upper part, dark grayish-brown and grayish-brown sandy loam in the middle part, and very pale brown and white sand in the lower part.

Ponzer soils are low in natural fertility and high in organic-matter content. Permeability is moderate, the available water capacity is very high, and subsidence is high if the soils are drained. The seasonal high water table is at or near the surface from November through July. The soils are subject to ponding for long periods from November through June.

A small acreage is in crops, and the rest is forested. About half of the acreage has been drained.

Representative profile of Ponzer muck, siliceous subsoil variant, 1¼ miles south of Rennert east of the Main Canal in the northwest section of the desert. 40

This soil is mainly forested. Because of flooding and wetness, it is generally unsuited to crops. It is moderately well suited to a few locally grown crops if it is drained and protected. The main crops are corn, soybeans, and forage crops.

A seasonal high water table, flooding, and the necessity of regulating the moisture level in the soil are the main limitations to use and management. Capability unit IVw–3 drained, VIIw–1 undrained; woodland group 4w3.

Portsmouth Series

The Portsmouth series consists of nearly level, very poorly drained soils on stream terraces. These soils formed in old Coastal Plain alluvium.

In a representative profile the surface layer is black loam about 12 inches thick. The subsoil is 26 inches thick. It is very dark gray sandy loam in the upper part, very dark grayish-brown sandy clay loam in the middle part, and dark-gray and very dark gray sandy loam in the lower part. The underlying material, to a depth of 62 inches, is dark-gray sandy loam and dark grayish-brown loamy sand.

Portsmouth soils are low in natural fertility and

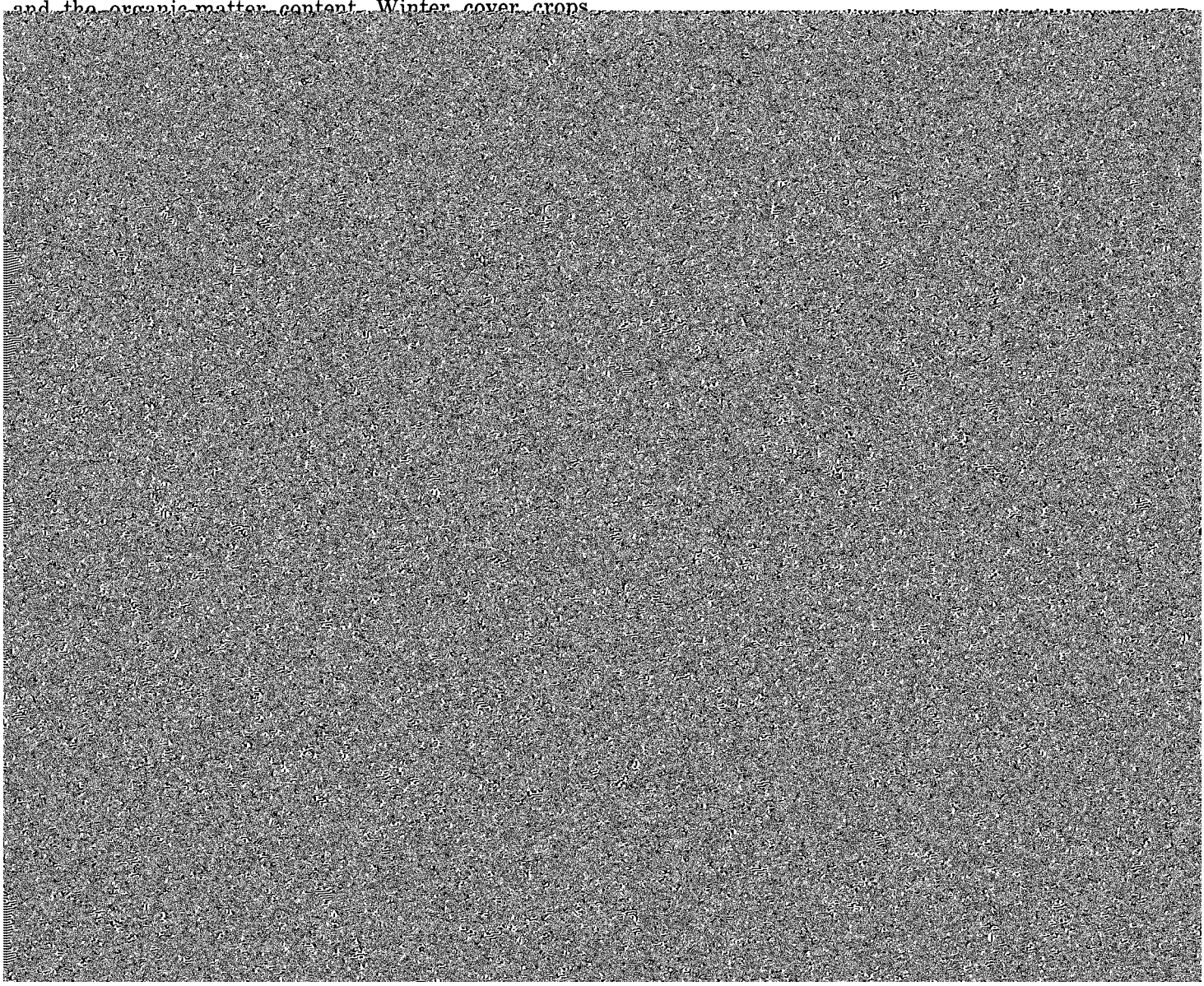
Pt—Portsmouth loam. This nearly level, very poorly drained soil is on low stream terraces and is on the lowest part of the landscape. Most mapped areas cover 10 to 350 acres.

Included with this soil in mapping are a few small areas of soils that have a surface layer of fine sandy loam, sandy loam, or loamy sand. Also included are small areas of Lumbee, Bibb, and Johnston soils, a few small areas of soils that have a subsoil of sandy clay loam that extends to a depth of 50 to 60 inches, and some small areas of soils that have a black surface layer more than 20 inches thick.

This soil is suited to a few locally grown crops if it is drained. The main crops are corn, soybeans, fescue, and truck crops, such as snap beans, tomatoes, cucumbers, sweet potatoes, and onions.

This soil has good tilth and can be worked within a wide range of moisture content. Tillage operations, however, are delayed in wet seasons. Minimum tillage and crop residue management help to maintain tilth and the organic matter content. Winter cover crops

Figure 7.—**Stand of pine on Rains sandy loam.**



soils and a few small areas of soils that are 40 to 60 inches deep to sandier layers.

Wetness is a severe limitation for crops. If the soil is drained, it is suited to a few locally grown crops. The main crops are strawberries, corn, soybeans, fescue, and ladino clover.

This soil has good tilth and can be worked within a

through April. These soils are ponded for very brief periods from November through March.

Most of the acreage is forested. Only a small acreage is in crops.

Representative profile of Rutlege loamy sand, in a wooded area 4.2 miles southwest of Bladenboro on State Highway 242, 0.5 mile south on unpaved State

small areas of Johnston, Bibb, Plummer, and Torhunta soils.

This soil is mainly forested. It can be used for corn, soybeans, forage crops, and truck crops, such as snap beans, tomatoes, cucumbers, sweet potatoes, onions, and blueberries, if it is drained.

A seasonal high water table, ponding, very low naural fertility, and leaching of plant nutrients are the main limitations in the use and management of this soil. The organic-matter content can be maintained by returning crop residue to the soil. Drainage is needed for most crops and pasture plants, but it is difficult to install and maintain drainageways because of the sand and poor outlets. Capability unit Vw-1; woodland group 2w3.

Toisnot Series

The Toisnot series [illegible]

spade); dry or very slightly moist when adjacent horizons are saturated; very strongly acid; gradual, irregular boundary.

B'2tg—45 to 61 inches, gray (10YR 6/1) sandy clay loam; many, coarse, faint, light-gray (10YR 7/1) bodies of sandy loam; weak, medium, subangular blocky structure; friable; few fine roots; sandy loam is brittle and decreases with depth; few small bodies of clean sand; very strongly acid; gradual, wavy boundary.

IIC1g—61 to 80 inches, gray (10YR 5/1, 6/1) sandy clay; common, medium, faint, light brownish-gray (10YR 6/2) and light-gray (10YR 7/2) mottles and common small pockets of dark gray (10YR 4/1); massive; firm; few fine roots; very strongly acid; gradual, wavy boundary.

IIC2g—80 to 90 inches, light-gray (10YR 7/1) clay; few, fine, distinct, yellow mottles; massive; very firm, plastic; few fine roots; very strongly acid.

The solum is 40 to more than 80 inches thick. The soils are strongly acid or very strongly acid throughout unless they have been limed. The Ap or A1 horizon is black, very

The underlying material is grayish-brown loamy sand that has mottles in shades of gray and yellow.

Torhunta soils are low in natural fertility and high in organic-matter content. Permeability is moderately rapid, the available water capacity is medium, and the shrink-swell potential is low. The seasonal high water

bility unit IIIw–3 drained, VIw–1 undrained; woodland group 2w9.

Trebloc Series

The Trebloc series consists of nearly level, poorly

that is gray or dark gray. The B2tg horizon is gray or light-gray silt loam, silty clay loam, and clay loam. The C horizon is clayey or loamy sediment.

Tr—Trebloc loam. This nearly level, poorly drained soil is on broad plains and is on the lowest part of the

6 percent slopes, in a cultivated field 1½ miles east of the St. Pauls railroad station, 900 feet south on State Highway 20, and 50 feet east of farm road:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) loamy

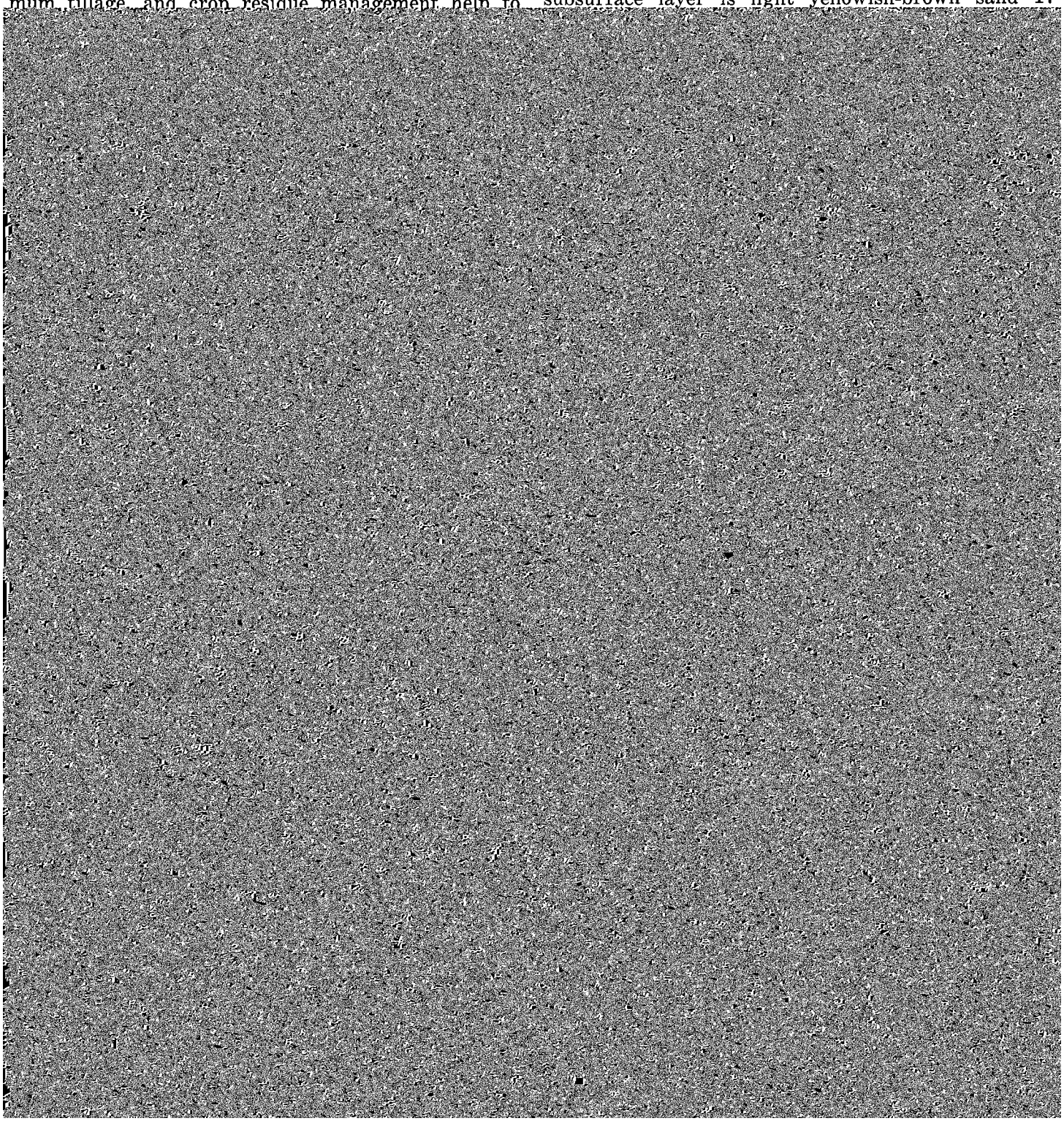
This soil is fairly well suited to most locally grown crops. The main crops are corn, cotton, tobacco, soybeans, and forage crops (fig. 9).

Low natural fertility, leaching of plant nutrients, droughtiness, and soil blowing are the main limitations in the use and management of this soil. Blowing sand may damage young plants. Winter cover crops, minimum tillage, and crop residue management help to

Wakulla Series

The Wakulla series consists of nearly level to gently sloping, somewhat execessively drained soils on uplands.

In a representative profile (fig. 10) the surface layer is dark grayish-brown sand about 7 inches thick. The subsurface layer is light yellowish-brown sand 17



Very low natural fertility, very low available water capacity, leaching of plant nutrients, droughtiness, and soil blowing are the main limitations in the use and management of this soil. Blowing sand often damages young plants. Minimum tillage, crop residue management, and including close-growing grasses and legumes in the crop rotation help to control soil blowing and conserve moisture. Capability unit IIIs–1; woodland group 3s2.

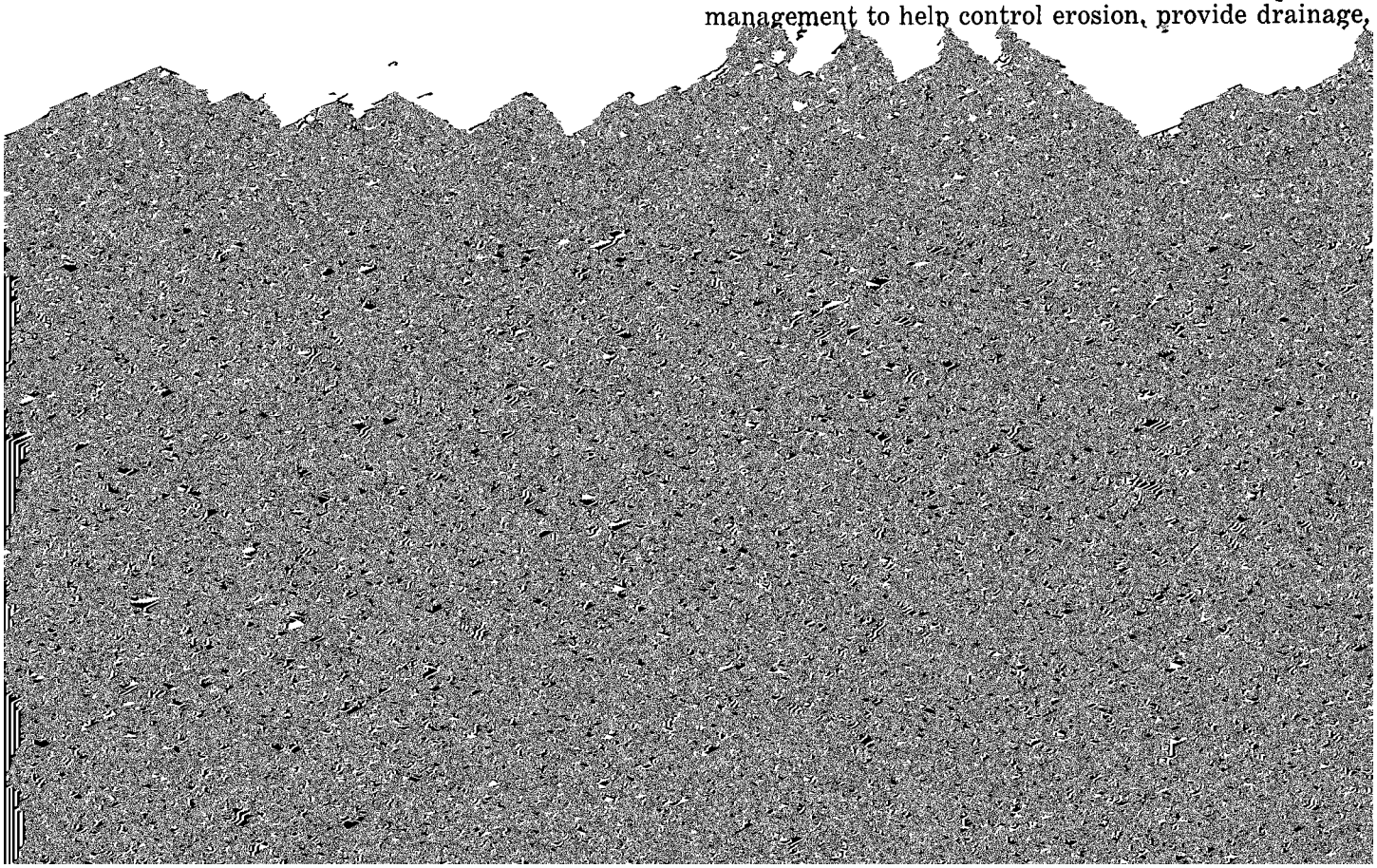
Use and Management of the Soils

In the first part of this section, general guidelines for managing soils for crops and pasture are given. The capability classification used by the Soil Conservation Service is explained, and the capability units in Robeson County are described. Estimated yields of crops under defined management are listed. Then, use of the soils for woodland, wildlife, recreation facilities, and engineering works is discussed.

Use and Management for Crops and Pasture

Land use is fairly consistent throughout the county. Such soil differences as erodibility, wetness, and droughtiness are the major concerns in management. These concerns determine land use patterns on most farms. The differences in the soils are the basis of the capability classification system.

Most soils that are used for cultivated crops need management to help control erosion, provide drainage,



reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops that require special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations for forest trees or for engineering.

Unit I–1. Well-drained, nearly level soils that have a surface layer of fine sandy loam, sandy loam, or loamy sand and a subsoil of sandy loam, sandy clay loam, sandy clay, or clay.

Class II. Soils that have moderate limitations that reduce the choice of plants or require moderate conservation practices.

Subclass IIe. Soils that have a moderate hazard of

Subclass IIIs. Soils that have severe limitations because of low available water capacity.

Unit IIIs–1. Moderately well drained, well drained, and somewhat excessively drained, nearly level to sloping soils that have a surface layer of loamy sand or sand, a subsoil of sandy loam, sandy clay loam, or loamy sand, and underlying material of loamy sand or sand.

Class IV. Soils that have very severe limitations that reduce the choice of plants, require very careful management, or both.

Subclass IVe. Soils subject to very severe erosion if they are cultivated and not protected.

Unit IVe–1. Well-drained, sloping soils that have a surface layer of loamy sand and a subsoil of sandy loam or sandy clay loam.

Subclass IVw. Soils that have very severe limitations because of excess water.

Unit IVw–1. Poorly drained, nearly level soils that have a surface layer of sand or loamy sand and a subsoil of sand or sandy loam.

Unit IVw–2. Poorly drained and very poorly drained, nearly level soils that have a surface layer of loam and a subsoil of clay, sandy clay, sandy clay loam, clay loam, sandy loam, or loam.

Unit IVw–3. Very poorly drained, level and nearly level soils that have a surface layer of mucky loam and organic matter and underlying material of stratified sandy loam, loamy sand, sand, or mucky loam.

Subclass IVs. Soils that have very severe limitations because of low available water capacity.

Unit IVs–1. Excessively drained, nearly level, [illegible]

Unit Vw–1. Poorly drained and very poorly drained, nearly level soils that have a surface layer of sand, loamy sand, sandy loam, or fine sandy loam, either a subsoil of sandy loam, sandy clay loam, sandy clay, or clay or underlying material of sand, sandy loam, or loamy sand.

Class VI. Soils that have severe limitations that make them generally unsuitable for cultivation and that restrict their use largely to pasture, woodland, or wildlife habitat.

Subclass VIw. Soils severely limited by excess water.

Unit VIw–1. Very poorly drained, nearly level soils that have a surface layer of loam and a subsoil of sandy loam.

Class VII. Soils that have very severe limitations that make them unsuitable for cultivation and that restrict their use largely to pasture, woodland, or wildlife habitat.

Subclass VIIw. Soils that have very severe limitations because of excess water.

Unit VIIw–1. Very poorly drained, level or nearly level soils that have a surface layer of organic matter and a subsoil of mucky loam.

Class VIII. Soils and landforms that have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife habitat, or water supply or to esthetic purposes. (None in Robeson County.)

Predicted yields

Table 2 lists predicted yields of the principal crops grown in the county. The predictions are based on

TABLE 2.—*Estimated average acre yields of crops under a high level of management*—Continued

Soil	Corn	Cotton (lint)	Tobacco (flue cured)	Soybeans	Wheat	Oats	Coastal bermudagrass (hay)	Pasture: Fescue and ladino clover	Pasture: Coastal bermudagrass
	Bu	*Lb*	*Lb*	*Bu*	*Bu*	*Bu*	*Tons*	*AUM* [1]	*AUM* [1]
Duplin sandy loam, 2 to 6 percent slopes	100	750	2,800	45	60	75	5.6	-------	14.0
Exum very fine sandy loam, 0 to 1 percent slopes	110	750	2,800	50	60	75	5.8	-------	14.0
Faceville fine sandy loam, 0 to 2 percent slopes	100	750	2,900	40	55	75	5.5	-------	12.0
Faceville fine sandy loam, 2 to 6 percent slopes	90	700	2,700	35	50	75	5.5	-------	12.0
Goldsboro loamy sand, 0 to 2 percent slopes	125	700	3,000	45	60	80	6.0	6.5	11.5
Johns sandy loam	100	650	2,700	40	55	75	5.5	6.5	10.5
Johnston soils	80	-------	-------	40	-------	-------	-------	6.0	-------
Kalmia loamy sand, 0 to 2 percent slopes	110	750	2,900	45	60	80	5.5	-------	10.5
Lakeland sand, 0 to 6 percent slopes	-------	-------	1,500	-------	-------	-------	3.0	-------	6.0
Leon sand	-------	-------	-------	-------	-------	-------	3.0	-------	7.0
Lumbee sandy loam	110	-------	-------	45	-------	70	-------	8.6	-------
Lynchburg sandy loam	100	675	2,700	45	55	75	5.5	12.0	11.0
Marlboro sandy loam, 0 to 2 percent slopes	100	900	2,650	45	65	85	6.5	8.0	11.0
Marlboro sandy loam, 2 to 6 percent slopes	90	800	2,500	40	60	75	6.0	8.0	11.0
McColl loam	85	-------	-------	40	-------	70	-------	7.0	-------
Meggett fine sandy loam	-------	-------	-------	-------	-------	-------	-------	11.0	-------
Nahunta very fine sandy loam	110	675	2,800	45	55	75	5.0	7.5	9.5
Norfolk loamy sand, 0 to 2 percent									

9. Applications of water are timed to meet the need of the soil and the crop.
10. Irrigation systems are properly designed and efficiently used.

Use of the Soils for Woodland [3]

All of Robeson county originally was covered by forests. A wide variety of needleleaf and broadleaf trees grew in these forests. Loblolly pine, longleaf pine, some shortleaf pine, white oak, black oak, post oak,

high potential productivity, 2 indicates high, 3 indicates moderately high, 4 indicates moderate, and 5 indicates low.

The second element in the symbol is a lowercase letter that denotes the soil property that is the primary cause of hazards, limitations, or restrictions of the soils for woodland use or management. The letter *w* indicates excessive wetness. Soils with this designation are those in which excessive water, either seasonal or yearlong, causes significant limitations for woodland use. Such soils have restricted drainage, a seasonal

TABLE 3.—*Woodland management*

Woodland suitability group and map symbols	Potential productivity		Management problems			Preferred trees for planting and management	
	Trees	Site class [1]	Erosion hazard	Equipment restrictions	Seedling mortality	Broadleaf	Needleleaf
Group 1w9: Very poorly drained and poorly drained, nearly level soils that have a loamy and sandy subsoil; on uplands, stream terraces, and flood plains; subject to frequent or very frequent flooding or ponding; very high potential productivity; suited to broadleaf and needleleaf trees.[2] JT, Me, Pg, Pt	Loblolly pine Slash pine Sweetgum Yellow-poplar Water oak Willow oak Cottonwood	100 100 100 100 90–100 100 100	Slight	Severe [3]	Severe [3]	Sweetgum, yellow-poplar, green ash, Shumard oak, cherrybark oak, willow oak, water oak, sycamore, swamp tupelo, water tupelo.	Loblolly pine, slash pine, pond pine, longleaf pine, baldcypress.
Group 2o1: Well-drained, nearly level and gently sloping soils that have a loamy subsoil; on uplands; high potential productivity; best suited to needleleaf trees. AyA, AyB, NoA, NoB	Loblolly pine Slash pine Longleaf pine Southern red oak	90 90 70 80	Slight	Slight	Slight	None recommended.	Loblolly pine, slash pine, longleaf pine.
Group 2o7: Well-drained, nearly level soil that has a loamy subsoil; on stream terraces; subject to rare flooding; high potential productivity; suited to needleleaf and broadleaf trees. KaA	Loblolly pine Slash pine Sweetgum Yellow-poplar	90 90 80–90 100	Slight	Slight	Slight	Yellow-poplar, black walnut, cherrybark oak, Shumard oak, white ash.	Loblolly pine, slash pine, longleaf pine.
Group 2w2: Moderately well drained or somewhat poorly drained, nearly level soil that has a loamy subsoil; on stream terraces; subject to rare flooding; high potential productivity; best suited to needleleaf trees. Jo	Loblolly pine Slash pine Longleaf pine	90 90 70	Slight	Moderate	Moderate	None recommended.	Loblolly pine, slash pine.
Group 2w3: Poorly drained and very poorly drained, nearly level soils that have a loamy and sandy subsoil; on uplands and stream terraces; subject to frequent flooding and ponding; high potential productivity; best suited to needleleaf trees. Pm, Ra, Ru	Loblolly pine Slash pine Pond pine Sweetgum	90 90 70 90	Slight	Severe [3]	Severe [3]	None recommended.	Loblolly pine, slash pine.
Group 2w8: Moderately well drained and somewhat	Loblolly pine Slash pine	90 90	Slight	Moderate	Slight to Mod-	Sweetgum, yellow-poplar,	Loblolly pine, slash pine,

TABLE 3.—*Woodland management*—Continued

Woodland suitability group and map symbols	Potential productivity		Management problems			Preferred trees for planting and management	
	Trees	Site class [1]	Erosion hazard	Equipment restrictions	Seedling mortality	Broadleaf	Needleleaf
Group 2w9: Poorly drained and very poorly drained, nearly level soils that have a loamy, sandy, or clayey subsoil; on uplands, flood plains, and stream terraces; subject to ponding and frequent or very frequent flooding; high potential productivity; suited to broadleaf and needleleaf trees [2]. BB, By, Co, Lu, Mc, To	Loblolly pine Slash pine Longleaf pine Sweetgum	90 90 70 90	Slight	Severe [3]	Severe [3]	Sweetgum, yellow-poplar, cottonwood, willow oak, water oak, Shumard oak, swamp oak, chestnut oak, cherry-bark oak, green ash, sycamore, water tupelo, swamp tupelo.	Loblolly pine, slash pine, longleaf pine, baldcypress.
Group 3o1: Well-drained, nearly level and gently sloping soils that have a clayey and loamy subsoil; on uplands; moderately high potential productivity; best suited to needleleaf trees. FaA, FaB, MaA, MaB	Loblolly pine Slash pine Longleaf pine	80 80 60–70	Slight	Slight	Slight	None recommended.	Loblolly pine, slash pine, longleaf pine.
Group 3s2: Somewhat excessively drained and well-drained, nearly level to sloping soils that have a sandy and loamy subsoil; on uplands; moderately high potential productivity; best suited to needleleaf trees. PoB, WaB, WaC, WkB	Loblolly pine Slash pine Longleaf pine	80 80 60–70	Slight	Moderate	Moderate	None recommended.	Slash pine, loblolly pine, longleaf pine.
Group 3w2: Moderately well drained, nearly level soil that has a sandy subsoil; on uplands and stream terraces; moderately high potential productivity; best suited to needleleaf trees. Pa	Loblolly pine Slash pine Longleaf pine	80 80 70	Slight	Moderate	Moderate	None recommended.	Loblolly pine, slash pine, longleaf pine.
Group 3w9: Poorly drained, nearly level soil that has a loamy subsoil and a hard fragipan above the subsoil; on stream terraces and uplands; subject to ponding; moderately high potential productivity; suited to broadleaf and needleleaf trees [2]. Ta	Loblolly pine Slash pine Longleaf pine Sweetgum Water oak	80 80 70 80 80	Slight	Severe [3]	Severe [3]	Sweetgum, yellow-poplar, green ash, Shumard oak, water oak, swamp tupelo.	Loblolly pine, slash pine, pond pine.
Group 4s2: Excessively drained, nearly level or gently sloping soil that has sandy layers more than 80 inches thick; on uplands and stream terraces; moderate potential productivity; best suited to needleleaf trees. LaB	Slash pine Longleaf pine Loblolly pine	70 60 70	Slight	Moderate	Moderate	None recommended.	Slash pine, loblolly pine.

See footnotes at end of table.

many species of wildlife. Upland game animals such as squirrel, rabbits, quail, deer, mourning dove, fox, and songbirds, are abundant in the county. Furbearers, such as raccoon, muskrat, mink, and opposum, are also abundant. Several species of waterfowl, such as mallards, black ducks, and wood ducks, live along the Lumber River and its tributaries.

In table 4 the suitability of soils mapped in the county is shown for seven elements of wildlife habitat and three kinds of wildlife. In determining suitability of a soil for wildlife, the seven habitat elements are considered first. Then, combinations of habitat elements are used in determining suitability of the soils for the three kinds of wildlife. Such soil properties as thickness of the surface layer and subsoil, flood hazard, drainage, available water capacity, and slope are considered. Suitability is expressed in table 4 as *good*, *fair*, *poor*, or *very poor*. These terms are defined as follows:

Good suitability means that habitats are easily im-

TABLE 4.—*Suitability of the soils for elements*

[See text for explanation

Soil series and map symbols	Elements of wildlife habitat [1]			
	Grain and seeds crops	Domestic grasses and legumes	Wild herbaceous plants	Hardwood trees
Aycock: AyA, AyB	Good	Good	Good	Good
Bibb: BB [2]	Very poor	Poor	Poor	Poor
Byars: By	Very poor	Poor	Poor	Poor
Coxville: Co	Poor	Fair	Fair	Fair
Durham: Du	Fair	Good	Good	Good

proved, maintained, or created; there are few or no soil limitations in habitat management; and satisfactory results can be expected. *Fair* means that habitats can be improved, maintained, or created, but moderate soil limitations affect habitat management or development. A moderate intensity of management and fairly frequent attention may be required to insure satisfactory results. *Poor* means that habitats can be improved, maintained, or created, but the limitations are severe. Habitat management may be difficult and expensive and require intensive effort, and results are questionable. *Very poor* means that it is impractical to improve, maintain, or create habitats. Unsatisfactory results are probable.

The suitabilities given in table 4 can be used as guidelines, but onsite investigation is needed for planning the management of a specific site. The column headings are discussed briefly in the following paragraphs.

of wildlife habitat and kinds of wildlife

of ratings]

Elements of wildlife habitat [1]—Continued			Openland wildlife	Woodland wildlife	Wetland wildlife
Coniferous plants	Wetland plants	Shallow water areas			
Good	Poor	Very poor	Good	Good	Very poor.
Poor	Good	Good	Poor	Poor	Good.
Poor	Good	Good	Poor	Poor	Good.
Fair	Good	Fair	Fair	Fair	Fair.
Good	Fair	Fair	Good	Good	Fair.
Good	Poor	Poor	Good	Good	Poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Poor	Poor	Good	Good	Poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Poor	Poor	Good	Good	Poor.

Grain and seed crops are domestic grains or other seed-producing annuals planted to produce wildlife food. Examples are corn, sorghum, wheat, oats, barley, millet, buckwheat, cowpeas, soybeans, and sunflowers.

Domestic grasses and legumes are domestic perennial grasses and herbaceous legumes that are planted for both food and cover. Examples are fescue, lovegrass, switchgrass, clover, trefoil, and crown vetch.

Wild herbaceous plants are native or naturally established herbaceous grasses and forbs, including weeds, that provide food and cover. Examples are goldenrod, beggarweed, partridgepea, pokeweed, and fescue.

Hardwood trees are nonconiferous trees and associated woody understory plants that provide food and cover for wildlife. Examples are oaks, hickory, autumn-olive, dogwoods, and poplar.

Coniferous plants are cone-bearing trees and shrubs that furnish wildlife cover or supply food in the form of seed or fruitlike cones. Examples are pine and cedar.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist to wet sites but exclude submerged or floating aquatics. These plants produce food and cover principally for wetland forms of wildlife. Examples are arrowhead, wild millet,

Woodland wildlife are birds and mammals that live in areas of hardwoods, coniferous trees, and shrubs. Examples are deer, squirrel, woodpeckers, and gray fox.

Wetland wildlife are birds and mammals that are found primarily in swamps, marshes, or ponds. Examples are muskrat, mink, raccoon, redwing blackbird, and various kinds of ducks.

Use of the Soils for Recreation Development

The amount of land used for recreation is rapidly increasing in Robeson County. Among the larger recreation areas are the Lumbee Recreational Center at Pembroke, Pine Crest County Club at Lumberton, Fairmont Golf Course, Lumber Bridge Golf Course, the Carolina Power and Light Plant lake, and Buies Pond at Philadelphia. Hunting and fishing are extensive in most of the county.

Most of the soils of Robeson County have a potential for one or more kinds of recreation development. Soils on flood plains are well suited to some kinds of recreation because they generally occur as long, winding areas along streams and adjacent to scenic uplands. An onsite assessment of the height, duration, and frequency of flooding should be made in these

TABLE 5.—*Recreation development*—Continued

Soil series	Camp areas	Picnic areas	Playgrounds	Paths and trails
Faceville:				
FaA	Slight	Slight	Slight	Slight.
FaB	Slight	Slight	Moderate: slope	Slight.
Goldsboro: GoA	Slight	Slight	Slight	Slight.
Johns: Jo	Moderate: wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness;

and small camp trailers and for the accompanying activities of outdoor living. Little preparation of the site is required, other than shaping and leveling for tent and parking areas. Camp areas are subject to heavy foot traffic and limited vehicular traffic. The best soils are gently sloping, are not subject to flooding, have a surface that is firm after rains and not dusty when dry, and do not perc slowly (water does not percolate through the soil slowly).

Picnic areas are attractive natural or landscaped tracts that are subject to heavy foot traffic. Most of the vehicular traffic, however, is confined to access roads. The best soils are firm when wet and not dusty when dry, are not subject to flooding during the period of

4. Plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for controlling water and conserving soil.
5. Correlate performance of structures already built with properties of the kinds of soil on which they are built for the purpose of predicting performance of structures on the same or similar kinds of soil in other locations.
6. Predict the trafficability of soils for cross-country movement of vehicles and construction equipment.
7. Develop preliminary estimates pertinent to construction in a particular area.

Most of the information in this section is presented in

gravelly soils of high bearing strength, or the best soils for subgrade (foundation). At the other extreme, in group A–7, are clayey soils that have low strength when wet and that are the poorest soils for subgrade.

Soil test data

Table 6 contains engineering test data for some of the major soils in Robeson County. These tests were made to help evaluate the soils for engineering purposes. The engineering classifications given are based on data obtained by mechanical analyses and by tests to determine liquid limits and plastic limits. The mechanical analyses were made by combined sieve and hydrometer methods.

Moisture-density (or compaction) data are important in earthwork. If a soil material is compacted at successively higher moisture content, assuming that the compactive effort remains constant, the density of the compacted material increases until the *optimum moisture content* is reached. After that, density decreases with increase in moisture content. The highest dry density obtained in the compactive test is termed *maximum dry density*. As a rule, maximum strength of earthwork is obtained if the soil is compacted to the maximum dry density.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a semisolid to a plastic state. If the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material changes from the semisolid to plastic state; and the liquid limit, from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content [illegible]

are also given. For an explanation of these terms, see the section "Engineering Classification Systems."

The columns headed "Percentage passing sieve number" show estimated particle-size distribution according to standard sieve sizes.

In table 8 are estimated physical and chemical properties of the soil. Following are explanations of some of the terms used.

Permeability is that quality of a soil that enables it to transmit water or air. It is estimated on basis of those soil characteristics observed in the field, particularly structure and texture. The estimates in table 8 do not take into account lateral seepage or such transient soil features as plowpans and surface crusts.

Available water capacity is the ability of soils to hold water for use by most plants. It is commonly defined as the difference between the amount of water in the soil at field capacity and the amount at the wilting point of most crop plants. Available water capacity is influenced greatly by soil texture, density, the content of salts, and the content of organic matter.

Reaction is the degree of acidity or alkalinity of a soil, expressed in pH values. The pH values and terms used to describe soil reaction are explained in the Glossary.

Shrink-swell potential is the change in the volume of soil material when the content of moisture changes. It is the extent to which the soil shrinks as it dries out or swells when it gets wet. This shrinking and swelling is influenced by the amount and kind of clay in the soil. Shrinking and swelling of soils cause much damage to building foundations, roads, and other structures. A *high* shrink-swell potential indicates a hazard to maintenance of structures built in, on, or with material having this rating.

Corrosivity pertains to potential soil-induced chemical action that dissolves or weakens uncoated steel or

TABLE 6.—*Engineering*

[Tests performed by the North Carolina Department of Transportation, Division of Highways, according

Soil name and location	Parent material	Report No. S69NC78–	Depth	Moisture-density data [1]	
				Maximum dry density	Optimum moisture
			Inches	*Percent*	*Percent*
Aycock very fine sandy loam: 2 miles southwest of Purvis, ¼ mile west of State Road 1184, and ¼ mile south of State Road 1134, in a cultivated field. (Modal)	Coastal plain sediments.	2–1	0–7	111	11
		2–2	7–38	113	15
		2–4	48–70	110	16
Coxville loam: 1½ miles northeast of Lumberton High School, 800 feet west of State Road 1945, and 75 feet north of farm road. (Modal)	Coastal plain sediments.	3–1	0–8	118	11
		3–3	12–20	114	14
		3–4	20–64	104	20
Norfolk loamy fine sand: ¼ mile northeast of Centerville Church and 125 feet south of State Highway 41. (Modal)	Coastal plain sediments.	5–1	0–10	109	11
		5–4	19–36	114	14
		5–6	58–68	107	18

[1] Based on AASHTO Designation T 99, Method A (*1*).

[2] Mechanical analyses according to AASHTO Designation T 88 (*1*). Results by this procedure may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHTO procedure, the fine material is analyzed by the hydrometer method, and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS procedure, the fine material is analyzed by the pipette method,

TABLE 7.—*Engineering properties and classifications*

[The symbol < means less than. Dashes indicate that data were not estimated]

Soil series and map symbols	Depth	USDA texture	Classification		Percent of material smaller than 3 inches passing sieve—				Liquid limit	Plasticity index
			Unified	AASHTO	No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)		
	Inches								*Percent*	
Aycock: AyA, AyB.	0–7	Very fine sandy loam.	SM, SM–SC, SC, ML, CL, CL–ML	A–4	100	100	80–95	36–55	<25	[1] NP–10
	7–70	Loam, clay	CL	A–6, A–7	100	100	85–100	50–80	30–45	11–25

test data

to procedures of the American Association of State Highway and Transportation Officials (AASHTO) (*1*)]

Mechanical analysis [2]							Liquid limit	Plasticity index	Classification	
Percentage passing sieve—			Percentage smaller than—						AASHTO [3]	Unified [4]
No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)	0.05 mm	0.02 mm	0.005 mm	0.002 mm				

TABLE 7.—*Engineering properties and classifications*—Continued

Soil series and map symbols	Depth	USDA texture	Classification		Percent of material smaller than 3 inches passing sieve—				Liquid limit	Plasticity index
			Unified	AASHTO	No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)		
	Inches								*Percent*	
Kalmia: KaA.	0–10	Loamy sand	SM	A–2	100	95–100	65–90	15–30	-----	NP
	10–36	Sandy loam, sandy clay loam.	SM–SC, SC, SM	A2, A–4	100	90–100	70–90	30–50	15–35	4–10
	36–68	Coarse sand	SP–SM, SM	A–2	100	90–100	50–70	10–15	-----	NP
Lakeland: LaB.	0–90	Sand	SP–SM	A–3	100	100	50–70	5–10	-----	NP
Leon: Le.	0–82	Sand	SP, SP–SM	A–2, A–3	100	100	80–100	2–12	-----	NP
Lumbee: Lu.	0–13	Sandy loam	SM	A–2	100	100	60–70	20–35	-----	NP
	13–36	Sandy clay loam, sandy loam.	SM–SC, SC	A–4, A–6	100	100	70–90	36–49	15–35	4–15
	36–73	Loamy sand	SP–SM, SM	A–2, A–3	100	90–100	60–80	5–25	-----	NP
Lynchburg: Ly.	0–7	Sandy loam	SM, SM–SC, SC	A–2, A–4	100	100	70–95	25–45	8–20	2–10
	7–68	Sandy clay loam.	SM–SC, SC, CL–ML, CL	A–4, A–6	100	100	75–95	36–55	15–40	4–17
Marlboro: MaA, MaB.	0–9	Sandy loam	SM	A–2, A–4	100	100	70–90	20–45	-----	NP
	9–63	Sandy clay, sandy clay loam.	CL	A–6, A–7	100	100	80–100	50–70	25–45	11–25
	63–75	Sandy loam	SM, SM–SC, SC	A–2, A–4	100	100	70–100	25–50	10–20	2–10
McColl: Mc.	0–4	Loam	CL–ML, CL	A–4	100	95–100	85–95	50–70	15–30	4–10
	4–18	Sandy clay	SC, CL	A–6, A–7	100	95–100	75–90	40–75	30–45	11–25
	18–51	Sandy clay loam.	SC	A–4, A–6	100	95–100	80–90	35–50	20–40	8–20
	51–64	Sandy loam, sandy clay loam.	SC, SM–SC	A–4, A–6	100	95–100	60–80	36–50	20–40	5–20
Meggett: Me.	0–10	Fine sandy loam.	SM	A–4	100	100	90–100	40–50	-----	NP
	10–41	Sandy clay, clay.	SC, CL, MH, CH	A–7	100	100	90–100	45–80	40–70	25–40
	41–55	Loamy fine sand, sand.	SM	A–2	100	100	30–70	15–30	-----	NP
Nahunta: Na.	0–10	Loam, very fine sandy loam.	ML, CL–ML, CL	A–4	100	100	85–95	50–65	10–25	2–10
	10–64	Clay loam	ML, CL	A–6, A–7	100	100	90–100	65–80	20–45	10–20
Norfolk: NoA, NoB, NsC. For the Faceville part of NsC, see the Faceville series.	0–17	Loamy sand, sandy loam.	SM	A–2, A–4	100	100	50–95	16–40	-----	NP
	17–82	Sandy clay loam.	SM–SC, SC	A–2, A–4, A–6	100	100	80–90	30–49	20–40	4–17
Osier. Mapped only with Plummer soils.	0–75	Sand	SP–SM, SM	A–2	100	100	95–100	10–15	-----	NP
Pactolus: Pa.	0–36	Loamy sand	SM	A–2	100	100	50–75	15–30	-----	NP
	36–72	Sand	SM, SP–SM	A–2, A–3	100	100	50–70	5–15	-----	NP
Pantego: Pg.	0–14	Fine sandy loam.	SM, SM–SC	A–4	100	100	70–85	40–49	10–20	2–7
	14–80	Sandy clay loam.	SM–SC, SC, ML, CL–ML, CL, SM	A–2, A–4, A–6	100	100	80–90	35–55	20–40	5–15

TABLE 7.—*Engineering properties and classifications*—Continued

Soil series and map symbols	Depth	USDA texture	Classification		Percent of material smaller than 3 inches passing sieve—				Liquid limit	Plasticity index
			Unified	AASHTO	No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)		
	Inches								*Percent*	
Plummer: Pm. For the Osier part of Pm, see the Osier series.	0–13	Loamy sand	SM	A–2	100	100	50–75	15–30	-----	NP
	13–56	Sand	SP–SM, SM	A–2, A–3	100	100	50–70	5–15	-----	NP
	56–65	Sandy loam	SM	A–2, A–4	100	100	60–70	30–40	<10	NP–4
Pocalla: PoB.	0–22	Loamy sand, sand.	SM, SP–SM	A–2, A–3	100	100	50–75	5–30	-----	NP
	22–47	Sandy loam, loamy sand.	SM	A–2, A–4	100	100	50–75	15–40	-----	NP
	47–72	Sandy clay loam.	SM–SC, SC	A–2, A–4, A–6	100	100	80–90	35–49	10–35	4–17
Ponzer: Pr.	0–31	Muck	Pt	------	------	------	------	------	------	------
	31–42	Clay loam	CL	A–6	100	100	90–100	70–80	20–40	10–20
	42–47	Sandy loam, loamy sand.	SM	A–2, A–4	100	100	50–75	15–40	-----	NP
	47–60	Sand	SM, SP–SM	A–2, A–3	100	90–100	50–70	5–15	-----	NP
Portsmouth: Pt.	0–16	Loam, sandy loam.	ML, CL–ML, CL	A–4, A–6	100	100	60–95	50–75	<25	NP–15
	16–56	Sandy loam, sandy clay loam.	SM, SM–SC, SC	A–2, A–4, A–6	100	100	60–90	30–49	10–35	3–17
	56–62	Loamy sand, sand.	SM, SP–SM	A–2, A–3	100	100	50–75	5–30	-----	NP
Rains: Ra.	0–7	Sandy loam	SM–SC, SC, CL, CL–ML	A–4	100	100	70–80	40–55	10–25	5–10
	7–62	Sandy clay	SM–SC, SC	A–2, A–4	100	100	85–100	35–55	20–40	4–17

TABLE 7.—*Engineering properties and classifications*—Continued

Soil series and map symbols	Depth	USDA texture	Classification		Percent of material smaller than 3 inches passing sieve—				Liquid limit	Plasticity index
			Unified	AASHTO	No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)		
	Inches								*Percent*	
Wakulla: WkB.	0–24	Sand	SP–SM, SM	A–3, A–2	100	100	50–70	5–15	-----	NP
	24–42	Loamy sand	SM	A–2	100	100	50–75	15–30	-----	NP
	42–83	Sand	SP–SM, SM	A–3, A–2	100	100	50–70	5–15	-----	NP

[1] NP means nonplastic.

TABLE 8.—*Estimated physical and chemical properties*

[Dashes mean that properties were not estimated]

Soil series and map symbols	Depth	Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosivity to	
						Steel	Concrete
	Inches	*Inches per hour*	*Inches per inch of soil*	*pH*			
Aycock: AyA, AyB.	0–7	2.0–6.0	0.13–0.20	5.1–6.5	Low	Moderate	Moderate.
	7–70	0.6–2.0	0.15–0.20	5.1–5.5	Moderate	----------	----------
	70–100	0.6–2.0	0.10–0.14	5.1–5.5	Low	----------	----------
Bibb: BB.	0–26	2.0–6.0	0.10–0.14	4.5–5.0	Low	High	High.
	26–64	2.0–6.0	0.05–0.10	4.5–5.0	Low	----------	----------
Byars: By.	0–15	0.06–0.2	0.15–0.20	4.5–5.0	Low	High	High.
	15–64	0.06–0.2	0.12–0.18	4.5–5.0	High	----------	----------
Coxville: Co.	0–8	0.6–2.0	0.15–0.20	4.5–5.5	Low	High	High.
	8–80	0.2–0.6	0.12–0.18	4.5–5.5	Moderate	----------	----------
Dunbar: Dn.	0–8	2.0–6.0	0.10–0.14	4.5–5.5	Low	High	High.
	8–92	0.2–0.6	0.14–0.18	4.5–5.5	Moderate	----------	----------
Duplin: DpA, DpB.	0–8	2.0–6.0	0.10–0.14	4.5–7.3	Low	High	High.
	8–100	0.2–0.6	0.14–0.18	4.5–5.0	Moderate	----------	----------
Exum: ExA.	0–9	2.0–6.0	0.13–0.20	4.5–6.5	Low	Moderate	Moderate.
	9–80	0.6–2.0	0.15–0.20	4.5–5.5	Low	----------	----------
Faceville: FaA, FaB.	0–6	2.0–6.0	0.11–0.15	4.5–6.0	Low	High	High.
	6–70	0.6–2.0	0.12–0.18	4.5–5.5	Moderate	High	High.
Goldsboro: GoA.	0–10	2.0–6.0	0.06–0.10	4.5–6.0	Low	Moderate	High.
	10–70	0.6–2.0	0.12–0.17	4.5–5.0	Low	----------	----------
Johns: Jo.	0–9	2.0–6.0	0.10–0.14	4.5–5.5	Low	Moderate	High.
	9–39	0.6–2.0	0.12–0.15	4.5–5.5	Low	----------	----------
	39–60	6.0–20	0.03–0.08	4.5–5.5	Low	----------	----------
Johnston: JT.	0–32	0.6–2.0	0.15–0.20	4.5–5.5	Low	High	High.
	32–60	2.0–6.0	0.05–0.10	4.5–5.5	Low	----------	----------
Kalmia: KaA.	0–10	2.0–6.0	0.06–0.10	4.5–6.5	Low	Moderate	High.
	10–36	0.6–2.0	0.12–0.17	4.5–5.5	Low	----------	----------
	36–68	6.0–20	0.02–0.04	4.5–5.5	Low	----------	----------
Lakeland: LaB.	0–90	6.0–20	0.02–0.05	4.5–6.0	Low	Low	High.
Leon: Le.	0–82	0.6–2.0	0.01–0.06	4.0–5.0	Low	High	High.
Lumbee: Lu.	0–13	2.0–6.0	0.10–0.14	4.5–6.0	Low	High	High.
	13–36	0.6–2.0	0.12–0.17	4.5–5.5	Low	----------	----------
	36–73	6.0–20	0.06–0.10	4.5–5.5	Low	----------	----------
Lynchburg: Ly.	0–7	2.0–6.0	0.10–0.14	4.5–5.5	Low	High	High.
	7–68	0.6–2.0	0.12–0.17	4.5–5.5	Low	----------	----------

TABLE 8.—*Estimated physical and chemical properties*—Continued

Soil series and map symbols	Depth	Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosivity to Steel	Corrosivity to Concrete
	Inches	*Inches per hour*	*Inches per inch of soil*	*pH*			
Marlboro: MaA, MaB.	0–9	2.0–6.0	0.10–0.14	4.5–6.0	Low	High	High.
	9–63	0.6–2.0	0.14–0.18	4.5–5.5	Low		
	63–75	2.0–6.0	0.10–0.14	4.5–5.5	Low		
McColl: Mc.	0–4	0.6–2.0	0.15–0.20	4.5–5.5	Low	High	High.
	4–18	0.2–0.6	0.12–0.17	4.5–5.5	Low		
	18–51	0.06–0.2		4.5–5.5	Low		
	51–64	2.0–6.0		4.5–5.5	Low		
Meggett: Me.	0–10	2.0–6.0	0.11–0.15	5.6–6.0	Low	High	Low.
	10–41	0.06–0.2	0.12–0.18	6.6–8.4	High		
	41–55	6.0–20	0.06–0.10	6.6–8.4	Low		
Nahunta: Na.	0–10	2.0–6.0	0.15–0.17	4.5–5.5	Low	High	High.
	10–64	0.6–2.0	0.15–0.20	4.5–5.5	Low		
Norfolk: NoA, NoB, NsC. For the Faceville part of NsC, see the Faceville series.	0–17	2.0–6.0	0.06–0.10	4.5–6.0	Low	Moderate	High.
	17–82	0.6–2.0	0.12–0.15	4.5–5.5	Low		
Osier. Mapped only with Plummer soils.	0–75	6.0–20	0.02–0.05	4.5–6.0	Low	High	High.
Pactolus: Pa.	0–36	6.0–20	0.05–0.09	4.5–5.5	Low	Moderate	High.
	36–72	6.0–20	0.03–0.06	4.5–5.5	Low		
Pantego: Pg.	0–14	2.0–6.0	0.11–0.15	4.5–6.0	Low	Moderate	High.
	14–80	0.6–2.0	0.12–0.17	4.5–5.5	Low		
Plummer: Pm. For the Osier part of Pm, see the Osier series.	0–13	2.0–6.0	0.05–0.09	4.5–5.5	Low	High	High.
	13–56	2.0–20	0.02–0.06	4.5–5.5	Low		
	56–65	2.0–6.0	0.10–0.14	4.5–5.5	Low		
Pocalla: PoB.	0–22	6.0–20	0.03–0.08	4.5–6.0	Low	Low	High.
	22–47	0.6–6.0	0.07–0.14	4.5–5.5	Low		
	47–72	0.6–2.0	0.12–0.17	4.5–5.5	Low		
Ponzer: Pr.	0–31	0.6–2.0	0.24–0.26	4.0–5.0	(1)	High	High.
	31–42	0.6–2.0	0.15–0.20	4.0–5.0	Moderate		
	42–47	0.6–6.0	0.07–0.13	4.0–5.0	Low		
	47–60	6.0–20	0.02–0.06	4.0–5.0	Low		
Portsmouth: Pt.	0–16	0.6–6.0	0.14–0.18	4.5–5.5	Low	High	High.
	16–56	0.6–2.0	0.12–0.17	4.5–5.5	Low		
	56–62	6.0–20	0.03–0.07	4.5–5.5	Low		
Rains: Ra.	0–7	2.0–6.0	0.10–0.15	4.0–5.5	Low	High	High.
	7–62	0.6–2.0	0.10–0.14	4.5–5.5	Low		
	62–72	2.0–6.0	0.10–0.14	4.5–5.5	Low		
Rutlege: Ru.	0–72	6.0–20	0.03–0.05	4.5–5.5	Low	High	High.
Toisnot: Ta.	0–13	2.0–6.0	0.07–0.12	4.5–5.5	Low	High	High.
	13–28	0.06–.20	0.06–0.14	4.5–5.5	Low		
	28–45	0.06–.20		4.5–5.5	Low		
	45–80	.20–2.0		4.5–5.5	Low		
Torhunta: To.	0–9	2.0–6.0	0.10–0.15	4.5–6.5	Low	High	High.
	9–64	2.0–6.0	0.07–0.11	4.5–5.5	Low		
Trebloc: Tr.	0–19	0.6–2.0	0.16–0.20	4.5–5.5	Low	High	High.
	19–84	0.06–0.6	0.12–0.18	4.5–5.5	Moderate		
Udorthents, loamy: Ud. Properties are too variable to be estimated.							
Wagram: WaB, WaC.	0–28	2.0–6.0	0.06–0.10	4.5–5.5	Low	Low	High.
	28–78	2.0–6.0	0.08–0.13	4.5–5.5	Low		
	78–100	2.0–6.0	0.06–0.10	4.5–5.5	Low		

See footnotes at end of table.

TABLE 8.—*Estimated physical and chemical properties*—Continued

						Corrosivity to

likely in the usual weather. Common flooding may be further described as *occasional* if it occurs once in 2 years or less on the average, or *frequent* if it occurs more than once in 2 years. Duration of flooding is expressed as *very brief*, if less than 2 days, *brief*, if 2 to 7 days, or *long*, if 7 days or longer. Time of flooding is given in table 9 as the months when flooding normally happens.

Information given for high water tables includes the distance from the surface of the soil to the highest

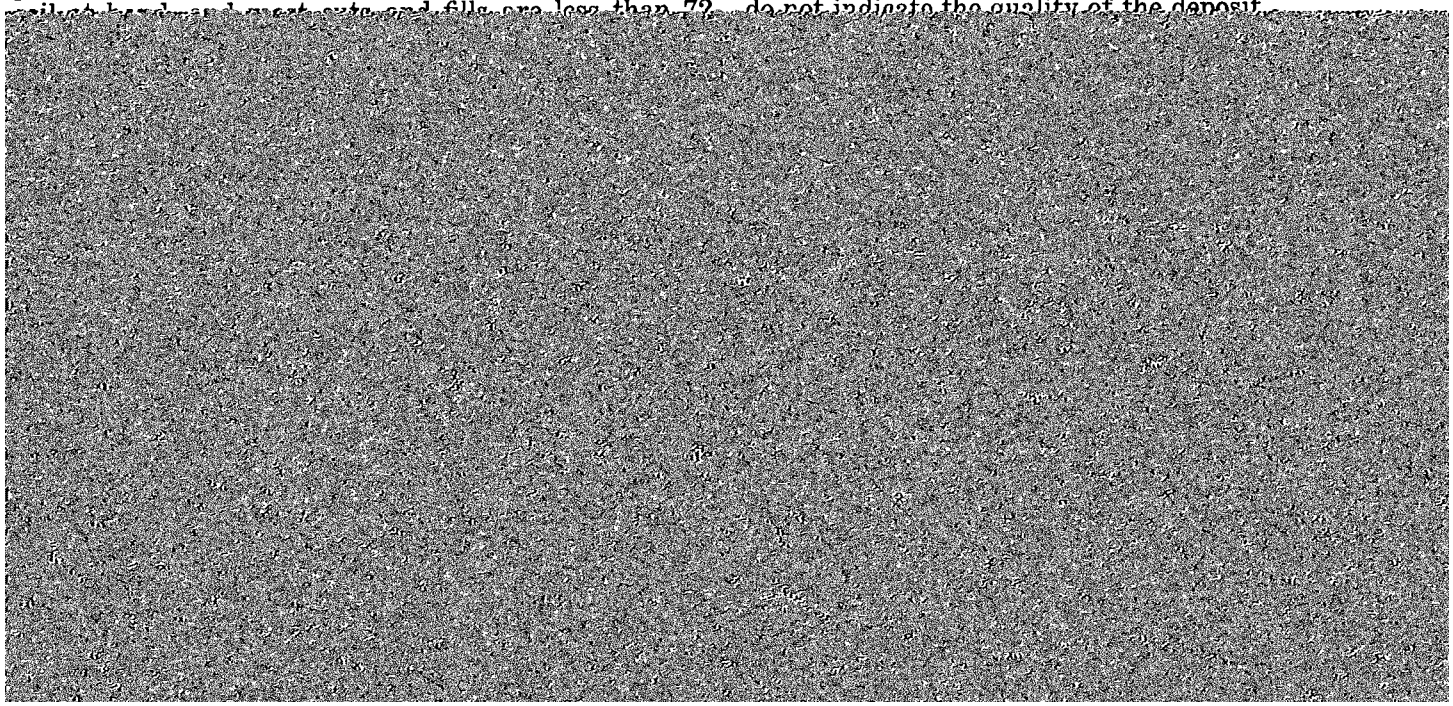
permeability, content of organic matter, slope, and, if the floor needs to be leveled, depth to bedrock. The soil characteristics that commonly affect embankments are shear strength, compressibility, permeability of the compacted soil, susceptibility to piping, compactibility, and the amount of stones. Stones influence the ease of excavation and the ease of compaction of the embankment material.

Sanitary landfill is used to dispose of refuse. The waste is spread in thin layers, compacted, and covered

Figure 11.—**Flooding in an area of Johns sandy loam.**

expected to carry automobile traffic all year. These roads and streets have a subgrade of underlying soil material; a base consisting of gravel, crushed rock, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. They are graded to shed water and have ordinary provisions for drainage. They are built mainly from soil at hand and must cuts and fills are less than 72

guidance about where to look for probable sources of sand and gravel. A soil rated as a *good* or *fair* source generally has a layer of sand or gravel at least 36 inches thick, the top of which is within a depth of 72 inches. The ratings do not take into account thickness of overburden, location of the water table, or other factors that affect mining of the materials, and they do not indicate the quality of the deposit.



lowing are explanations of the columns in that table.

Pond reservoir areas hold water behind a dam or embankment. Soils suitable for use as pond reservoir areas have low seepage, which is related to their permeability and depth to fractured or permeable bedrock or other permeable material.

Embankments, dikes, and levees require soil material that is resistant to seepage and piping and that has favorable stability, shrink-swell potential, shear strength, and compactibility. Stones or organic matter in a soil are limitations to the use of a soil for embankments, dikes, and levees.

Drainage of soils is affected by such features as permeability; texture; structure; depth to cemented pan, rock, or other layers that influence rate of water movement; depth of the water table; slope; stability of ditchbanks; susceptibility to stream overflow; salinity and alkalinity; and availability of outlets for drainage.

Irrigation is affected by such features as slope; susceptibility to flooding, water erosion, and soil blowing; texture; content of stones; accumulation of salts and alkali; depth of the root zone; rate of water intake at the surface; permeability of the soil below the surface; available water capacity; need for drainage; depth of the water table; and depth to bedrock.

Terraces and diversions are low ridges constructed across a slope to intercept runoff and allow it to soak into the soil or flow slowly to a prepared outlet. Features that affect suitability of a soil for terraces and diversions are uniformity and steepness of slope, depth to bedrock or other unfavorable material, stoniness, permeability, and resistance to water erosion, soil slipping, and soil blowing. A suitable soil provides outlets for runoff and is not difficult to vegetate.

Grassed waterways are used to carry runoff water safely to outlets. The features that affect the use of soils for waterways are permeability, erodibility, and suitability for permanent vegetation.

Formation and Classification of the Soils

In this section the factors of soil formation are described and the effect these factors have had on the soils of Robeson County is discussed. The current system of soil classification is explained and the soil series are placed in higher categories of classification. The soil series, including a description of a representative profile for each series, are described in the section, "Descriptions of the Soils."

TABLE 10.—*Sanitary facilities*

["Percs slowly" and some of the other terms that describe restrictive soil features are defined in the Glossary. See text for definitions for "slight," "moderate," and "severe"]

Soil series and map symbols	Septic tank absorption fields	Sewage lagoons	Sanitary landfill (trench)	Sanitary landfill (area)
Aycock:				
AyA	Moderate: percs slowly.	Moderate: percs slowly.	Slight	Slight.
AyB	Moderate: percs slowly.	Moderate: slope; seepage.	Slight	Slight.
Bibb: BB	Severe: wetness; floods.	Severe: wetness; floods.	Severe: wetness; floods.	Severe: wetness floods.
Byars: By	Severe: wetness; floods.	Moderate: excess humus.	Severe: wetness; floods.	Severe: wetness; floods.
Coxville: Co	Severe: wetness; floods; percs slowly.	Severe: wetness; floods.	Severe: wetness; floods.	Severe: wetness; floods.
Dunbar: Dn	Severe: wetness; percs slowly.	Severe: wetness	Severe: wetness	Severe: wetness.
Duplin: DpA, DpB	Severe: wetness; percs slowly.	Severe: wetness	Moderate: too clayey; wetness.	Moderate: wetness.
Exum: ExA	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.
Faceville:				
FaA	Slight	Moderate: seepage	Moderate: too clayey	Slight.
FaB	Slight	Moderate: slope; seepage.	Moderate: too clayey	Slight.
Goldsboro: GoA	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.
Johns: Jo	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.
Johnston: JT	Severe: wetness; floods.	Severe: wetness; floods.	Severe: wetness; floods.	Severe: wetness; floods.
Kalmia: KaA	Slight	Moderate: seepage	Slight	Slight.
Lakeland: LaB	Slight	Severe: seepage	Severe: too sandy; seepage.	Severe: seepage.
Leon: Le	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.
Lumbee: Lu	Severe: wetness; floods.	Severe: wetness; floods.	Severe: wetness	Severe: wetness.
Lynchburg: Ly	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.

TABLE 10.—*Sanitary facilities*—Continued

Soil series and map symbols	Septic tank absorption fields	Sewage lagoons	Sanitary landfill (trench)	Sanitary landfill (area)
MaB	Moderate: percs slowly.	Moderate: slope; seepage.	Moderate: too clayey	Slight.
McColl: Mc	Severe: percs slowly; wetness; floods.	Slight	Severe: wetness; floods.	Severe: wetness; floods.
Meggett: Me	Severe: percs slowly; wetness; floods.	Severe: wetness	Severe: wetness; too clayey; floods.	Severe: wetness; floods.
Nahunta: Na	Severe: wetness	Severe: wetness	Moderate: wetness	Severe: wetness.
Norfolk:				
NoA	Slight	Moderate: seepage	Slight	Slight.
NoB	Slight	Moderate: slope; seepage.	Slight	Slight.
NsC:				
Norfolk part	Moderate: slope	Severe: slope	Slight	Moderate: slope.
Faceville part	Moderate: slope	Severe: slope	Moderate: too clayey	Moderate: slope.
Pactolus: Pa	Severe: wetness	Severe: wetness; seepage.	Severe: seepage	Severe: seepage.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE 11.—*Construction sites*—Continued

Soil series and map symbols	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Roads and streets
Duplin:					
DpA	Moderate: too clayey; wetness.	Moderate: shrink-swell.	Moderate: wetness; shrink-swell.	Moderate: wetness; shrink-swell.	Severe: low strength.
DpB	Moderate: too clayey; wetness.	Moderate: shrink-swell.	Moderate: wetness; shrink-swell.	Moderate: slope; shrink-swell.	Severe: low strength.
Faceville:					
FaA	Moderate: too clayey.	Moderate: shrink-swell; low strength.	Moderate: shrink-swell; low strength.	Moderate: shrink-swell; low strength.	Severe: low strength.
FaB	Moderate: too clayey.	Moderate: shrink-swell; low strength.	Moderate: shrink-swell; low strength.	Moderate: shrink-swell; slope; low strength.	Severe: low strength.
Goldsboro: GoA	Moderate: wetness.	Slight	Moderate: wetness.	Moderate: wetness.	Slight.
Johns: Jo	Severe: wetness; cutbanks cave.	Severe: floods	Severe: wetness; floods.	Severe: wetness; floods.	Moderate: wetness.
Johnston: JT	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.
Kalmia: KaA	Moderate: cutbanks cave; floods.	Severe: floods	Severe: floods	Severe: floods	Slight.
Lakeland: LaB	Severe: cutbanks cave.	Slight	Slight	Slight	Slight.
Leon: Le	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.
Lumbee: Lu	Severe: wetness; floods.	Severe: wetness; floods.	Severe: wetness; floods.	Severe: wetness; floods.	Severe: wetness.
Lynchburg: Ly	Severe: wetness	Moderate: wetness.	Severe: wetness	Severe: wetness	Moderate: wetness.
Marlboro:					
MaA	Moderate: too clayey.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.
MaB	Moderate: too clayey.	Moderate: low strength.	Moderate: low strength.	Moderate: slope; low strength.	Moderate: low strength.
McColl: Mc	Severe: wetness; cemented pan.	Severe: wetness; floods.	Severe: wetness; floods.	Severe: wetness; floods.	Severe: wetness; floods.
Meggett: Me	Severe: wetness; too clayey.	Severe: wetness; shrink-swell; floods.	Severe: wetness; shrink-swell; floods.	Severe: wetness; shrink-swell; floods.	Severe: wetness; shrink-swell; floods.
Nahunta: Na	Severe: wetness	Moderate: wetness.	Severe: wetness	Severe: wetness	Severe: low strength.
Norfolk:					
NoA	Slight	Slight	Slight	Slight	Slight.
NoB	Slight	Slight	Slight	Moderate: slope	Slight.
NsC:					
Norfolk part	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope.
Faceville part	Moderate: slope; too clayey.	Moderate: shrink-swell; low strength; slope.	Moderate: shrink-swell; low strength; slope.	Severe: slope	Severe: low strength.
Pactolus: Pa	Severe: wetness; cutbanks cave.	Moderate: wetness.	Severe: wetness	Severe: wetness	Moderate: wetness.

TABLE 11.—*Construction sites*—Continued

Soil series and map symbols	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Roads and streets
Trebloc: Tr	Severe: wetness; floods.	Severe: wetness; floods.	Severe: wetness; floods.	Severe: wetness; floods.	Severe: wetness; floods.
Udorthents, loamy: Ud. Too variable to be rated.					
Wagram:					
WaB	Slight	Slight	Slight	Slight	Slight.
WaC	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope.
Wakulla: WkB	Severe: cutbanks cave.	Slight	Slight	Slight	Slight.

TABLE 12.—*Construction material*

["Low strength" and some of the other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," and "unsuited"]

Soils series and map symbols	Road fill	Sand	Gravel	Topsoil	Daily cover for landfill
Aycock: AyA, AyB	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer	Fair: too clayey.
Bibb: BB	Poor: wetness	Poor: excess fines	Unsuited: excess fines.	Poor: wetness	Poor: wetness.
Byars: By	Poor: wetness	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness	Poor: wetness.
Coxville: Co	Poor: wetness	Poor: excess fines	Unsuited: excess fines.	Poor: wetness	Poor: wetness.
Dunbar: Dn	Poor: low strength; wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer	Fair: too clayey.
Duplin: DpA, DpB	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer	Fair: too clayey.
Exum: ExA	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer	Fair: too clayey.
Faceville: FaA, FaB	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer	Poor: too clayey.
Goldsboro: GoA	Good	Unsuited: excess fines.	Unsuited: excess fines.	Good	Good.
Johns: Jo	Fair: wetness	Poor: excess fines	Unsuited: excess fines.	Fair: thin layer	Good.
Johnston: JT	Poor: wetness	Poor: excess fines	Poor: excess fines	Poor: wetness	Poor: wetness.
Kalmia: KaA	Good	Poor: excess fines	Unsuited: excess fines.	Fair: too sandy; thin layer.	Good.
Lakeland: LaB	Good	Good	Unsuited: excess fines.	Poor: too sandy	Poor: too sandy.
Leon: Le	Poor: wetness	Poor: excess fines	Unsuited: excess fines.	Poor: wetness	Poor: wetness.
Lumbee: Lu	Poor: wetness	Poor: excess fines	Unsuited: excess fines.	Poor: wetness	Poor: wetness.
Lynchburg: Ly	Fair: wetness	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer	Good.
Marlboro: MaA,	Fair: low	Unsuited: excess	Unsuited: excess	Fair: thin layer	Fair: too clayey.

TABLE 12.—*Construction material*—Continued

Soils series and map symbols	Road fill	Sand	Gravel	Topsoil	Daily cover for landfill
Pantego: Pg	Poor: wetness	Poor: excess fines	Unsuited: excess fines.	Poor: wetness	Poor: wetness.
Plummer:					
Pm:					
Plummer part	Poor: wetness	Poor: excess fines	Unsuited: excess fines.	Poor: wetness; too sandy.	Poor: wetness; too sandy.
Osier part	Poor: wetness	Fair: excess fines	Unsuited: excess fines.	Poor: wetness; too sandy.	Poor: wetness; too sandy.
Pocalla: PoB	Good	Fair: excess fines	Poor: excess fines	Poor: too sandy	Poor: too sandy.
Ponzer: Pr	Poor: wetness; excess humus; low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness	Poor: excess humus; wetness; hard to pack.
Portsmouth: Pt	Poor: wetness	Poor: excess fines	Unsuited: excess fines.	Poor: wetness	Poor: wetness.
Rains: Ra	Poor: wetness	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness	Poor: wetness.
Rutlege: Ru	Poor: wetness	Poor: excess fines	Unsuited: excess fines.	Poor: wetness	Poor: wetness.
Toisnot: Ta	Poor: wetness	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness	Poor: wetness.
Torhunta: To	Poor: wetness	Poor: excess fines	Unsuited: excess fines.	Poor: wetness	Poor: wetness.
Trebloc: Tr	Poor: wetness; low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness	Poor: wetness.
Udorthents, loamy:					
Ud.					
Too variable to be rated.					
Wagram:					
WaB	Good	Poor: excess fines	Unsuited: excess fines.	Poor: too sandy	Good.
WaC	Good	Poor: excess fines	Unsuited: excess fines.	Poor: too sandy	Fair: slope.
Wakulla: WkB	Good	Fair: excess fines	Unsuited: excess fines.	Poor: too sandy	Fair: too sandy.

TABLE 13.—*Water management*

["Piping" and some of the other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe"]

Soil series and map symbols	Limitations for—		Features affecting—			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Aycock:						
AyA	Slight	Moderate: piping.	Not needed	Favorable	Not needed	Favorable.
AyB	Slight	Moderate: piping.	Not needed	Favorable	Favorable	Favorable.
Bibb: BB	Moderate: seepage.	Moderate: seepage; piping.	Wetness; floods; poor outlets.	Wetness; floods	Not needed	Not needed.
Byars: By	Slight	Moderate: compressible; shrink-swell.	Wetness; percs slowly.	Wetness; percs slowly.	Not needed	Not needed.
Coxville: Co	Slight	Moderate: compressible.	Percs slowly	Wetness	Not needed	Not needed.
Dunbar: Dn	Moderate: seepage.	Moderate: compressible.	Percs slowly	Wetness	Not needed	Not needed.
Duplin:						
DpA	Moderate: seepage.	Slight	Favorable	Wetness	Not needed	Favorable.
DpB	Moderate: seepage.	Slight	Slope	Favorable	Favorable	Favorable.
Exum: ExA	Slight	Moderate: low strength.	Favorable	Favorable	Not needed	Favorable.

TABLE 13.—*Water management*—Continued

Soil series	Limitations for—		Features affecting—			
	Pond reservoir	Embankments, dikes, and			Terraces and	Grassed

TABLE 13.—*Water management*—Continued

Soil series and map symbols	Limitations for— Pond reservoir areas	Embankments, dikes, and levees	Features affecting— Drainage	Irrigation	Terraces and diversions	Grassed waterways
Torhunta: To	Severe: seepage.	Moderate: piping.	Poor outlets; cutbanks cave.	Wetness	Not needed	Not needed.
Trebloc: Tr	Slight	Moderate: erodes easily; unstable fill.	Wetness; poor outlets.	Wetness	Not needed	Not needed.
Udorthents, loamy: Ud. Too variable to be rated.						
Wagram:						
WaB	Severe: seepage.	Moderate: piping.	Not needed	Fast intake	Favorable	Favorable.
WaC	Severe: seepage.	Moderate: piping.	Not needed	Fast intake; slope.	Slope	Slope.
Wakulla: WkB	Severe: seepage.	Severe: seepage.	Not needed	Fast intake; seepage.	Too sandy	Not needed.

Factors of Soil Formation

Soils are formed by processes of the environment acting upon soil materials that are deposited or accumulated by geologic agents. The characteristics of a soil at any given point are determined by (1) the physical and mineralogical composition of the parent material; (2) the climate under which the soil material accumulated and has existed since it accumulated; (3) the plants and animals in and on the soil; (4) the relief or lay of the land that influences drainage; and (5) the length of time these processes have acted on the soil material. All of these factors have influenced the formation of each soil in Robeson County and throughout the world.

The relative importance of each factor differs from place to place. In some areas one factor can be more important than the other, and in a few places one factor may dominate in the formation of a soil and determine most of its properties, as is common when the parent material is pure quartz sand. Quartz sand is highly resistant to weathering, and the soils formed in it generally have faint horizons. Even in quartz sand, however, a distinct profile can form under certain kinds of vegetation if the relief is low and flat and the water table is high.

Parent material

The parent materials of the soils of Robeson County are unconsolidated rock material, sand, silt, and clay that make up the sediments on the Coastal Plain uplands and soil material washed from the Coastal Plain uplands and deposited in drainageways on flood plains or terraces as alluvium. Both kinds of parent material are closely related. In some places the material has also been moved by wind or gravity.

The parent materials in the county differ in mineral and chemical composition and in physical makeup in the field. More obscure differences, such as mineral composition, can be determined only by careful laboratory examination.

Many of the differences among the soils of Robeson County reflect the varying geologic materials from which the soils formed. Lakeland, Leon, Pactolus, and Wakulla soils formed in sediments mostly of sand. Aycock, Exum, Nahunta and Trebloc soils formed in sediments that have a high content of very fine sand and silt. Norfolk, Goldsboro, Lynchburg, and Rains soils formed in sediments that have a low content of silt and very fine sand and a moderate amount of sand and clay. Marlboro, Duplin, Dunbar, and Coxville soils formed in sediments that have a high content of clay. Bibb and Johnston soils formed in alluvial deposits on flood plains, and Kalmia, Johns, Lumbee, and Portsmouth soils formed in alluvial deposits on stream terraces.

Climate

Climate, primarily rainfall and temperature, affects the physical and chemical weathering and the biological forces that work on the soil material. The climate in Robeson County is warm and humid. The average annual temperature is about 63° F., and the average annual rainfall is about 46 inches per year. Winters are mild, and only occasionally are the soils frozen to a depth of as much as 2 or 3 inches.

Because the climate is generally warm and moist, chemical and biological reactions are rapid. Most soils are highly leached by the water from the abundant rainfall and are low in organic-matter content. Only the wet soils contain a significant amount of organic matter.

Hydrogen is the dominant cation in the soils of Robeson County. Because calcium, magnesium, and other basic elements are replaced by hydrogen, the soils are acid. Because of the translocation of bases,

of Robeson County have a more sandy surface layer and are less fertile than they formerly were.

Variations of climate within the county are small and probably are not the cause of local differences in the soils.

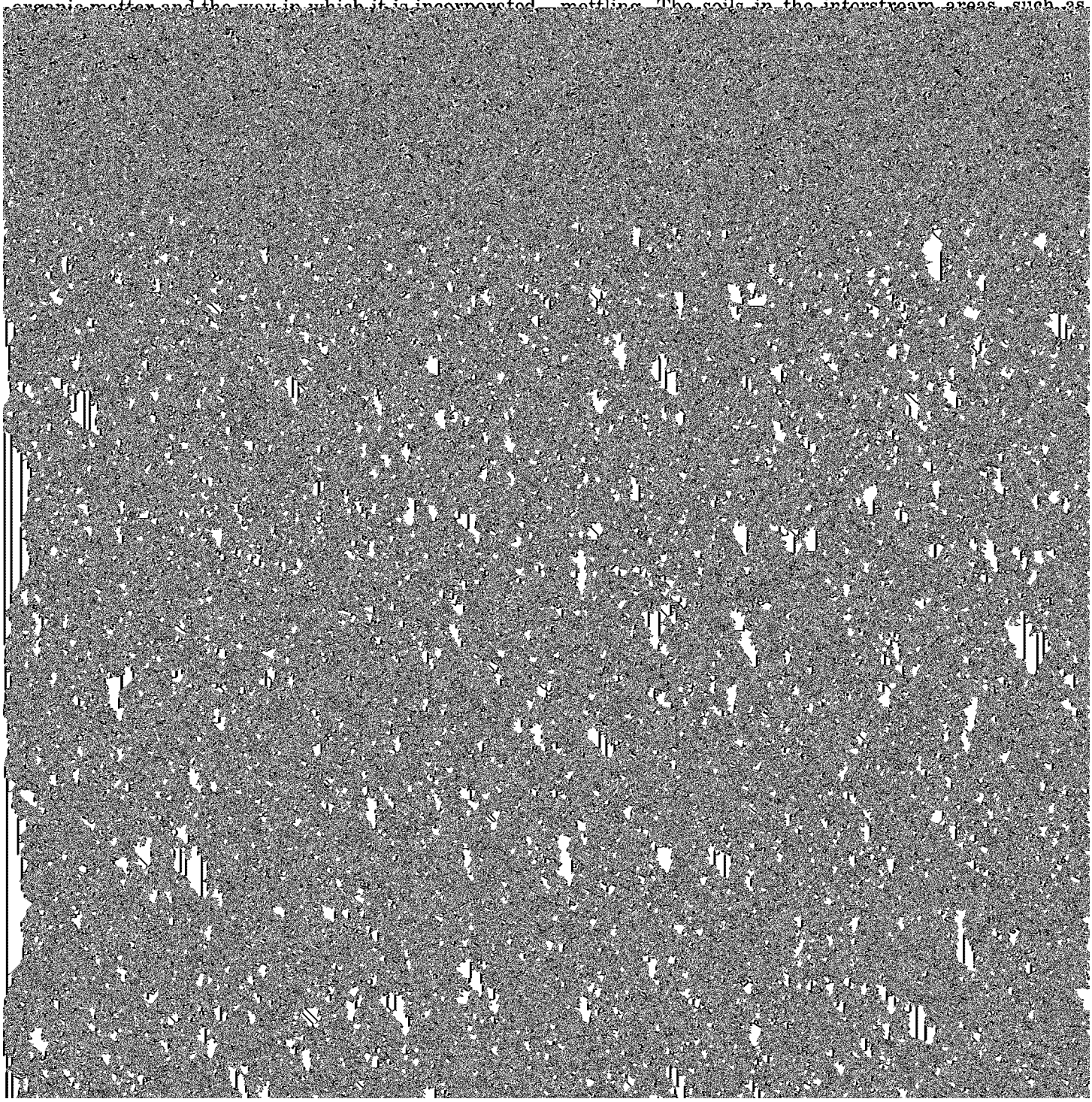
Plant and animal life

The plants and animals that live on and in the soil strongly influence its development and many of its profile characteristics. They determine the kinds of organic matter and the way in which it is incorporated

erosion and soil creep. The more sloping soils are shallower and generally are less well developed than those on the smoother, well-drained plains.

The deepest water tables are near the short, sharply rounded side slopes. Deep water tables are associated with thick A2 horizons and fine-textured B horizons that have bright colors. The well-drained Wagram and Norfolk soils have these characteristics.

High water tables are associated with thin A2 horizons and gray colors in the subsoil or low-contrast mottling. The soils in the interstream areas, such as



The soil taxonomy has six categories. Beginning with broadest, these categories are order, suborder, great group, subgroup, family, and series. In this system the criteria used as a basis for classification are soil properties that are observable and measurable. The properties are chosen, however, so that the soils of similar genesis, or mode of origin, are grouped. In table 14, the soil series of Robeson County are classified according to soil taxonomy. Classes of soil taxonomy are briefly defined in the following paragraphs.

Order.—Ten soil orders are recognized. The properties used to differentiate among soil orders are those that tend to give broad climatic groupings of soils. The three exceptions to this are the Entisols, Inceptisols, and Histosols, which occur in many different climates. Each order is named with a word of three or four syllables ending in *sol.*

Suborder.—Each order is divided into suborders that are based primarily on those soil characteristics that seem to produce classes with the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the orders. The soil properties used to separate suborders are mainly those that reflect either the presence or absence of water-logging or soil differences resulting from the climate or vegetation. The names of suborders have two syllables. The last syllable indicates the order.

Great group.—Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and features. The horizons used to make separations are those in which clay, iron, or humus have accumulated; those that have pans that interfere with the growth of roots, movement of water, or both; and thick, dark-colored surface horizons. The features used are the self-mulching properties of clay, soil temperature, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), dark-red and dark-brown colors associated with basic rocks, and the like. The names of great groups have three or four syllables and are made by adding a prefix to the name of the suborder.

Subgroup.—Great groups are divided into subgroups, one representing the central (typic) segment of the group and others, called intergrades, that have properties of the group and also one or more properties of another great group, suborder, or order. Subgroups may also be made in those instances where soil properties intergrade outside of the range of any other

TABLE 14.—*Soil series classified according to the current system of classification*

Series	Family	Subgroup	Order
Aycock[1]	Fine-silty, siliceous, thermic	Typic Paleudults	Ultisols.
Bibb	Coarse-loamy, siliceous, acid, thermic	Typic Fluvaquents	Entisols.
Byars	Clayey, kaolinitic, thermic	Umbric Paleaquults	Ultisols.
Coxville	Clayey, kaolinitic, thermic	Typic Paleaquults	Ultisols.
Dunbar	Clayey, kaolinitic, thermic	Aeric Paleaquults	Ultisols.
Duplin	Clayey, kaolinitic, thermic	Aquic Paleudults	Ultisols.
Exum	Fine-silty, siliceous, thermic	Aquic Paleudults	Ultisols.
Faceville	Clayey, kaolinitic, thermic	Typic Paleudults	Ultisols.
Goldsboro	Fine-loamy, siliceous, thermic	Aquic Paleudults	Ultisols.
Johns	Fine-loamy over sandy or sandy-skeletal, siliceous, thermic.	Aquic Hapludults	Ultisols.
Johnston	Coarse-loamy, siliceous, acid, thermic	Cumulic Humaquepts	Inceptisols.
Kalmia	Fine-loamy over sandy or sandy-skeletal, siliceous, thermic.	Typic Hapludults	Ultisols.
Lakeland	Thermic, coated	Typic Quartzipsamments	Entisols.
Leon	Sandy, siliceous, thermic	Aeric Haplaquods	Spodosols.
Lumbee	Fine-loamy over sandy or sandy-skeletal, siliceous, thermic.	Typic Ochraquults	Ultisols.
Lynchburg	Fine-loamy, siliceous, thermic	Aeric Paleaquults	Ultisols.
Marlboro	Clayey, kaolinitic, thermic	Typic Paleudults	Ultisols.
McColl	Clayey, kaolinitic, thermic	Typic Fragiaquults	Ultisols.
Meggett	Fine, mixed, thermic	Typic Albaqualfs	Alfisols.
Nahunta	Fine-silty, siliceous, thermic	Aeric Paleaquults	Ultisols.
Norfolk	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Osier	Siliceous, thermic	Typic Psammaquents	Entisols.
Pactolus	Thermic, coated	Aquic Quartzipsamments	Entisols.
Pantego	Fine-loamy, siliceous, thermic	Umbric Paleaquults	Ultisols.
Plummer	Loamy, siliceous, thermic	Grossarenic Paleaquults	Ultisols.
Pocalla	Sandy, siliceous, thermic	Arenic Paleudults	Ultisols.
Ponzer variant	Loamy, siliceous, dysic, thermic	Terric Medisaprists	Histosols.
Portsmouth	Fine-loamy, siliceous, thermic	Typic Umbraquults	Ultisols.
Rains	Fine-loamy, siliceous, thermic	Typic Paleaquults	Ultisols.
Rutlege	Sandy, siliceous, thermic	Typic Humaquepts	Inceptisols.
Toisnot	Coarse-loamy, siliceous, thermic	Typic Fragiaquults	Ultisols.
Torhunta	Coarse-loamy, siliceous, acid, thermic	Typic Humaquepts	Inceptisols.
Trebloc	Fine-silty, siliceous, thermic	Typic Paleaquults	Ultisols.
Wagram	Loamy, siliceous, thermic	Arenic Paleaudults	Ultisols.
Wakulla	Sandy, siliceous, thermic	Psammentic Hapludults	Ultisols.

[1] The Aycock soils in Robeson County are taxadjuncts to the Aycock series because they have a slightly higher content of sand that is coarser than very fine sand and in places the lower part of the B horizon contains slightly more plinthite than is defined as within the range for the series.

great group, suborder, or order. The names of subgroups are derived by placing one or more adjectives before the name of the great group.

Family.—Soil families are separated within a subgroup primarily on the basis of properties important to the growth of plants or on the behavior of soils when used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence. A family name consists of a series of adjectives preceding the subgroup name. The adjectives are the class names for texture, mineralogy, and so on, that are used to differentiate families as shown in table 14.

General Nature of the County

The first inhabitants in what is now Robeson County were Lumbee Indians who had migrated from farther east and had settled along the banks of the Lumber River. Early settlers arrived about 1730. They grew wheat, corn, rice, potatoes, and cane. In the late 1800's after the invention of the cotton gin, the major crop was cotton, but by the 1930's it was tobacco.

In 1786, Robeson County was formed from what was then a part of Bladen County, but in 1911 part of Robeson County became Hoke County. Lumberton, the county seat, was created in 1787 and incorporated in 1852. It was established on the banks of the Lumber River, along the waterfront of which the first businesses were established.

The county is mainly agricultural. Currently, the foundation of the county's farming economy is tobacco, which accounts for about 50 percent of the total farm income and which is marketed locally at Fairmont and Lumberton. Because of the abundance of good soil, the availability of water, and the local market and transportation facilities, this area is ideal for farming.

In recent years, industry has grown in Robeson County. It has helped to balance the economy and to use the surplus farm-labor force created by mechanization. Among the industries are those that produce bagging, beverages, clothing, electronic equipment, fertilizer, footwear, hosiery, knit goods, lumber, paper pulp, textile finishing, textured fibers, and tobacco as well as those that process food or store tobacco. The manufacturing plants total 58 and employ 6,946 workers. On a seasonal basis, the tobacco processors employ 2,500 additional persons.

Among the transportation facilities, which are excellent, are several major highways, 17 trucking lines, a busline, and two railroads. The major highways are Interstate Highway 95, U.S. Highway 301 and 74, and State Highways 211, 72, and 41. Also, just outside Lumberton is the Lumberton Municipal Airport, a class 4 airport.

A variety of recreation activities is available in the county. There are five golf courses. Horseback riding,

and is within the Atlantic Coastal Plain physiographic region.

Most of Robeson County is on the Sunderland geomorphic surface where the elevation is 100 to 170 feet. The extreme northern part of the county is on the Coharie geomorphic surface, where elevation is between 170 and 200 feet.

The soils formed in unconsolidated sand, silt, and clay deposited by water. Most of the sediment is in nearly level or gently sloping beds that overlie black to gray, interbedded sand, clay, and marl of the Black Creek formation.

The broad plains are dissected by permanent and intermittent streams that drain the county. All of the county, except the westernmost tip, drains directly into tributaries of the Lumber River, which meanders from north to south through the approximate center of the county. The broad interstream divides are pocketed with thousands of shallow, oval depressions, called Carolina bays. These bays are oriented in a northwest-southeast direction and range in size from less than 1 acre to more than 1,700 acres. The bays have no natural drainage outlets, and the soils in them are poorly drained or very poorly drained.

Water Supply

The Lumber River and its tributaries provide an abundant supply of surface water for all purposes. Major tributaries in the county include Big Swamp, which forms the eastern boundary of the county, Big Marsh Swamp, Raft Swamp, Richland Swamp, Back Swamp, Hog Swamp, and Ashpole Swamp. Shoe Heel Creek drains the western tip of the county.

Ground water is abundant and is near the surface in most of the county. It is easily tapped by wells for household use, for livestock, and for irrigation. Excavated ponds also are a common source of water for livestock and irrigation.

The water table fluctuates seasonally, depending on the amount of precipitation and degree of evapotranspiration. The water level peaks late in winter and early in spring and is at the lowest point late in summer and early in fall.

The chemical quality of water in the aquifers is not uniform throughout the county. Shallow aquifers commonly contain water that has an objectionable amount of iron but are generally acceptable otherwise. Water from deeper aquifers is generally of better quality.

Climate [7]

The climate of Robeson County is influenced by latitude, elevation, distance from the ocean, location on the continent, and other factors. Observational data from the Lumberton area represent the climate of most of the county. Temperature and precipitation data from rec-

16 gives information on the probability of freezing temperatures in spring and fall. In the nearly 70 years that records have been kept, the temperature at Lumberton has never been as low as 0° F. The highest temperature on record is 108°. The temperature reaches 100° in only about half the summers, but it rises to 90° or higher on more than half the days in each summer.

A large part of the rainfall during the growing season comes from summer thunderstorms and therefore varies widely from year to year, season to season, month to month, and even from place to place in the county. There can be periods of 5 to 20 days when local areas have no significant rain while other areas nearby have substantial showers. In such cases, irrigation may be worthwhile.

Frequently in autumn and occasionally in summer, tropical storms pass through the coastal waters or inland and increase rainfall. In dry seasons such rains may be beneficial.

Rainfall in winter generally results from low-pressure storms passing through or near the area and is less variable than in summer. Although several days may pass without significant rain, this is less important in winter because of the lower evaporation and transpiration.

A little snow or sleet occurs almost every winter, but the accumulation is ordinarily small and melts in a few hours. The blanketing effect of a layer of snow lasting several days is extremely rare. About once in 10 years, on the average, as much as 8 inches may accumulate; perhaps one in three of such rare accumulations may remain on the ground a week or more.

Cloudiness is variable; the sun shines, on the aver-

TABLE 15.—*Temperature and precipitation data*

[All data from Lumberton]

Month	Temperature				Precipitation					Estimated average temperature of bare, level soil at a depth of 4 inches
	Average daily maximum	Average daily minimum	2 years in 10 will have at least 4 days with— Maximum temperature equal to or higher than—	2 years in 10 will have at least 4 days with— Minimum temperature equal to or lower than—	Average total	1 year in 10 will have— Less than—	1 year in 10 will have— More than—	Number of days with snow cover of 1 inch or more	Average depth of snow on days with snow cover	
	° F	*° F*	*° F*	*° F*	*Inches*	*Inches*	*Inches*		*Inches*	*° F*
January	56	35	74	16	2.8	1.2	5.0	1	1	46
February	59	36	76	19	3.5	.8	5.5	(1)	1	47
March	66	42	86	24	3.9	2.0	5.9	(1)	1	54
April	76	50	89	35	3.9	1.3	7.2	0	----------	63
May	83	58	94	43	3.3	1.3	5.5	0	----------	73
June	89	66	97	55	4.6	2.0	8.4	0	----------	82
July	90	69	98	61	6.2	2.8	10.3	0	----------	81
August	89	68	97	59	5.1	1.8	9.9	0	----------	80
September	85	62	95	48	4.0	1.4	8.2	0	----------	76
October	76	50	89	34	2.6	.4	6.4	0	----------	66
November	65	41	80	25	2.7	.7	7.3	0	----------	55
December	56	34	74	16	3.0	1.0	5.1	(1)	1	47
Year	74	51	[2] 100	[3] 14	45.6	36.2	57.1	2	1	64

[1] Less than one-half day.
[2] Average annual highest temperature.
[3] Average annual lowest temperature.

TABLE 16.—*Probabilities of last freezing temperatures in spring and first in fall*

[All data from Lumberton]

Probability	Dates for given probability and temperature				
	16° F or lower	20° F or lower	24° F or lower	28° F or lower	32° F or lower
Spring:					
1 year in 10 later than	February 17	March 1	March 16	April 4	April 16
2 years in 10 later than	January 28	February 25	March 7	March 27	April 9
5 years in 10 later than	January 20	February 10	February 24	March 14	March 28
Fall:					
1 year in 10 earlier than	December 9	November 24	November 9	October 29	October 17
2 years in 10 earlier than	December 20	December 3	November 16	November 5	October 24
5 years in 10 earlier than	December 30	December 12	November 25	November 14	November 2

age, more than half the daylight hours in winter and about two-thirds in other seasons. The average relative humidity is about 85 percent at sunrise and drops to near 50 percent at midafternoon.

Tropical storms with destructive winds move in from the coast and reach Robeson County less than once in 10 years on the average. Tornadoes are equally rare. High winds more often result from summer thunderstorms; such winds are very local and of brief duration. Surface winds are variable in all seasons.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure

is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living

very slow, slow, moderately slow, moderate, moderately rapid, rapid, and *very rapid.*

pH value. A numerical means for designating acidity and alkalinity in soils. A pH value of 7.0 indicates precise neutrality; a higher value, alkalinity; and a lower value, acidity.

Piping. The soil is susceptible to the formation of tunnels or pipelike cavities by moving water.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents that commonly shows as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to hardpan or to irregular aggregates upon repeated wetting and drying. It is a form of laterite.

Poor outlets. Surface or subsurface drainage outlets are difficult

massive (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. Technically, the part of the soil below the solum.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it may soak

further divided by specifying "coarse," "fine," or "very fine."

Thin layer. Suitable soil material not thick enough for use as borrow material or topsoil.

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary po-

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs. Capability grouping is explained in the section that begins on page 32. Woodland suitability grouping is explained in the section that begins on page 36.

Map symbol	Mapping unit	Page	Capability unit	Woodland suitability group
			Symbol	Symbol
AyA	Aycock very fine sandy loam, 0 to 2 percent slopes--	6	IIe-1	2o1
AyB	Aycock very fine sandy loam, 2 to 6 percent slopes--	6	IIIe-1	2o1
BB	Bibb soils----------	7	Vw-1 (frequently flooded) IIIw-1 (occasionally flooded)	2w9

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