SOIL SURVEY

Scotland County North Carolina

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION

Issued October 1967

Major fieldwork for this soil survey was done in the period 1961–1963. Soil names and descriptions were approved in 1965. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1963. This survey of Scotland County was made by the Soil Conservation Service in cooperation with the North Carolina Agricultural Experiment Station and the Scotland County Board of Commissioners. The contribution of the Soil Conservation Service was made as part of the technical assistance furnished to the Scotland Soil and Water Conservation District.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY of Scotland County, N.C., contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, or other structures; and in appraising the value of tracts of land for agriculture, industry, or recreation.

Locating Soils

All the soils of Scotland County are shown on the detailed map at the back of this survey. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with numbers shown on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbol. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information in the survey. This guide lists all of the soils of the county in alphabetic order by map symbol. It shows the page where each kind of soil is described, and also the page for the capability unit and wildlife group in which the soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Interpretations not included in the text can be developed by grouping soils according to suitability or degree of limitation for a particular use. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. 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 interpretative groupings.

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

Game managers, sportsmen, and others concerned with wildlife will find information about soils and wildlife in the section "Use of the Soils for Wildlife."

Engineers and builders will find under "Engineering Uses of the Soils" tables that give descriptions of the engineering properties of the soils in the county and that name soil features that affect engineering practices and structures.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation, Classification, and Characteristics of the Soils."

Students, teachers, and others will find information about soils and their management in various parts of the text.

Newcomers in Scotland County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section "General Nature of the County," which gives additional information about the county.

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NOTICE TO LIBRARIANS

Series year and series number are no longer shown on soil surveys. See explanation on the next page.

Issued October 1967

EXPLANATION

Series Year and Series Number

Series year and number were dropped from all soil surveys sent to the printer after December 31, 1965. Many surveys, however, were then at such advanced stage of printing that it was not feasible to remove series year and number. Consequently, the last issues bearing series year and number will be as follows:

Series 1957, No. 23, Las Vegas and Eldorado Valleys Area, Nev.
Series 1958, No. 34, Grand Traverse County, Mich.
Series 1959, No. 42, Judith Basin Area, Mont.
Series 1960, No. 31, Elbert County, Colo. (Eastern Part)
Series 1961, No. 42, Camden County, N.J.
Series 1962, No. 13, Chicot County, Ark.
Series 1963, No. 1, Tippah County, Miss.

Series numbers will be consecutive in each series year, up to and including the numbers shown in the foregoing list. The soil survey for Tippah County, Miss., will be the last to have a series year and series number.

SOIL SURVEY OF SCOTLAND COUNTY, NORTH CAROLINA

REPORT BY ROBERT E. HORTON, SOIL CONSERVATION SERVICE

SOILS SURVEYED BY ROBERT E. HORTON, JOHN W. TURPIN, JULIAN H. McINTYRE, RONALD B. STEPHENS, ROY A. GOODWIN, JR., AND DEAN W. DaMOUDE, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION

SCOTLAND COUNTY is in the southern part of North Carolina (fig. 1). The town of Laurinburg, in the south-central part, is the county seat. The county has an area of 202,880 acres. The 1960 census showed a population of 25,183 for the county and 8,242 for Laurinburg.

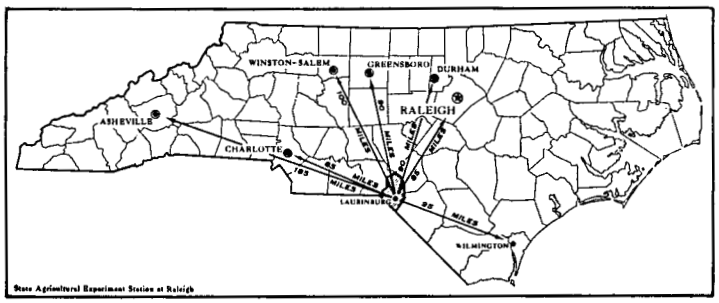

Figure 1.—**Location of Scotland County in North Carolina.**

Scotland County is part of the Coastal Plain physiographic province. Its elevation ranges from 140 to 450 feet. The northern third of the county is part of the Carolina-Georgia Sandhills and is rolling and hilly. Its lowest elevation is about 270 feet. The rest of the county is part of the Upper Coastal Plain. It is fairly smooth but has moderately steep breaks along drainageways and is pocketed with many of the oval-shaped depressions that are called Carolina bays.

The county is mainly agricultural. Its comparatively short, mild winters and long, hot summers permit a wide range in kinds of farming and choice of crops. Cotton is the principal cash crop. Other important crops are corn, tobacco, soybeans, and small grain. The raising of beef cattle and poultry are also important farm enterprises. The county has some of the largest herds of beef cattle and flocks of turkeys in the State, and the numbers of livestock and poultry are increasing.

Land use is divided approximately as follows: cropland, 58,000 acres; pasture, 6,700 acres; woodland and other uses, 138,180 acres.[1] The State maintains a Game Management Refuge covering 32,500 acres in the northern part of the Sandhills.

The soils of Scotland County are acid and strongly leached. Except for a few wet soils where water has retarded oxidation, their organic-matter content is low. The soils under native forest are low in calcium, magnesium, and potassium because they have a low capacity to store these bases. Thirty-seven percent of the acreage is droughty sand, 10 percent somewhat droughty loamy sand, 10 percent wet alluvial land and swamp, 10 percent wet soils in Carolina bays, 13 percent wet upland soils, 11 percent well-drained, sloping upland soils, and 9 percent well-drained, nearly level upland soils.

[1] NORTH CAROLINA ANNUAL FARM CENSUS, 1964. N.C. Department of Agriculture, Raleigh, N.C.

How This Soil Survey Was Made

Soil scientists made this survey to learn what kinds of soils are in Scotland County, where they are located, and how they can be used. They went into the county knowing they likely would find many soils they had already seen and perhaps some they had not. As they traveled over the county, they observed steepness, length, and shape of slopes; kinds of native plants or crops; 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 roots of plants.

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. To use this report efficiently, it is necessary to know the kinds of groupings most used in a local soil classification.

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. Norfolk and Wagram, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the natural landscape. Soils of one series can differ somewhat in texture of the surface soil and in slope or in some other characteristic that affects use of the soils by man.

Many soil series contain soils that differ in texture of their surface layer. According to such differences in texture, separations called soil types are made. Within a series, all the soils having a surface layer of the same texture belong to one soil type. Plummer loamy sand and Plummer sand are two soil types in the Plummer series.

The difference in texture of their surface layers is apparent from their names.

Some soil types vary so much in slope, degree of erosion, or some other feature affecting their use, that practical suggestions about their management could not be made if they were shown on the soil map as one unit. Such soil types are divided into phases. The name of a soil phase indicates a feature that affects management. For example, Norfolk loamy sand, 0 to 2 percent slopes, is one of several phases of Norfolk loamy sand, a soil type that ranges from nearly level to sloping.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that greatly help in drawing boundaries accurately. The soil map in the back of this report was prepared from aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning management of farms and fields, a mapping unit is nearly equivalent to a soil type or a phase of a soil type. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil type or soil phase.

Some areas are shown that are so frequently flooded and mixed by water that they are not classed as soils. These areas are shown on a soil map like other mapping units, but they are given descriptive names, such as Alluvial land, wet, and are called land types rather than soils.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soils in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soils. Yields to be expected under a high level of management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in such a way that it is readily useful to different groups of readers, among them farmers, ranchers, managers of woodland, engineers, and homeowners. Grouping soils that are similar in suitability for each specified use is the method of organization commonly used in soil surveys. On the basis of yield and practice tables and other data, the soil scientists set up trial groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others, and then adjust them according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

The general soil map at the back of this report shows, in color, the soil associations in Scotland County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of farming or other land use. Such a map is not suitable for planning the management of a farm or field, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect management.

In this county there are five associations. These are discussed in the following pages.

1. Lakeland-Gilead association

Nearly level to moderately steep sandy soils of the Sandhills

This association (fig. 2) consists of broad ridges that have gently sloping to sharply breaking side slopes, generally adjoining drainageways. Elevations range from 270 to 450 feet. In places the hills rise abruptly above the plain. All of the larger creeks that drain the county rise in this association, as do many smaller drainageways. This association makes up about 45 percent of the county. It covers most of the northern part and extends into the west-central and south-central parts.

Lakeland soils make up about 50 percent of this association. They are mainly on broad ridgetops, but in places they extend down the side slopes. They are deep, somewhat excessively drained sands that formed in thick sediments. They have a grayish sandy surface layer overlying pale-yellow to strong-brown sandy material. They are sandy to a depth of several feet.

Gilead soils make up about 13 percent of the association. They are mainly on gentle toe slopes and side slopes but occur also on low ridges downslope from Lakeland soils. They have a sandy surface layer and a light yellowish-brown or pale-brown, firm, slightly cemented subsoil of sandy clay loam or sandy clay.

The rest of this association is made up of minor acreages of other soils. Vaucluse soils, mainly on steep side slopes, make up about 2 percent of the association. They have a sandy surface layer and a reddish, firm, slightly cemented subsoil of sandy loam to sandy clay. Hoffman and Wagram soils occur on some of the moderately steep side slopes and on a few of the gentle slopes. Plummer, Rutlege, and Bibb soils occur at the head of drainageways and in depressions. Alluvial land occupies areas along most of the drainageways.

About 70 percent of this association is wooded. Approximately 32,500 acres is owned by the State and administered by the State Wildlife Resources Commission. About 6,000 acres is used as a military base. Most of the cleared areas are on broad ridges between streams, on gentle side slopes, and on toe slopes. The farms are small to medium in size. Most are operated by their owners, and most are row-crop farms.

The soils in this association are low or very low in fertility and are generally droughty. The moderately steep side slopes and the areas occupied by Gilead soils are easily eroded. Large cultivated areas of the Lakeland

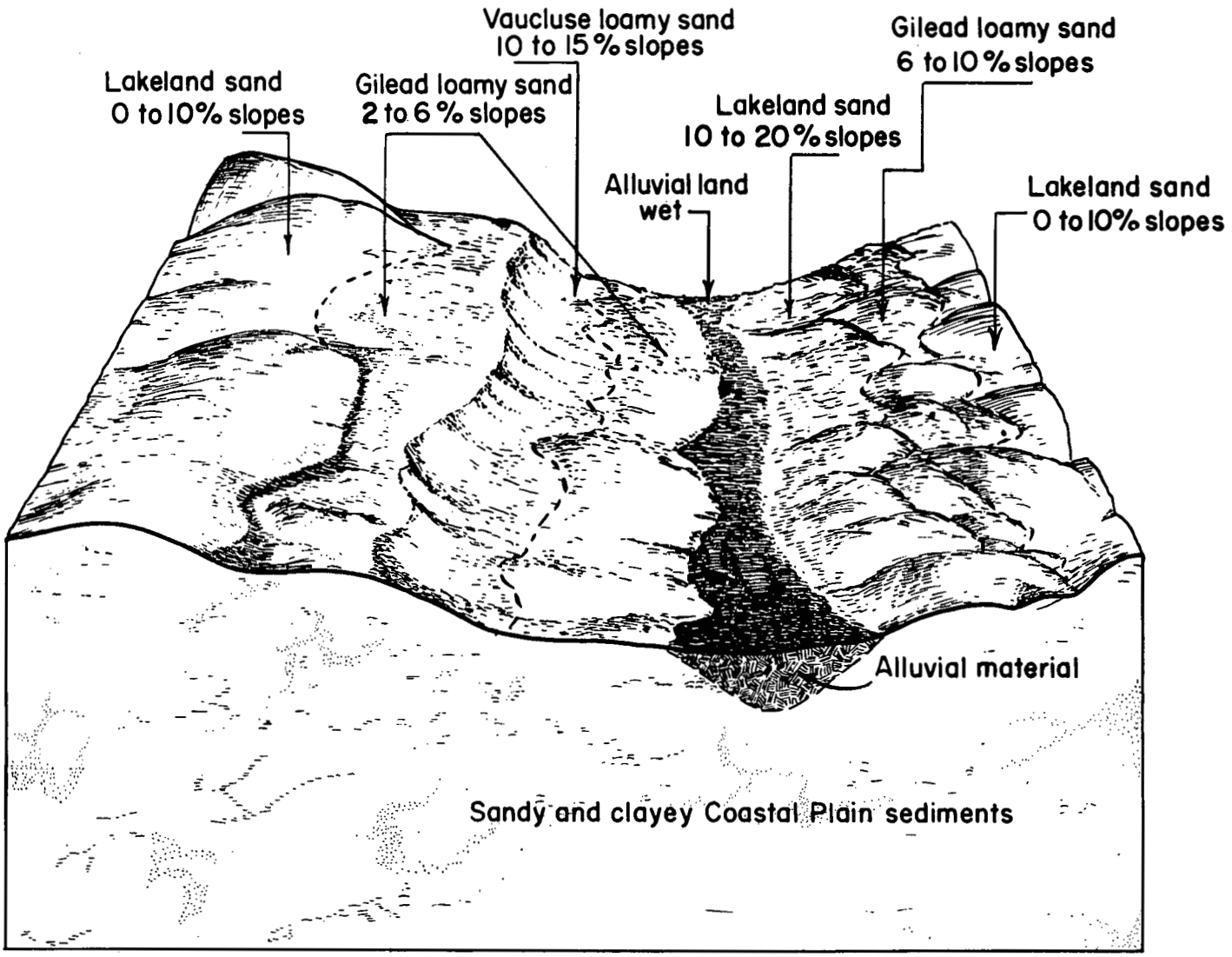

Figure 2.—**Soils of association 1 and their general position on the landscape.**

soils are subject to wind erosion if unprotected. Crop yields are generally low. On some of the broad ridges, the native vegetation is too sparse and the water supply is too low to provide a suitable habitat for wildlife. This association is well suited to recreational use, particularly to camping, hiking, and hunting. The several lakes provide fishing and swimming.

2. *Eustis-Wagram-Kenansville association*

Nearly level to sloping, well-drained or somewhat excessively drained sands and loamy sands on broad ridges

This association (fig. 3) consists of broad, nearly level to sloping ridges that break abruptly along drainageways. The ridges are long and smooth. The large streams have wide, swampy flood plains. This association makes up about 10 percent of the county. It is in the eastern part.

Eustis soils make up about 30 percent of the association. They have a gray or dark-gray surface layer and a strong-brown to yellowish-red subsoil of loamy sand.

Wagram soils make up about 30 percent of the association. They have a gray or dark-gray surface layer 20 to 40 inches thick. Their subsoil is brownish-yellow to yellowish-red sandy loam to sandy clay loam.

Kenansville soils make up about 20 percent of the association. They have a gray or dark-gray surface layer overlying a thin, brownish-yellow to strong-brown subsoil of sandy loam.

The rest of this association is made up of minor acreages of Lakeland, Norfolk, and Plummer soils and of Alluvial land, wet.

About 55 percent of this association is used for crops and pasture. The farms are medium to large in size. Most are row-crop farms. Many are rented or leased or worked on a share basis. Row crops are generally grown.

The soils in this association are very low or low in fertility and are generally droughty. If unprotected, they are subject to severe wind erosion. This association is well suited to industrial and recreational uses.

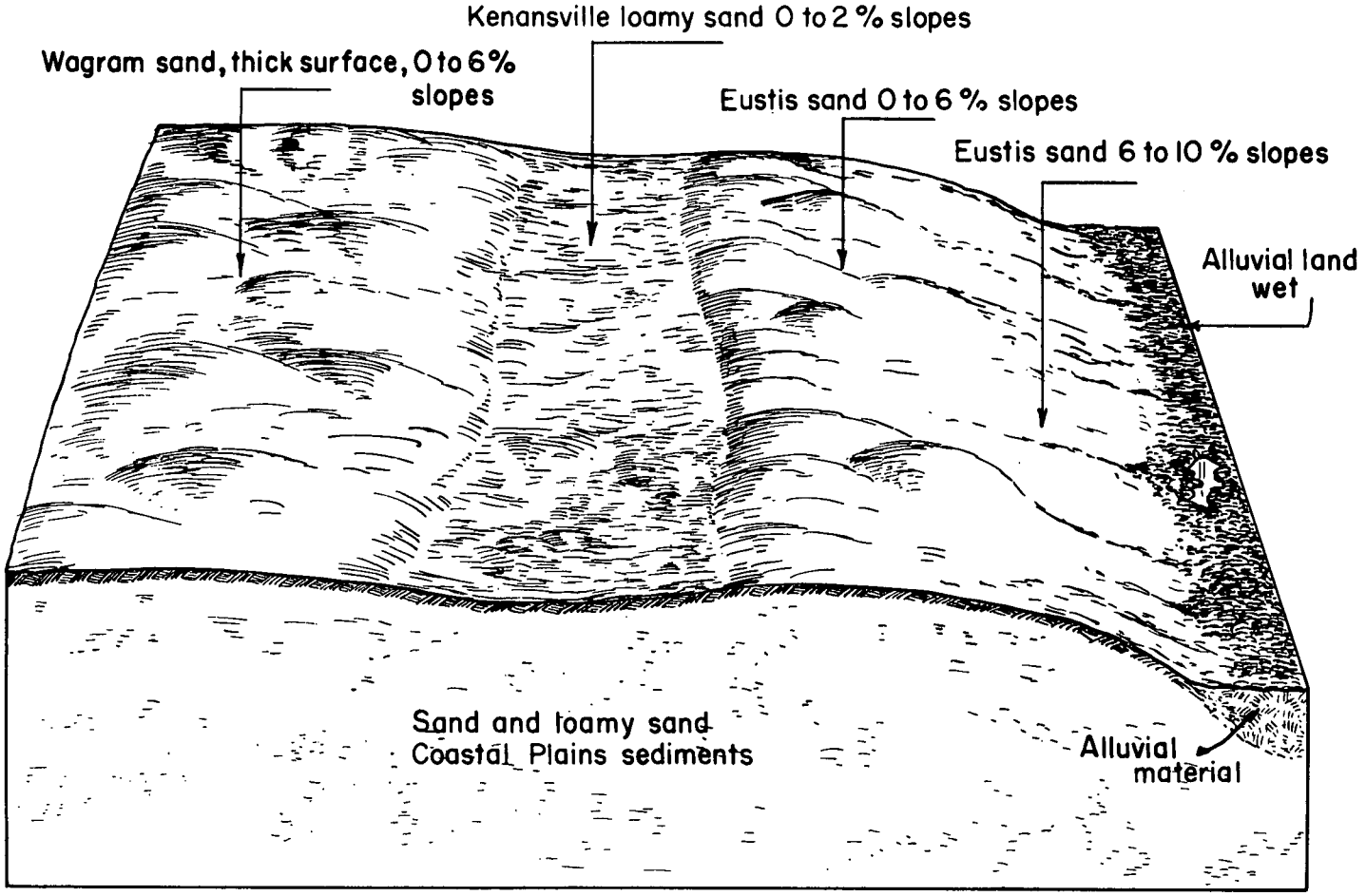

Figure 3.—**Soils of association 2 and their general position on the landscape.**

3. Marlboro-Norfolk-McColl association

Nearly level to sloping, well-drained soils on broad upland ridges, and wet soils in oval-shaped Carolina bays

This association (fig. 4) consists of broad, nearly level to sloping soils, pocketed with many oval depressions called Carolina bays. The bays range in size from a few acres to several hundred acres and are oriented in a northwest-southeast direction. They do not have natural drainage outlets. The association is dissected by a few permanent streams and many intermittent streams. The drainageways have short, sloping sides and wide bottoms. This association makes up about 40 percent of the county. It covers most of the central, south-central, and west-central parts of the county.

Marlboro and Norfolk soils are on the broad upland ridges. They are well drained and have a gray to dark grayish-brown surface layer of loamy sand. Marlboro soils make up about 14 percent of this association. They have a brownish-yellow to strong-brown subsoil of sandy clay that is friable or firm when moist and sticky when wet. Norfolk soils make up about 11 percent of the association. They have a brownish-yellow to strong-brown, friable subsoil of sandy loam to sandy clay loam.

McColl soils are wet and occur in the bays. They have a surface layer of gray to very dark gray loam and a subsoil of firm or friable sandy clay to clay. They have many strong-brown mottles in the subsoil. McColl soils make up about 8 percent of this association.

The rest of this association is made up of minor acreages of Orangeburg, Lakeland, Coxville, Duplin, Faceville, Dunbar, and Wagram soils.

Much of this association consists of productive soils. About 80 percent of it is cleared and used for crops and pasture. The farms are generally 100 to 300 acres in size. Most are used for cash crops, and some have large herds of beef cattle. About half are operated by their owners, and the rest by farm managers or tenants. The principal crops are cotton, tobacco, corn, soybeans, and truck crops.

Except for the depressions and the steep side slopes, this association is well suited to intensive farming with machinery. If the depressions are drained, they can be used for crops. The steeper slopes are likely to erode when cultivated unless conservation methods are used. Trees and other plants that provide food and cover for wildlife grow well in this association, and the undrained depressions provide good wildlife habitats.

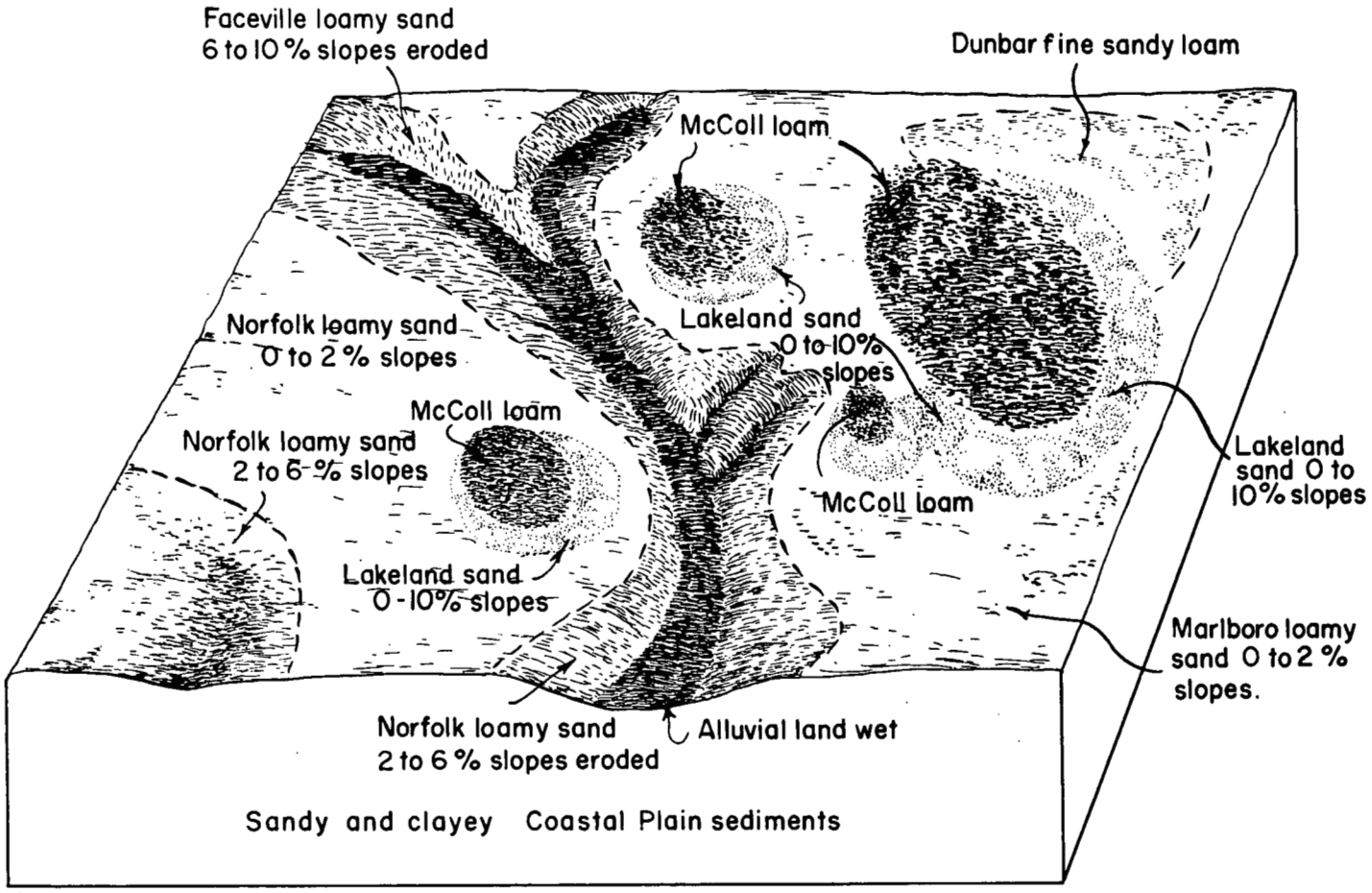

Figure 4.—**Soils of association 3 and their general position on the landscape.**

4. Coxville-Dunbar-Duplin association

Nearly level, moderately well drained to poorly drained soils on broad flats made up of interbay areas and oval-shaped depressions

This association is broad and flat. It has many Carolina bays. These oval-shaped depressions run together in most places, and drainage outlets are poorly defined. There are no permanent streams and only a few intermittent streams. Just a few feet of elevation separates the bays and the interbay areas. This association makes up about 2 percent of the county. It is along the southeastern border.

Coxville soils make up about 25 percent of this association. They occur in the bays. They have a dark gray or very dark gray loamy surface layer and a gray or light-gray firm subsoil of sandy clay to clay.

Dunbar and Duplin soils make up about 45 percent of the association. They are between the bays and are at slightly higher elevations than Coxville soils. They have a surface layer of fine sandy loam or sandy loam and a subsoil of friable to firm sticky sandy clay. Dunbar soils are somewhat poorly drained, and Duplin soils are moderately well drained.

The rest of this association is made mostly of Rains and Lynchburg soils and small areas of McColl and Plummer soils.

About 60 percent of this association is wooded. Most of the cleared land is in interbay areas. Farms are generally between 100 and 300 acres in size and are used for cash crops. About half are operated by their owners, and the rest by farm managers or tenants. The principal crops are corn, soybeans, cotton, tobacco, and truck crops.

The areas between the bays are well suited to intensive farming, but drainage is needed in many places. If the bays are drained, they can be used for crops. If undrained, they provide good wildlife habitats. Trees and other plants that provide food and cover for wildlife grow well in this association.

5. Lumbee-Johns-Okenee association

Nearly level, somewhat poorly drained to very poorly drained soils on stream terraces

This association consists of areas of old alluvial sediments between the flood plains of fairly large streams and the upland plain. It is nearly level, and only a few feet of elevation separates the somewhat poorly drained soils

from the very poorly drained soils. Drainage outlets are poorly defined, and the wettest areas are generally next to the upland soils. This association makes up about 3 percent of the county.

Lumbee and Okenee soils make up 50 percent of this association. They are in the lower, poorly drained or very poorly drained areas. They have a dark-gray or black surface layer and a light-gray to dark-gray subsoil of friable or firm sandy loam to sandy clay loam.

Johns soils make up about 25 percent of the association. They have a gray to very dark gray surface layer of loamy sand and a light yellowish-brown to light olive-brown subsoil of friable or firm sandy loam to sandy clay loam. They are somewhat poorly drained.

The rest of this association is made up of Kalmia, Maxton, and Lakeland soils. These soils are in the higher, better drained areas.

About 65 percent of this association is wooded. Most of the cleared acreage consists of the higher, somewhat poorly drained soils. Farms are used for cash crops. Most are operated by their owners or by tenants. The principal crops are cotton, corn, soybeans, and tobacco.

Except for the low, wet areas, this association is suited to intensive farming. If the wet areas are drained, they can be used for crops. If undrained, they provide good habitats for wildlife.

Descriptions of the Soils

This section describes the soil series and mapping units of Scotland County. The approximate acreage and the proportionate extent of each mapping unit are given in table 1.

A general description of each soil series is given, and it is followed by brief descriptions of the mapping units in that series. For full information on any one mapping unit, it is necessary to read the description of the soil series as well as the description of the mapping unit.

Following 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 the description of each mapping unit are the capability unit, the woodland group, and the wildlife group in which the mapping unit has been placed. The page on which each capability unit, woodland group, and wildlife group is described can be found readily by referring to the "Guide to Mapping Units," which is at the back of the report.

Soil scientists, engineers, students, and others who want detailed descriptions of soil series should turn to the section "Formation, Classification, and Characteristics of the Soils." Many terms used in the soil descriptions and other sections of the report are defined in the Glossary.

Alluvial Land, Wet

Alluvial land, wet (Al) consists of soils that are variable in texture and are poorly drained or very poorly drained. The surface layer is grayish or black sand, loamy sand, or silt. Characteristically, it is high in organic-matter content. The texture of the underlying sediments ranges from coarse loamy to fine loamy but is predominantly coarse loamy. In many places strata of coarse sand and gravel are within 40 inches of the surface. Generally, stream channels are not well defined, and most of the areas are flooded frequently each year.

This land type is extensive. Most of the acreage is wooded. Suitability for crops and pasture varies, and only general interpretations can be made. (Capability unit Vw–1; woodland group 7; wildlife group 4)

Bibb Series

The Bibb series consists of poorly drained soils in drainageways and on foot slopes. These soils formed in moderately coarse textured to moderately fine textured local alluvium. The main layers of a typical profile are—

0 to 9 inches, dark-gray, very friable loam.
9 to 24 inches, grayish-brown, very friable sandy loam.
24 to 28 inches, very dark gray, very friable sandy loam.
28 to 32 inches, gray, very friable sandy loam.
32 to 50 inches +, light-gray, friable sandy clay loam.

These soils are low in natural fertility, medium in available water capacity, and very strongly acid unless limed. Their organic-matter content is medium. Water penetrates readily and moves through the soils at a moderate rate.

Bibb soils occur throughout the county, as small, mostly narrow areas at the heads of drainageways. Most of the acreage is wooded.

Bibb soils, local alluvium (Ba).—The surface layer of these soils consists of 16 inches or more of dark-gray to black alluvial material. The subsoil is gray or dark-gray sandy loam to sandy clay. Seepage spots are common. Surface runoff is slow to ponded. Included in mapping were small areas that have a surface layer of sandy loam and a few areas that are very poorly drained.

If these soils are drained, they are fairly well suited to a few of the crops grown in the county. Crops respond moderately well to fertilizer and lime. Use of the soils for crops and pasture is limited by wetness and surface ponding. (Capability unit IVw–1; woodland group 5; wildlife group 4)

Blaney Series

In the Blaney series are well-drained, nearly level to sloping soils that formed in coarse-textured to moderately fine textured sediments. These soils consist of as much as 30 inches of sand over a slightly cemented subsoil. The main layers of a typical profile are—

0 to 7 inches, grayish-brown, loose sand.
7 to 24 inches, pale-brown, loose sand.
24 to 32 inches, light yellowish-brown, firm, slightly cemented sandy clay loam.
32 to 40 inches, yellow, firm, slightly cemented sandy clay loam.
40 to 48 inches, yellow and light reddish-brown, compact, coarse sandy clay loam mottled with light gray.

These soils are very low in natural fertility, low in available water capacity, and very strongly acid unless limed. Their organic-matter content is low. Water penetrates readily but moves through the soils at a moderately slow rate.

Blaney soils occur in the Sandhills. They are fairly well suited to most of the crops grown in the county and produce fair yields under good management. About half of the acreage is used for crops and pasture.

Blaney sand, 0 to 6 percent slopes (BnB).—The surface layer of this soil consists of 6 to 10 inches of gray sand over

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

Soil	Acres	Percent	Soil	Acres	Percent
Alluvial land, wet	10, 936	5. 4	Maxton loamy sand, 0 to 2 percent slopes	216	. 1
Bibb soils, local alluvium	2, 359	1. 2	Norfolk loamy sand, 0 to 2 percent slopes	6, 884	3. 4
Blaney sand, 0 to 6 percent slopes	2, 355	1. 2	Norfolk loamy sand, 2 to 6 percent slopes	1, 738	. 9
Blaney sand, 6 to 10 percent slopes	1, 030	. 5	Norfolk loamy sand, 2 to 6 percent slopes, eroded	812	. 4
Chipley loamy sand	1, 138	. 6	Norfolk loamy sand, 6 to 10 percent slopes, eroded	260	. 1
Coxville loam	6, 176	3. 0	Ocilla loamy sand	1, 805	. 9
Craven sandy loam, 2 to 6 percent slopes, eroded	118	(1)	Okenee loam	1, 177	. 6
Craven sandy loam, 6 to 10 percent slopes, eroded	55	(1)	Orangeburg loamy sand, 0 to 2 percent slopes	303	. 1
Dunbar fine sandy loam	4, 192	2. 0	Orangeburg loamy sand, 2 to 6 percent slopes	382	. 2
Duplin sandy loam	2, 707	1. 3	Orangeburg loamy sand, 2 to 6 percent slopes, eroded	435	. 2
Eustis sand, 0 to 6 percent slopes	7, 631	3. 8	Orangeburg loamy sand, 6 to 10 percent slopes, eroded	210	. 1
Eustis sand, 6 to 10 percent slopes	206	. 1	Plummer loamy sand	1, 440	. 7
Faceville loamy sand, 0 to 2 percent slopes	489	. 2	Plummer sand	2, 039	1. 0
Faceville loamy sand, 2 to 6 percent slopes	536	. 3	Portsmouth loam	1, 795	. 9
Faceville loamy sand, 2 to 6 percent slopes, eroded	1, 189	. 6	Rains fine sandy loam	4, 955	2. 4
Faceville loamy sand, 6 to 10 percent slopes, eroded	365	. 2	Rutlege loamy sand	3, 763	1. 9
Gilead loamy sand, 0 to 2 percent slopes	504	. 2	St. Lucie sand	144	(1)
Gilead loamy sand, 2 to 6 percent slopes	5, 450	2. 7	Smoothed sandy land	1, 542	. 8
Gilead loamy sand, 2 to 6 percent slopes, eroded	661	. 3	Swamp	8, 322	4. 1
Gilead loamy sand, 6 to 10 percent slopes	3, 588	1. 8	Vaucluse loamy sand, 2 to 6 percent slopes	233	. 1
Gilead loamy sand, 6 to 10 percent slopes, eroded	836	. 4	Vaucluse loamy sand, 2 to 6 percent slopes, eroded	211	. 1
Gilead loamy sand, 10 to 15 percent slopes	987	. 5	Vaucluse loamy sand, 6 to 10 percent slopes	537	. 3
Goldsboro loamy sand, 0 to 2 percent slopes	1, 606	. 8	Vaucluse loamy sand, 6 to 10 percent slopes, eroded	345	. 2
Hoffman loamy sand, 6 to 10 percent slopes, eroded	94	(1)	Vaucluse loamy sand, 10 to 15 percent slopes	382	. 2
Hoffman loamy sand, 10 to 20 percent slopes	167	. 1	Vaucluse loamy sand, 10 to 15 percent slopes, eroded	186	(1)
Johns loamy sand	1, 472	. 7	Wagram loamy sand, 0 to 2 percent slopes	6, 873	3. 4
Johnston mucky loam	1, 933	1. 0	Wagram loamy sand, 2 to 6 percent slopes	1, 779	. 9
Kalmia loamy sand, 0 to 2 percent slopes	284	. 1	Wagram loamy sand, 6 to 10 percent slopes	852	. 4
Kenansville loamy sand, 0 to 2 percent slopes	3, 028	1. 5	Wagram sand, thick surface, 0 to 6 percent slopes	14, 500	7. 1
Kenansville loamy sand, 2 to 6 percent slopes	867	. 4	Wagram sand, thick surface, 6 to 10 percent slopes	5, 241	2. 6
Lakeland sand, 0 to 10 percent slopes	44, 971	22. 2	Wagram sand, thick surface, 10 to 15 percent slopes	976	. 5
Lakeland sand, 10 to 20 percent slopes	1, 519	. 7	Borrow pits	233	. 1
Lumbee loamy sand	1, 753	. 9			
Lynchburg loamy sand	2, 259	1. 1	Total	202, 880	100. 0
Mantachie soils, local alluvium	632	. 3			
Marlboro loamy sand, 0 to 2 percent slopes	9, 934	4. 9			
Marlboro loamy sand, 2 to 6 percent slopes	607	. 3			
Marlboro loamy sand, 2 to 6 percent slopes, eroded	964	. 5			
McColl loam	6, 712	3. 3			

[1] Less than 0.1 percent.

10 to 20 inches of pale-brown to light yellowish-brown sand or loamy sand. The subsoil is friable or firm, slightly cemented sandy clay loam to sandy clay. There are a few seepage areas. Included in mapping were small areas that have a surface layer of loamy sand.

This soil is fairly well suited to most of the crops grown in the county and produces fair yields under good management. Crops respond moderately well to fertilizer and lime. Use of this soil is limited by very low fertility, low available water capacity, moderately severe leaching of plant nutrients, and susceptibility to wind and water erosion. (Capability unit IIs–1; woodland group 8; wildlife group 5)

Blaney sand, 6 to 10 percent slopes (BnC).—The surface layer of this soil consists of 6 to 10 inches of gray sand over 10 to 20 inches of pale-brown to light yellowish-brown sand to loamy sand. The subsoil is friable or firm, slightly cemented sandy clay loam to sandy clay. There are a few seepage areas. Included in mapping were small areas that have a surface layer of loamy sand.

This soil is fairly well suited to most of the crops grown in the county and produces fair yields under good management. Crops respond moderately well to fertilizer and lime. Use of this soil is limited by very low fertility, low available water capacity, moderately severe leaching of plant nutrients, moderate runoff, and susceptibility to wind erosion. (Capability units—IIIe–3; woodland group 8; wildlife group 5)

Chipley Series

In the Chipley series are moderately well drained, nearly level soils that formed in coarse-textured sediments. These soils consist of more than 40 inches of sand. The main layers of a typical profile are—

0 to 7 inches, dark-gray, very friable loamy sand.
7 to 24 inches, very pale brown, loose sand.
24 to 48 inches +, pale-yellow and light-gray loose sand.

These soils are very low in natural fertility, low in available water capacity, and very strongly acid unless limed. Their organic-matter content is medium or low. Water penetrates readily and moves through the soils rapidly.

Chipley soils occur in small areas throughout the county. About half of the acreage is used for crops and pas-

ture. They are fairly well suited to many of the crops grown in the county, but yields are generally low.

Chipley loamy sand (Ch).—This soil occurs on stream terraces. Its surface layer is gray or dark-gray loamy sand. Below this is very pale brown to light yellowish-brown sand or loamy sand mottled with gray. Included in mapping were areas where the surface layer is sand. These areas make up 10 percent of the acreage. Also included were small areas that are somewhat poorly drained.

This soil is fairly well suited to many of the crops grown in the county, but yields are generally low. Crops respond moderately well to fertilizer and lime. Use of this soil for crops and pasture is limited mainly by leaching of plant nutrients, very low natural fertility, low available water capacity, and moderate wetness. (Capability unit IIIw–1; woodland group 9; wildlife group 2)

Coxville Series

The Coxville series consists of poorly drained soils in broad, flat areas and in Carolina bays. These soils formed in fine-textured sediments. The main layers of a typical profile are—

0 to 7 inches, very dark gray, very friable loam.
7 to 48 inches, gray, firm and slightly plastic clay and sandy clay with a few red mottles.

These soils are medium in natural fertility and available water capacity and are very strongly acid unless limed. Their organic-matter content is medium. Water penetrates at a moderately slow rate and moves slowly through these soils.

Coxville soils are extensive in the central and southern parts of the county and are important to agriculture. About 60 percent of the acreage is wooded, and 40 percent is used for crops and pasture. If they are drained, these soils are well suited to many of the crops grown in the county.

Coxville loam (Co).—The surface layer of this soil is dark gray or very dark gray loam and is 5 to 8 inches thick. The subsoil is gray or light-gray, firm and slightly plastic sandy clay to clay with few to common, distinct mottles of red, yellowish red, or brownish yellow. Surface runoff is slow to ponded. Included in mapping were small areas where the surface layer is silt loam or fine sandy loam. Also included were a few areas of somewhat poorly drained soils.

Use of this soil is limited mainly by wetness and slow permeability. The plow layer is hard to keep in good tilth, and the moisture content at which it can be worked without clodding and crusting is narrow. A complete drainage system of tile or open ditches is necessary in order to use this soil for crops, but if the soil is drained, crops respond moderately well to fertilizer and lime. (Capability unit IIIw–2; woodland group 6; wildlife group 3)

Craven Series

The Craven series consists of moderately well drained, gently sloping or sloping soils of the uplands. These soils formed in fine-textured sediments. The main layers of a typical profile are—

0 to 5 inches, grayish-brown, very friable sandy loam.
5 to 24 inches, light olive-brown, firm and sticky silty clay.
24 to 42 inches +, light olive-brown and gray, firm and sticky sandy clay to clay with common mottles of strong brown and yellowish red.

These soils are medium in natural fertility and available water capacity and are very strongly acid unless limed. Their organic-matter content is low. Water penetrates at a moderatedly slow rate and moves through these soils slowly.

Craven soils occur in the central and south-central parts of the county. They occupy only a small acreage. They are not important to agriculture, though they are fairly well suited to most of the crops grown in the county.

Craven sandy loam, 2 to 6 percent slopes, eroded (CrB2).—The surface layer of this soil is gray to dark grayish-brown sandy loam and is 4 to 8 inches thick. The subsoil is pale-brown to yellowish-brown, firm or very firm, sticky silty clay or clay. Mottles of gray, strong brown, and yellowish red occur in the lower part of the subsoil. The plow layer is generally a mixture of the original surface material and part of the subsoil. In a few areas the surface layer is fine sandy loam and the subsoil is sandy clay. Included in mapping was a small acreage that is not eroded.

This soil is fairly well suited to most of the crops grown in the county, and most of the acreage is cultivated. The plow layer clods and crusts if it is worked when too dry or too wet, and good tilth is difficult to maintain. Crops respond moderately well to fertilizer and lime. Surface runoff is medium and causes a moderate erosion hazard. (Capability unit IIe–3; woodland group 4; wildlife group 1)

Craven sandy loam, 6 to 10 percent slopes, eroded (CrC2).—The surface layer of this soil is gray to dark grayish-brown sandy loam 4 to 8 inches thick. The subsoil is pale-brown to yellowish-brown, firm or very firm, sticky silty clay or clay. Mottles of gray, strong brown, and yellowish red occur in the lower part of the subsoil. The plow layer is generally a mixture of the original surface material and part of the subsoil. Included in mapping was a small acreage that is uneroded.

This soil is fairly well suited to most of the crops grown in the county, but most of the acreage is wooded. The plow layer clods and crusts if it is worked when too dry or too wet, and good tilth is difficult to maintain. Crops respond moderately well to fertilizer and lime. Surface runoff is rapid and causes a severe erosion hazard in cultivated areas. (Capability unit IIIe–2; woodland group 4; wildlife group 1)

Dunbar Series

The Dunbar series consists of deep, somewhat poorly drained soils on broad, nearly level flats and in small depressions in the uplands. These soils formed in moderately fine textured or fine textured sediments. The main layers of a typical profile are—

0 to 8 inches, dark-gray, very friable fine sandy loam.
8 to 16 inches, light olive-brown, friable, sticky sandy clay.
16 to 38 inches, mottled strong-brown, yellowish-brown, and gray, friable, sticky sandy clay.
38 to 50 inches, gray, friable, sticky sandy clay; many coarse, distinct mottles of strong brown, yellowish brown, and pale brown.

These soils are medium in natural fertility and available water capacity and are very strongly acid unless limed. Their organic-matter content is medium. Water penetrates at a moderate rate and moves through these soils moderately slowly.

Dunbar soils are fairly extensive in the southern and central parts of the county and are important to agriculture. About 60 percent of the acreage is cleared and used for cultivated crops and pasture.

Dunbar fine sandy loam (Db).—The surface layer of this soil is gray or very dark gray, very friable fine sandy loam. The subsoil is light olive-brown, friable, sticky sandy clay, mottled with gray and strong brown below a depth of 14 inches. Surface runoff is slow to ponded in some areas. Included in mapping were small areas that have a surface layer of sandy loam or loam.

Use of this soil for crops is limited mainly by wetness. The plow layer is easy to keep in good tilth, but the range of moisture content within which it can be worked is narrow. For cultivated crops, a complete drainage system of tile or open ditches is needed, but for pasture, surface drainage alone is adequate. If the soil is drained, crops respond well to fertilizer and lime. (Capability unit IIw–2; woodland group 3; wildlife group 2)

Duplin Series

The Duplin series consists of deep, nearly level, moderately well drained soils of the uplands. These soils formed in moderately fine textured or fine textured sediments. The main layers of a typical profile are—

0 to 8 inches, dark grayish-brown, very friable sandy loam.
8 to 22 inches, light olive-brown, friable, sticky sandy clay.
22 to 32 inches, pale-brown, friable, sticky sandy clay with gray and strong-brown mottles.
32 to 48 inches, mottled gray, strong-brown, yellowish-red, and pale-brown, friable, sticky sandy clay.

These soils are medium in natural fertility and available water capacity and are strongly acid or very strongly acid unless limed. Their organic-matter content is low. Water penetrates at a moderate rate but moves through these soils moderately slowly.

Duplin soils are fairly extensive in the central and southern parts of the county and are important to agriculture. They are well suited to most of the crops grown locally. About 80 percent of the acreage is used for crops and pasture.

Duplin sandy loam (Dp).—The surface layer of this soil is gray to dark grayish-brown, very friable sandy loam and is 7 to 12 inches thick. The subsoil is yellowish-brown to light olive-brown, friable, sticky sandy clay mottled with gray and strong brown in the lower part. Surface runoff is slow. Included in mapping were small areas where the surface layer is fine sandy loam or loam.

There are no major limitations to use of this soil for crops and pasture. Crops respond well to lime and fertilizer. In places drainage is needed for optimum yields of such specialized crops as tobacco. (Capability unit IIw–1; woodland group 2; wildlife group 1)

Eustis Series

The Eustis series consists of somewhat excessively drained, deep sands of the uplands. These soils formed in coarse-textured sediments in nearly level to sloping areas. The main layers of a typical profile are—

0 to 8 inches, grayish-brown, loose sand.
8 to 20 inches, pale-brown, loose sand.
20 to 40 inches, strong-brown, very friable loamy sand.
40 to 60 inches, reddish-yellow, loose sand.

These soils are very low in natural fertility, low in available water capacity, and strongly acid or very strongly acid unless limed. Their organic-matter content is very low. Water penetrates rapidly and moves through these soils at a rapid rate.

Eustis soils are extensive throughout the county. About half the acreage is used for crops and pasture, and the rest is wooded.

Eustis sand, 0 to 6 percent slopes (EuB).—The surface layer of this soil is gray or dark-gray sand. The subsoil is yellowish-red to strong-brown loamy sand. Included in mapping were a few areas where the surface layer is loamy sand and the subsurface layer is sand. Also included was a small acreage of soils that have a darker colored surface layer.

This soil is fairly well suited to many of the crops grown in the county, and fair yields can be expected under good management. The plow layer is easy to keep in good tilth and can be worked within a wide range of moisture content. Most of the acreage is in cultivation. Crops respond moderately well to fertilizer and lime. Use of this soil is limited mainly by very low natural fertility, low available water capacity, severe leaching of nitrogen and potash in rainy periods, and the hazard of wind erosion. (Capability unit IIIs–1; woodland group 11; wildlife group 6)

Eustis sand, 6 to 10 percent slopes (EuC).—The surface layer of this soil is gray or dark-gray sand. The subsoil is yellowish-red to strong-brown loamy sand. Included in mapping were a few areas where the surface layer is loamy sand and the subsurface layer is sand.

This soil is fairly well suited to many of the crops grown in the county, and fair yields can be expected under good management. The plow layer is easy to keep in good tilth and can be worked within a wide range of moisture content. Crops respond moderately well to fertilizer and lime. Nevertheless, less than half of the acreage is in cultivation. Use of this soil for crops is limited mainly by very low fertility, low available water capacity, severe leaching of nitrogen and potash in rainy periods, slope, runoff, and a hazard of wind erosion. (Capability unit IVs–1; woodland group 11; wildlife group 6)

Faceville Series

The Faceville series consists of deep, well-drained, nearly level to sloping soils of the uplands. These soils formed in moderately fine textured or fine textured sediments. The main layers of a typical profile are—

0 to 8 inches, grayish-brown, very friable loamy sand.
8 to 11 inches, strong-brown, friable sandy clay loam.
11 to 48 inches, yellowish-red, friable to firm, sticky sandy clay.

These soils are medium in natural fertility and available water capacity and are strongly acid or very strongly acid unless limed. Their organic-matter content is low. Water penetrates readily and moves through these soils at a moderate rate.

Faceville soils occur mainly in the central and southern parts of the county. They are well suited to all of the crops grown locally. Most of the acreage is in cultivation.

Faceville loamy sand, 0 to 2 percent slopes (FaA).—The surface layer of this soil is grayish-brown to brown loamy sand 8 to 12 inches thick. The subsoil is strong-brown to yellowish-red, sticky sandy clay to clay loam. Included in mapping were a few areas where the surface layer is sandy loam and the subsoil is sandy clay loam.

This soil is well suited to all of the crops grown in the county and is especially good for cotton. The plow layer is easy to keep in good tilth and can be worked within a wide range of moisture content without crusting. Most of the acreage is in cultivation, and crops respond well to fertilizer and lime. There are no serious limitations. (Capability unit I-1; woodland group 1; wildlife group 1)

Faceville loamy sand, 2 to 6 percent slopes (FaB).—The surface layer of this soil is grayish-brown to brown loamy sand 6 to 10 inches thick. The subsoil is strong-brown to yellowish-red sticky sandy clay to clay loam. Surface runoff is moderate. Included in mapping were a few areas where the surface layer is sandy loam and the subsoil is sandy clay loam.

This soil is well suited to all of the crops grown in the county and is especially good for cotton. The plow layer is easy to keep in good tilth and can be worked within a wide range of moisture content without crusting. Most of the acreage is in cultivation. Crops respond well to fertilizer and lime. Runoff causes a moderate erosion hazard. (Capability unit IIe–1; woodland group 1; wildlife group 1)

Faceville loamy sand, 2 to 6 percent slopes, eroded (FaB2).—The surface layer of this soil is grayish brown or dark grayish brown and is 4 to 8 inches thick. The subsoil is strong-brown to yellowish-red sticky sandy clay to clay loam. In places cultivation has brought some of the subsoil into the plow layer. A few spots are severely eroded, and in these the subsoil is exposed. Surface runoff is moderate. Included in mapping were small areas where the surface layer is sandy loam and the subsoil is sandy clay loam. The severely eroded areas are difficult to keep in good tilth, and in these the stands and yields of many crops are uneven.

This soil is well suited to all of the crops grown in the county and is especially good for cotton. Most of the acreage is in cultivation, and crops respond well to fertilizer and lime. Surface runoff and the hazard of erosion are the main limitations. (Capability unit IIe–1; woodland group 1; wildlife group 1)

Faceville loamy sand, 6 to 10 percent slopes, eroded (FaC2).—The surface layer of this soil is grayish brown or dark grayish brown and is 4 to 8 inches thick. The subsoil is strong-brown to yellowish-red sticky sandy clay to clay loam. In places cultivation has brought some of the subsoil into the plow layer. A few spots are severely eroded, and in these the subsoil is exposed. Surface runoff is rapid. Included in mapping were a few areas where the surface layer is sandy loam and the subsoil is sandy clay loam. The severely eroded areas are difficult to keep in good tilth.

This soil is well suited to all of the crops grown in the county. Most of the acreage is in cultivation, and crops respond well to fertilizer and lime. Use of this soil for crops is limited mainly by the rapid surface runoff, the slope, and the resulting erosion hazard. (Capability unit IIIe–1; woodland group 1; wildlife group 1)

Gilead Series

The Gilead series consists of well-drained, nearly level to strongly sloping, slightly cemented, brittle soils of the uplands. These soils formed in moderately fine textured or fine textured sediments. The main layers of a typical profile are—

0 to 7 inches, grayish-brown, very friable loamy sand.
7 to 25 inches, light yellowish-brown and pale-brown, firm, slightly cemented sandy clay loam.
25 to 60 inches, light-gray, firm, slightly cemented sandy clay loam with brownish-yellow, yellowish-brown, and red mottles.

These soils are low in natural fertility, medium in available water capacity, and very strongly acid unless limed. Their organic-matter content is low. In dry periods they are hard, but in wet periods they are sometimes boggy because internal drainage is restricted by the slightly cemented layer. Water penetrates readily but moves through the soils moderately slowly.

Gilead soils are extensive in the Sandhills part of the county. About half the acreage is used for cultivated crops and pasture. Except for Gilead loamy sand, 10 to 15 percent slopes, they are fairly well suited to most of the crops grown in the county and produce fair yields under good management.

Gilead loamy sand, 0 to 2 percent slopes (GdA).—The surface layer of this soil is gray to grayish brown and is 7 to 20 inches thick. The subsoil is light yellowish-brown or yellowish-brown, firm, slightly cemented sandy clay loam or sandy clay mottled with gray, red, and yellow. Seepage areas are common. Surface runoff is slow. Included in mapping were small areas where the surface layer is sandy loam.

Use of this soil is limited by low fertility and moderately slow permeability in the subsoil. The plow layer is difficult to keep in good tilth, and the moisture content at which the soils can be worked without clodding and crusting is narrow. Crops respond moderately well to applications of fertilizer and lime. Spot drainage is needed in some of the seepage areas and to drain the surface in some places. (Capability unit IIs–1; woodland group 4; wildlife group 1)

Gilead loamy sand, 2 to 6 percent slopes (GdB).—This soil has a gray surface layer 7 to 20 inches thick. Its subsoil is light yellowish-brown or yellowish-brown, firm, slightly cemented sandy clay loam to sandy clay mottled with gray, red, and yellow. Seepage areas are common. Surface runoff is medium. Included in mapping were small areas where the surface layer is sandy loam.

Use of this soil is limited by low fertility, moderately slow permeability in the subsoil, and medium runoff. (Capability unit IIe–3; woodland group 4; wildlife group 1)

Gilead loamy sand, 2 to 6 percent slopes, eroded (GdB2).—This soil has a gray or grayish-brown surface layer 4 to 10 inches thick. In places the present plow layer is a mixture of material from the original surface layer and material from the subsoil. The subsoil is light yellowish-brown or yellowish-brown, firm, slightly ce-

mented sandy clay loam to sandy clay mottled with gray, red, and yellow. Seepage areas are common. Surface runoff is medium. Included in mapping were small areas where the surface layer is sandy loam. Also included were a few severely eroded spots where the subsoil is exposed. Stands and yields of crops are uneven in severely eroded areas.

Use of this soil is limited by low fertility, moderately slow permeability in the subsoil, and medium runoff. (Capability unit IIe–3; woodland group 4; wildlife group 1)

Gilead loamy sand, 6 to 10 percent slopes (GdC).—This soil has a gray surface layer 7 to 20 inches thick. Its subsoil is light yellowish-brown or yellowish-brown, firm, slightly cemented sandy clay loam to sandy clay mottled with gray, red, and yellow. Surface runoff is rapid. Included in mapping were small areas where the surface layer is sandy loam and the subsoil is clay.

Use of this soil for crops is limited mainly by rapid runoff, the slope, moderately slow permeability in the subsoil, and low fertility. (Capability unit IIIe–2; woodland group 4; wildlife group 1)

Gilead loamy sand, 6 to 10 percent slopes, eroded (GdC2).—This soil has a gray or grayish-brown surface layer 3 to 10 inches thick. In places the present plow layer is a mixture of material from the original surface layer and material from the subsoil. The subsoil is light yellowish-brown or yellowish-brown, firm, slightly cemented sandy clay loam to sandy clay mottled with gray, red, and yellow. Surface runoff is rapid. Included in mapping were small areas where the surface layer is sandy loam and the subsoil is clay. Also included were a few severely eroded spots where the subsoil is exposed. Stands and yields of crops are uneven in severely eroded areas.

Use of this soil is limited mainly by rapid runoff, the slope, low fertility, and moderately slow permeability in the subsoil. (Capability unit IVe–1; woodland group 4; wildlife group 1)

Gilead loamy sand, 10 to 15 percent slopes (GdD).—This soil has a gray surface layer 4 to 10 inches thick. Its subsoil is light yellowish-brown or yellowish-brown, firm, slightly cemented sandy clay loam to sandy clay mottled with gray, red, and yellow. Surface runoff is rapid. Included in mapping were eroded areas of this soil, which make up about 10 percent of the acreage, and a few severely eroded areas. Also included were small areas where the surface layer is sandy loam and the subsoil is a thin layer of clay. Stands and yields of crops are uneven in severely eroded areas.

This soil is fairly well suited to some of the crops grown in this county, and it produces fair yields. Its use is limited by rapid runoff, the slope, moderately slow permeability in the subsoil, and low fertility. (Capability unit IVe–1; woodland group 4; wildlife group 1)

Goldsboro Series

The Goldsboro series consists of deep, moderately well drained, nearly level soils of the uplands. These soils formed in medium-textured or moderately fine textured sediments. The main layers of a typical profile are—

0 to 8 inches, dark-gray, very friable loamy sand.
8 to 16 inches, light yellowish-brown, very friable loamy sand.
16 to 32 inches, light yellowish-brown, friable sandy clay loam mottled with pale brown and light brownish gray in the lower 8 inches.
32 to 38 inches, mottled brownish-yellow, gray, pale-brown, and strong-brown, friable sandy clay loam.
38 to 42 inches +, gray, friable light sandy clay loam with common, distinct mottles of yellowish brown.

These soils are low in natural fertility, medium in available water capacity, and very strongly acid unless limed. Their organic-matter content is low. Water penetrates readily and moves through these soils at a moderate rate.

Goldsboro soils occur as small areas south of the Sandhills. They are well suited to all of the crops grown locally and are used mainly for cultivated crops.

Goldsboro loamy sand, 0 to 2 percent slopes (GoA).—The surface layer of this soil consists of 6 to 10 inches of gray or dark-gray loamy sand over 3 to 10 inches of very pale brown to light yellowish-brown loamy sand. Thickness of the sandy material ranges from 7 to 20 inches. The upper part of the subsoil is light olive-brown to yellowish-brown, friable sandy loam to sandy clay loam. Mottles of light brownish gray, gray, and strong brown occur in the lower part of the subsoil. Included in mapping were a few small areas that have a slope of as much as 4 percent. Also included were small areas where the surface layer is sandy loam.

This soil is well suited to all of the crops grown in the county. Response to fertilizer and lime is very good. For some specialized crops, such as tobacco, drainage may be needed. There are no serious hazards. (Capability unit IIw–1; woodland group 2; wildlife group 1)

Hoffman Series

The Hoffman series consists of well-drained or somewhat excessively drained, firm or very firm soils. These soils formed in fine-textured sediments. The main layers of a typical profile are—

0 to 5 nches, grayish-brown, very friable loamy sand.
5 to 16 inches, light-gray and pale-brown, very firm clay.
16 to 42 inches, mottled weak-red, strong-brown, pale-brown, and light brownish-gray, compact sandy clay with some fragments of ironstone.

These soils are very low in natural fertility, low in available water capacity, and very strongly acid. Their organic-matter content is low. Water penetrates at a moderate rate and moves slowly through the soil.

Hoffman soils occupy a small acreage in the Sandhills. They are not important to agriculture. Most of the acreage is wooded.

Hoffman loamy sand, 6 to 10 percent slopes, eroded (HfC2).—This soil has a gray to grayish-brown surface layer of loamy sand 3 to 10 inches thick. In places the present surface layer contains material from the subsoil, which is pale-brown and light-gray sandy clay to clay. Surface runoff is rapid. In a few places the surface layer is gravelly or its texture is sand or sandy loam. Included in mapping were spots that are uneroded and a few that are severely eroded. Tilth is poor in the severely eroded spots.

This soil is fairly well suited to a few perennial grasses and legumes, but it produces only fair yields. Response to fertilizer and lime is moderate. Use is limited by sur-

face runoff, the erosion hazard, slope, and the slowly permeable subsoil. (Capability unit VIe–1; woodland group 13; wildlife group 6)

Hoffman loamy sand, 10 to 20 percent slopes (HfD).—The surface layer of this soil is gray to grayish-brown loamy sand and is 5 to 10 inches thick. The subsoil is pale-brown and light-gray sandy clay to clay. Surface runoff is rapid. In a few places the surface layer is gravelly or its texture is sand or sandy loam. Included in mapping were a few eroded spots.

This soil is fairly well suited to a few perennial grasses and legumes. Use is limited by surface runoff, the erosion hazard, slope, and the slowly permeable subsoil. (Capability unit VIe–1; woodland group 13; wildlife group 6)

Johns Series

The Johns series consists of somewhat poorly drained, nearly level soils on stream terraces. These soils formed in moderately coarse textured to moderately fine textured old alluvium. The main layers of a typical profile are—

0 to 8 inches, dark-gray, very friable loamy sand.
8 to 15 inches, very pale brown, very friable sandy loam.
15 to 28 inches, light yellowish-brown, friable sandy clay loam mottled with gray, brownish yellow, and strong brown.
28 to 42 inches +, light-gray, loose sand with brownish-yellow mottles.

These soils are low in natural fertility, medium in available water capacity, and very strongly acid unless limed. Their organic-matter content is medium. Water penetrates readily and moves through these soils at a moderate rate.

Johns soils occur on most of the stream terraces in Scotland County. If drained, they are well suited to most of the crops grown in the county. About half the acreage is used for crops and pasture.

Johns loamy sand (Jo).—The surface layer of this soil consists of 5 to 10 inches of gray to very dark gray loamy sand over 3 to 10 inches of pale-yellow to light yellowish-brown loamy sand. The subsoil is light yellowish-brown to light olive-brown, friable to firm sandy loam to sandy clay loam mottled with gray, brownish yellow, and strong brown. Surface runoff is slow. Included in mapping were a few moderately well drained areas where the surface layer is sandy loam or loamy fine sand. Also included was a small acreage of soils that have a subsoil of firm clay.

If this soil is drained, it is well suited to most of the crops grown in the county. Response to fertilizer and lime is good. Use is limited mainly by wetness. (Capability unit IIw–2; woodland group 3; wildlife group 2)

Johnston Series

The Johnston series consists of very poorly drained soils on flood plains. These soils formed in moderately coarse textured or medium-textured sediments washed from uplands. They have a black, mucky surface layer 20 to 40 inches thick. The main layers of a typical profile are—

0 to 30 inches, black, very friable mucky loam.
30 to 50 inches, gray, friable fine sandy loam.
50 inches +, light-gray, loose sand.

These soils are low in natural fertility, medium in available water capacity, and very strongly acid. Their organic-matter content is high. Water moves through these soils at a moderate rate. Flooding is frequent, and water stands on the surface for long periods.

Small areas of Johnston soils occur along most of the streams in the county. All of the acreage is wooded, but if drained, these soils would be fairly well suited to a few of the crops grown in the county.

Johnston mucky loam (Jm).—The surface layer of this soil is black to very dark gray and is 20 to 40 inches thick. The subsurface layer is gray to very dark gray fine sandy loam to silty clay loam. In about 15 percent of the acreage, the surface layer is black loam 10 to 20 inches thick.

This soil is not used for crops and pasture, because of frequent flooding, extreme wetness, and the lack of suitable outlets for drainage. If drained, limed, and fertilized, this soil would be fairly well suited to a few of the crops grown in the county. Response to fertilizer and lime is moderate. (Capability unit IVw–4; woodland group 7; wildlife group 4)

Kalmia Series

The Kalmia series consists of well-drained, nearly level soils. These soils formed in moderately coarse textured to moderately fine textured old alluvium washed from uplands. The main layers of a typical profile are—

0 to 8 inches, grayish-brown, very friable loamy sand.
8 to 12 inches, light yellowish-brown, very friable loamy sand.
12 to 32 inches, brownish-yellow, friable sandy clay loam.
32 inches +, light yellowish-brown, loose sand.

These soils are low in natural fertility, medium in available water capacity, and strongly acid or very strongly acid unless limed. Their organic-matter content is low. Water penetrates readily and moves through these soils at a moderate rate.

Kalmia soils occur on most of the stream terraces. They are well suited to all of the crops grown in the county. Most of the acreage is used for row crops.

Kalmia loamy sand, 0 to 2 percent slopes (KaA).—The surface layer of this soil is gray to dark grayish-brown loamy sand and is 6 to 20 inches thick. The subsoil is brownish-yellow to strong-brown, friable fine sandy loam to sandy clay loam. Included in mapping were a few areas where the surface layer is sandy loam and loamy fine sand. About 4 percent of the acreage has slopes of 2 to 4 percent.

This soil is well suited to all of the crops grown in the county. The plow layer is easy to keep in good tilth and and can be worked within a wide range of moisture content. Response to fertilizer and lime is very good. There are no serious hazards. (Capability unit I–1; woodland group 1; wildlife group 1)

Kenansville Series

The Kenansville series consists of well-drained or somewhat excessively drained, nearly level or gently sloping soils of the uplands. These soils have a thick, sandy surface layer and a thin subsoil. They formed in moderately coarse textured sediments. The main layers of a typical profile are—

0 to 8 inches, dark-gray loamy sand.
8 to 22 inches, light yellowish-brown loamy sand.
22 to 36 inches, yellowish-brown, very friable sandy loam.
36 to 50 inches, brownish-yellow loamy sand.

These soils are low in natural fertility and available water capacity and are strongly acid or very strongly acid unless limed. Their organic-matter content is low. Water penetrates readily and moves through these soils at a moderately rapid rate.

The largest acreage of Kenansville soils is in the eastern part of the county. These soils are fairly well suited to most of the crops grown in the county. About two-thirds of the acreage is used for crops and pasture.

Kenansville loamy sand, 0 to 2 percent slopes (KnA).—The surface layer of this soil consists of gray to dark grayish-brown loamy sand over pale-brown to light yellowish-brown loamy sand. The surface layer is 20 to 30 inches thick and overlies a friable, brownish-yellow to strong-brown subsoil of sandy loam. The subsoil grades into very friable or loose, brownish loamy sand or sand at a depth of 30 to 42 inches. Included in mapping were small areas where the surface layer is sand.

This soil is fairly well suited to most of the crops grown in the county. Tilth is easily maintained, and the plow layer can be worked within a wide range of moisture content. Crops respond moderately well to fertilizer and lime. Use for crops and pasture is limited by low fertility, low available water capacity, susceptibility to wind erosion, and leaching of nitrogen and potash in rainy weather. (Capability unit IIs–1; woodland group 8; wildlife group 5)

Kenansville loamy sand, 2 to 6 percent slopes (KnB).—The surface layer of this soil consists of gray to dark grayish-brown loamy sand over pale-brown to light yellowish-brown loamy sand. The surface layer is 20 to 30 inches thick and overlies a friable, brownish-yellow to strong-brown subsoil of sandy loam. The subsoil grades into very friable or loose, brownish loamy sand or sand at a depth of 30 to 42 inches. Included in mapping were small areas where the surface layer is sand.

This soil is fairly well suited to most of the crops grown in the county. Tilth is easily maintained, and the plow layer can be worked throughout a wide range of moisture content. Crops respond moderately well to fertilizer and lime. Use for crops and pasture is limited mainly by low fertility, low available water capacity, susceptibility to wind erosion, and leaching of nitrogen and potash in rainy periods. Yields of most crops are slightly lower than on Kenansville loamy sand, 0 to 2 percent slopes, because soil-water relationships are somewhat less favorable. (Capability unit IIs–1; woodland group 8; wildlife group 5)

Lakeland Series

The Lakeland series consists of deep, somewhat excessively drained, nearly level to moderately steep soils of the uplands. These soils formed in coarse-textured sediments. They have a sandy surface layer more than 40 inches thick. The main layers of a typical profile are—

0 to 8 inches, grayish-brown, loose sand.
8 to 24 inches, pale-brown or pale-yellow, loose sand.
24 to 48 inches, yellowish-brown, loose sand.

These soils are very low in natural fertility and available water capacity and are strongly acid or very strongly acid unless limed. Their organic-matter content is very low. Water penetrates readily and moves through these soils rapidly.

Lakeland soils occur on uplands and stream terraces in all parts of the county but are most extensive in the Sandhills. About two-thirds of the acreage is wooded.

Lakeland sand, 0 to 10 percent slopes (lkB).—The surface layer of this soil is more than 40 inches thick. It consists of 2 to 9 inches of gray to grayish-brown sand over pale-yellow to strong-brown sand. Included in mapping are a few areas where the surface layer is loamy sand.

This soil is fairly well suited to many of the crops grown in the county, but yields are usually low. The plow layer can be worked throughout a wide range of moisture content. Crops respond moderately well to fertilizer and lime. Use for crops and pasture is limited mainly by low fertility, low available water capacity, susceptibility to wind erosion, and severe leaching of nitrogen and potash in rainy periods. (Capability unit IVs–1; woodland group 12; wildlife group 6)

Lakeland sand, 10 to 20 percent slopes (lkD).—The surface layer of this soil is more than 40 inches thick. It consists of 2 to 9 inches of gray to grayish-brown sand over pale-yellow to strong-brown sand. Surface runoff is moderate in cleared areas. Included in mapping were a few places where the soil is 30 to 40 inches deep, the surface layer is loamy sand, and the subsoil is sandy loam to sandy clay loam.

This soil is fairly well suited to some of the perennial grasses and legumes, but yields are usually low and only a few areas are used for these crops. Suitable perennials are sericea lespedeza, Coastal bermudagrass, and bahiagrass. Response to fertilizer and lime is moderate. Use for pasture crops is limited by very low fertility, very low available water capacity, and severe leaching of nitrogen and potash in rainy periods. (Capability unit VIIs–1; woodland group 12; wildlife group 6)

Lumbee Series

The Lumbee series consists of poorly drained soils that formed in moderately coarse textured to moderately fine textured old alluvium washed from the uplands. The main layers of a typical profile are—

0 to 6 inches, dark-gray, very friable loamy sand.
6 to 14 inches, light brownish-gray, very friable loamy sand.
14 to 36 inches, light-gray, friable to firm sandy clay loam with common mottles of brownish yellow.
36 to 48 inches, light-gray, very friable to loose loamy sand to sand; grades to small gravel.

These soils are low in natural fertility, medium in available water capacity, and very strongly acid unless limed. Their organic-matter content is medium. Water penetrates readily and moves through these soils at a moderate to moderately slow rate.

Lumbee soils occur on most of the low stream terraces. If drained, they are fairly well suited to a few of the crops grown in the county. Most of the acreage is wooded.

Lumbee loamy sand (lu).—The surface layer of this soil consists of 3 to 8 inches of dark gray or very dark gray loamy sand, and the subsurface layer of 3 to 12 inches of gray or dark gray loamy sand. The subsoil is friable to firm, gray or light-gray sandy loam to sandy

clay loam with mottles of strong brown and brownish yellow. Mottles range in number from few to common and are lacking in places. Surface runoff is slow to ponded. Flooding occurs occasionally, after heavy rain. Included in mapping were a few areas where the surface layer is sandy loam or loam. Also included were small areas where the subsoil is firm sandy clay to clay.

If this soil is drained, it is fairly well suited to a few of the crops grown in the county. Crops respond well to fertilizer and lime. The main limitations for crops and pasture are a high water table, a lack of suitable outlets for drainage, and occasional flooding. (Capability unit IVw–4; woodland group 5; wildlife group 4)

Lynchburg Series

The Lynchburg series consists of somewhat poorly drained soils on nearly level flats and in small depressions in the uplands. These soils formed in medium-textured sediments. The main layers of a typical profile are—

0 to 7 inches, dark-gray, very friable loamy sand.
7 to 13 inches, light olive-brown, friable light sandy clay loam.
13 to 30 inches, pale-brown, friable sandy clay loam mottled with strong brown, yellowish brown, and light brownish gray.
30 to 42 inches +, mottled, light-gray, pale-brown, strong-brown, and red, friable sandy clay loam.

These soils are low in natural fertility, medium in available water capacity, and very strongly acid unless limed. Their organic-matter content is medium. Water penetrates readily and moves through these soils at a moderate rate.

Lynchburg soils occur as small areas throughout the county, mainly south of the Sandhills. If drained, they are well suited to most of the crops grown in the county. Most of the acreage is cultivated or is used for pasture.

Lynchburg loamy sand (Ly).—The surface layer of this soil is gray to very dark gray loamy sand and is 7 to 20 inches thick. The subsoil is pale-brown to light olive-brown, friable sandy loam to sandy clay loam mottled with gray, strong brown, and yellowish brown below a depth of 12 inches. Surface runoff is slow, and some areas are ponded after heavy rain. Included in mapping were a few areas where the surface layer is sandy loam or loam.

Use is limited mainly by a moderately high water table. If this soil is drained, crops respond very well to fertilizer and lime. (Capability unit IIw–2; woodland group 3; wildlife group 2)

Mantachie Series

The Mantachie series consists of somewhat poorly drained soils that formed in local alluvium. The main layers of a typical profile are—

0 to 16 inches, grayish-brown, very friable loamy sand.
16 to 22 inches, very dark gray, very friable sandy loam.
22 to 42 inches +, light yellowish-brown, friable sandy clay loam with common medium mottles of strong brown and light gray.

These soils are low in natural fertility, medium in available water capacity, and very strongly acid unless limed. Their organic-matter content is medium. Water penetrates readily and moves through these soils at a moderate rate.

Mantachie soils occur throughout the county as very small, mainly narrow areas at the head of drainageways and on foot slopes. They are well suited to most of the crops grown in the county. Most of the acreage is cultivated.

Mantachie soils, local alluvium (Ma).—The alluvial deposits in which these soils formed is 16 inches or more in thickness and gray to very dark gray in color. The subsoil is pale-brown to light olive-brown sandy loam to sandy clay loam mottled with gray. Seepage spots are common. Surface runoff is slow to ponded. Included in mapping were small areas that have a surface layer of sandy loam or loam. Also included were a few areas that are moderately well drained.

Use for crops and pasture is limited by wetness and surface ponding. Crops respond moderately well to fertilizer and lime. (Capability unit IIw–2; woodland group 3; wildlife group 2)

Marlboro Series

The Marlboro series consists of deep, well-drained, nearly level or gently sloping soils of the uplands. These soils formed in moderately fine textured or fine textured sediments. The main layers of a typical profile are—

0 to 8 inches, grayish-brown, very friable loamy sand.
8 to 26 inches, yellowish-brown, friable and sticky sandy clay.
26 to 48 inches, brownish-yellow, friable and sticky sandy clay mottled with red and strong brown.

These soils are medium in natural fertility and available water capacity and are strongly acid or very strongly acid unless limed. They are low in organic-matter content. Water penetrates readily and moves through these soils at a moderately slow rate.

Marlboro soils are extensive in the vicinity of Laurinburg and Masons Crossroads. These are the best agricultural soils in the county. They are well suited to all of the crops grown locally and are especially good for cotton. Most of the acreage is cultivated.

Marlboro loamy sand, 0 to 2 percent slopes (MbA).—The surface layer of this soil is gray to grayish-brown loamy sand and is 6 to 12 inches thick. The subsoil is brownish-yellow to strong-brown, friable, sticky sandy clay. Included in mapping were small areas where the surface layer is sandy loam. Also included was a small acreage underlain by discontinuous sheets containing sesquioxides and layers of plinthitelike material.

This soil is used chiefly for row crops. The plow layer is easy to keep in good tilth and can be worked throughout a wide range of moisture content without clodding or crusting. Crops respond very well to fertilizer and lime. There are no serious hazards. (Capability unit I–1; woodland group 1; wildlife group 1)

Marlboro loamy sand, 2 to 6 percent slopes (MbB).—The surface layer of this soil is gray to grayish-brown loamy sand and is 6 to 12 inches thick. The subsoil is brownish-yellow to strong-brown, friable and sticky sandy clay. Included in mapping were small areas where the surface layer is sandy loam. Also included was a small acreage underlain by discontinuous sheets containing sesquioxides and having layers of plinthitelike material.

Most of this soil is used for cultivated crops. The plow layer is easy to keep in good tilth and can be worked throughout a wide range of moisture content without clodding or crusting. Crops respond very well to fertilizer and lime. Surface runoff causes a moderate erosion hazard. (Capability unit IIe–1; woodland group 1; wildlife group 1)

Marlboro loamy sand, 2 to 6 percent slopes, eroded (MbB2).—The surface layer of this soil is grayish-brown or dark grayish-brown loamy sand and is 4 to 7 inches thick. In places the present surface layer is a mixture of the original surface soil and material from the subsoil. In a few places the soil is severely eroded and the subsoil is exposed. Such areas are hard to keep in good tilth. Included in mapping were small areas that have a surface layer of sandy loam. Also included was a small acreage underlain by discontinuous sheets containing sesquioxides and layers of plinthitelike material.

This soil is used mainly for row crops. Response to fertilizer and lime is very good. Runoff causes a moderate erosion hazard. (Capability unit IIe–1; woodland group 1; wildlife group 1)

McColl Series

The McColl series consists of somewhat poorly drained or poorly drained soils in Carolina bays. These soils formed in moderately fine textured or fine textured sediments. The main layers of a typical profile are—

0 to 8 inches, very dark gray, very friable loam.
8 to 13 inches, light-gray, friable to firm sandy clay or clay.
13 to 30 inches, strong-brown and yellowish-brown, firm to friable sandy clay loam or sandy clay with many, coarse, gray mottles.
30 to 55 inches, light-gray, friable to firm sandy clay loam mottled with reddish yellow.

These soils are medium in natural fertility and available water capacity and are very strongly acid unless limed. Their organic-matter content is medium. Water penetrates at a moderate rate and moves through these soils at a moderately slow or slow rate.

McColl soils are fairly extensive south of the Sandhills. They are fairly well suited to a number of crops grown in the county. About half the acreage is used for crops and pasture, and the rest is wooded.

McColl loam (Mc).—The surface layer of this soil is gray to very dark gray loam and is 5 to 10 inches thick. The upper part of the subsoil is gray or light-gray sandy clay loam to clay and is 2 to 12 inches thick. The lower part of the subsoil is sandy clay loam to sandy clay with many strong-brown, yellowish-brown, yellowish-red, and gray mottles. Included in mapping were small areas where the surface layer is fine sandy loam or clay loam.

Natural drainage outlets are lacking; consequently, water stands on the surface for long periods and crops cannot be grown unless a complete system of artificial drainage is installed. Crops in drained areas respond well to fertilizer and lime. (Capability unit IIIw–2; woodland group 6; wildlife group 3)

Maxton Series

The Maxton series consists of well-drained, nearly level soils that have a yellowish-red to strong-brown subsoil. These soils formed in moderately coarse textured to moderately fine textured old alluvium washed from the uplands. The main layers of a typical profile are—

0 to 8 inches, grayish-brown, very friable loamy sand.
8 to 12 inches, pale-brown, very friable loamy sand.
12 to 39 inches, yellowish-red, friable sandy clay loam.
39 to 50 inches, reddish-yellow, loose sand.

These soils are low in natural fertility, medium in available water capacity, and strongly acid or very strongly acid unless limed. Their organic-matter content is low. Water penetrates readily and moves through these soils at a moderate rate.

Maxton soils occur on stream terraces, mostly along the Lumber River. They are well suited to most of the crops grown in the county. Most of the acreage is cultivated.

Maxton loamy sand, 0 to 2 percent slopes (MxA).—The surface layer of this soil is light brownish-gray to dark grayish-brown loamy sand and is 7 to 20 inches thick. The subsoil is yellowish-red to strong-brown, friable sandy loam to sandy clay loam. Included in mapping were small areas where the surface layer is sandy loam. About 10 percent of the acreage in this mapping unit has slopes of 2 to 4 percent.

This soil is well suited to most of the crops grown locally, and most of the acreage is cultivated. The plow layer is easy to keep in good tilth and can be worked throughout a wide range of moisture content. Crops respond very well to fertilizer and lime. There are no serious hazards. Runoff causes a slight erosion hazard on long slopes. (Capability unit I–1; woodland group 1; wildlife group 1)

Norfolk Series

The Norfolk series consists of deep, well-drained, nearly level to sloping soils of the uplands. These soils formed in moderately coarse textured to moderately fine textured sediments. The main layers of a typical profile are—

0 to 8 inches, grayish-brown, very friable loamy sand.
8 to 15 inches, pale-brown, very friable loamy sand.
15 to 18 inches, light yellowish-brown, friable sandy loam.
18 to 62 inches, yellowish-brown, friable sandy clay loam; a few mottles of strong brown below a depth of 30 inches.

These soils are low in natural fertility, medium in available water capacity, and strongly acid or very strongly acid unless limed. Their organic-matter content is low. Water penetrates readily and moves through these soils at a moderate rate.

Norfolk soils are extensive in the central and south-central parts of Scotland County. They are important agricultural soils, and most of the acreage is cultivated. They are especially good for growing cotton and tobacco.

Norfolk loamy sand, 0 to 2 percent slopes (NoA).—The surface layer of this soil consists of 7 to 10 inches of gray to dark grayish-brown loamy sand, and the subsurface layer of 3 to 10 inches of pale-yellow to pale-brown loamy sand. The subsoil is brownish-yellow to strong-brown, friable sandy loam to sandy clay loam. Included in mapping was a small acreage where the surface layer is sandy loam. Also included were small areas underlain by discontinuous sheets containing sesquioxides and layers of plinthitelike material.

This soil is well suited to all of the crops grown in the county, and most of the acreage is used for row crops. The plow layer is easy to keep in good tilth and can be worked

throughout a wide range of moisture content. Crops respond very well to fertilizer and lime. There are no serious hazards. Wind erosion and leaching are minor hazards. (Capability unit I–1; woodland group 1; wildlife group 1)

Norfolk loamy sand, 2 to 6 percent slopes (NoB).—The surface layer of this soil consists of 7 to 9 inches of gray to grayish-brown loamy sand, and the subsurface layer of 3 to 10 inches of pale-yellow to pale-brown loamy sand. The subsoil is brownish-yellow to strong-brown, friable sandy loam to sandy clay loam. Included in mapping was a small acreage where the surface layer is sandy loam. Also included were small areas underlain by discontinuous sheets containing sesquioxides and layers of plinthitelike material.

This soil is well suited to all of the crops grown in the county, and most of the acreage is used for row crops. The plow layer is easy to keep in good tilth and can be worked throughout a wide range of moisture content. Crops respond very well to fertilizer and lime. Surface runoff is moderate; it causes a moderate erosion hazard. (Capability unit IIe–1; woodland group 1; wildlife group 1)

Norfolk loamy sand, 2 to 6 percent slopes, eroded (NoB2).—The surface layer of this soil consists of 4 to 8 inches of grayish-brown to dark grayish-brown loamy sand, and the subsurface layer of 2 to 7 inches of pale-yellow to pale-brown loamy sand. The subsoil is brownish-yellow to strong-brown, friable sandy loam to sandy clay loam. In places the present plow layer is a mixture of the original surface layer and material from the subsoil. Included in mapping were some severely eroded spots where the subsoil is exposed. Also included was a small acreage where the surface layer is sandy loam, and small areas underlain by discontinuous sheets containing sesquioxides and layers of plinthitelike material.

This soil is well suited to all of the crops grown in the county, and most of the acreage is used for row crops. Except in the severely eroded spots, the plow layer is easy to keep in good tilth and can be worked within a wide range of moisture content. Crops respond very well to fertilizer and lime. Surface runoff is moderate; it causes a moderate erosion hazard. (Capability unit IIe–1; woodland group 1; wildlife group 1)

Norfolk loamy sand, 6 to 10 percent slopes, eroded (NoC2).—The surface layer of this soil is grayish-brown to dark grayish-brown loamy sand and is 4 to 8 inches thick. The subsoil is brownish-yellow to strong-brown, friable sandy clay loam. In many places the original surface layer is mixed with material from the subsoil. Included in mapping were a few spots that are severely eroded. Also included was a small acreage of sandy loam. In addition, there are small areas underlain by discontinuous sheets containing sesquioxides and layers of plinthitelike material. Uneroded areas make up about 15 percent of the acreage.

This soil is suited to most of the crops grown in the county, but most of the acreage is used for pasture. Except in the severely eroded spots, the plow layer is easy to keep in good tilth and can be worked throughout a wide range of moisture content. Crops respond moderately well to fertilizer and lime. Surface runoff is moderate; it causes a moderately severe erosion hazard in cultivated areas. (Capability unit IIIe–1; woodland group 1; wildlife group 1)

Ocilla Series

The Ocilla series consists of somewhat poorly drained, nearly level soils of the uplands and stream terraces. These soils formed in moderately coarse textured to moderately fine textured sediments. They have a sandy surface layer, 20 to 30 inches thick, and a subsoil of friable sandy loam to sandy clay loam. Generally, the soil on terraces is thinner than that on uplands. The main layers of a typical profile are—

0 to 8 inches, dark-gray, very friable loamy sand.
8 to 22 inches, very pale brown, very friable loamy sand.
22 to 44 inches, light yellowish-brown, friable sandy clay loam with common mottles of light brownish gray and brownish yellow.
44 to 50 inches +, light-gray, friable sandy clay loam with common mottles of yellowish brown, strong brown, and red.

These soils are low in natural fertility and available water capacity and are very strongly acid unless limed. Their organic-matter content is medium. Water penetrates readily and moves through these soils at a moderate rate.

Ocilla soils occur in small flats and depressions throughout the county but mostly south of the Sandhills. If drained, they are fairly well suited to most of the crops grown locally. About half of the acreage is used for crops and pasture.

Ocilla loamy sand (Oc).—The surface layer of this soil consists of 7 to 10 inches of gray to very dark gray loamy sand, and the subsurface layer of 10 to 20 inches of grayish-brown to light yellowish-brown, very friable loamy sand. The subsoil is pale-brown to light olive-brown, friable sandy clay loam to sandy loam, mottled with gray, strong brown, and yellowish brown. Surface runoff is slow. Included in mapping were areas where the surface layer is 30 to 50 inches thick and the subsoil is clayey.

If drained, this soil is well suited to most of the crops grown in the county. Most of the acreage is either cultivated or used for pasture. Crops respond well to fertilizer and lime. Use is limited mainly by a moderately high water table and moderately severe leaching of plant nutrients. (Capability unit IIw–2; woodland group 3: wildlife group 2)

Okenee Series

The Okenee series consists of very poorly drained, black soils on low stream terraces. These soils formed in moderately coarse textured to moderately fine textured old alluvium washed from uplands. The main layers of a typical profile are—

0 to 11 inches, black, very friable loam.
11 to 16 inches, very dark gray, very friable sandy loam.
16 to 28 inches, gray or light-gray, friable sandy clay loam.
28 to 42 inches +, gray or light-gray, loose, coarse sand; a little fine gravel.

These soils are low in natural fertility, medium in available water capacity, and very strongly acid. Their organic-matter content is high. Water ponds on the surface for long periods because drainage outlets are lacking.

In drained areas, water penetrates readily and moves through these soils at a moderate or moderately slow rate.

Okenee soils occur in scattered areas on the outer edge of terraces of the Lumber River and on terraces along smaller streams. Only a small acreage has been cleared, drained, and put into cultivation. If drained, these soils are fairly well suited to a few of the crops grown in the county.

Okenee loam (Ok).—The surface layer of this soil is black to very dark gray and is 8 to 20 inches thick. The subsoil is light-gray to dark-gray, friable sandy loam to sandy clay loam and is 12 to 30 inches thick. Included in mapping were small areas where the surface layer is fine sandy loam. Also included was a small acreage where the subsoil is firm sandy clay or silty clay.

If this soil is drained, it is fairly well suited to a few of the crops grown in the county. Response to fertilizer and lime is good. Use of this soil for crops and pasture is limited mainly by a high water table, lack of drainage outlets, and occasional flooding. (Capability unit IIIw–3; woodland group 5; wildlife group 4)

Orangeburg Series

The Orangeburg series consists of deep, well-drained, nearly level to sloping soils of the uplands. These soils formed in moderately coarse textured to moderately fine textured sediments. The main layers of a typical profile are—

0 to 5 inches, brown, very friable loamy sand.
5 to 10 inches, yellowish-brown, very friable loamy sand.
10 to 48 inches +, yellowish-red, friable sandy clay loam.

These soils are low in natural fertility, medium in available water capacity, and strongly acid or very strongly acid unless limed. Their organic-matter content is low. Water penetrates readily and moves through these soils at a moderate rate.

Orangeburg soils are not extensive in Scotland County. The largest acreage is in the central part of the county. These soils are well suited to all of the crops grown in the county, and most of the acreage is cultivated.

Orangeburg loamy sand, 0 to 2 percent slopes (OrA).—The surface layer of this soil is light brownish gray to dark grayish brown and is 7 to 10 inches thick. The subsoil is strong-brown to red, friable sandy loam to sandy clay loam. Included in mapping were small areas where the surface layer is sandy loam.

This soil is well suited to all of the crops grown in the county. Most of the acreage is used for row crops. The plow layer is easy to keep in good tilth and can be worked throughout a wide range of moisture content. Response to fertilizer and lime is very good. There are no serious hazards, but surface runoff causes a moderate or moderately severe erosion hazard in the areas that are in the upper part of the slope range. (Capability unit I–1; woodland group 1; wildlife group 1)

Orangeburg loamy sand, 2 to 6 percent slopes (OrB).—The surface layer of this soil is light brownish-gray to dark grayish-brown loamy sand and is 6 to 9 inches thick. The subsoil is strong-brown to red, friable sandy loam to sandy clay loam. Included in mapping were small areas where the surface layer is sandy loam.

This soil is well suited to all of the crops grown in the county. Most of the acreage is used for row crops. The plow layer is easy to keep in good tilth and can be worked throughout a wide range of moisture content. Crops respond very well to fertilizer and lime. Surface runoff is moderate; it causes a moderate erosion hazard. (Capability unit IIe–1; woodland group 1; wildlife group 1)

Orangeburg loamy sand, 2 to 6 percent slopes, eroded (OrB2).—The surface layer of this soil is grayish-brown to dark grayish-brown loamy sand and is 4 to 8 inches thick. The subsoil is strong-brown to red, friable sandy loam to sandy clay loam. In places the plow layer is a mixture of the original surface layer and part of the subsoil. A few spots are severely eroded. Included in mapping were small areas where the surface layer is sandy loam.

This soil is well suited to most of the crops grown in the county. Most of the acreage is used for row crops. Except in the severely eroded spots, the plow layer is easy to keep in good tilth and can be worked throughout a wide range of moisture content. Response to fertilizer and lime is very good. Surface runoff is moderate; it causes a moderate erosion hazard. (Capability unit IIe–1; woodland group 1; wildlife group 1)

Orangeburg loamy sand, 6 to 10 percent slopes, eroded (OrC2).—The surface layer of this soil is grayish-brown or dark grayish-brown loamy sand 4 to 7 inches thick. The subsoil is strong-brown to red, friable sandy clay loam. In places the plow layer is a mixture of the original surface layer and part of the subsoil. A few spots are severely eroded. Included in mapping were a few small areas where the surface layer is sandy loam. Also included were areas where the slope is 10 to 15 percent; these make up about 15 percent of the acreage.

This soil is well suited to most of the crops grown in the county. About half of the acreage is used for crops and pasture. Except in the severely eroded spots, the plow layer is easy to keep in good tilth and can be worked within a wide range of moisture content. Crops respond moderately well to fertilizer and lime. Surface runoff is moderately rapid; it causes a moderately severe erosion hazard in cultivated areas. (Capability unit IIIe–1; woodland group 1; wildlife group 1)

Plummer Series

The Plummer series consists of poorly drained sands and loamy sands of the uplands and stream terraces. These soils formed in coarse-textured sediments on flats, in drainageways, on seepage slopes, and in depressions. They are sandy to a depth of 40 to 60 inches. The main layers of a typical profile are—

0 to 8 inches, very dark gray, very friable loamy sand.
8 to 42 inches, gray or light-gray, very friable loamy sand.
42 to 48 inches, light-gray, friable sandy loam with common brownish-yellow and light yellowish-brown mottles.

These soils are very low in natural fertility, low in available water capacity, and very strongly acid. Their organic-matter content is low or medium. Water penetrates rapidly and moves through these soils at a rapid rate.

Plummer soils occur as small areas throughout the county. If drained, they are fairly well suited to a few of the crops grown locally, but yields are generally low. Most of the acreage is wooded.

Plummer loamy sand (Pl).—The surface layer of this soil is thin, gray to very dark gray loamy sand over light-

gray to dark-gray loamy sand or sand. Surface runoff is slow, and undrained areas are ponded after heavy rain.

If this soil is drained, it is fairly well suited to a few of the crops grown in the county, but yields are generally low. Crops respond moderately well to fertilizer and lime. Use for crops and pasture is limited mainly by a high water table, lack of drainage outlets, very low fertility, and leaching of nitrogen and potash in rainy periods. (Capability unit IVw–1; woodland group 10; wildlife group 4)

Plummer sand (Ps).—The surface layer of this soil is thin, gray to very dark gray sand over gray or light-gray sand or loamy sand. Surface runoff is slow, and undrained areas are ponded after heavy rain. Included in mapping were a few areas of a soil where the subsoil contains a compacted layer, at a depth of 2 to 4 feet, that is high in organic-matter content.

If this soil is drained, it is fairly well suited to a few perennial pasture plants. Response to fertilizer and lime is moderately good. Use for pasture is limited mainly by a high water table, a lack of drainage outlets, very low fertility, and severe leaching of nitrogen and potash in rainy periods. (Capability unit Vw–1; woodland group 10; wildlife group 4)

Portsmouth Series

The Portsmouth series consists of very poorly drained, black soils in nearly level areas and in slight depressions. These soils formed in medium-textured or moderately fine textured sediments. The layers of a typical profile are—

0 to 10 inches, black, very friable loam.
10 to 28 inches, gray, friable or firm sandy clay loam.
28 to 50 inches, gray, friable sandy loam.

These soils are low in natural fertility, medium in available water capacity, and very strongly acid unless limed. Their organic-matter content is high. Water moves through these soils at a moderate or moderately slow rate.

Portsmouth soils occur in small to large Carolina bays in the central and southern parts of the county. About half of the acreage is used for pasture and cultivated crops.

Portsmouth loam (Pt).—The surface layer of this soil is black loam and is 8 to 20 inches thick. The subsoil is light-gray to dark-gray, friable or firm sandy loam to light sandy clay. Surface runoff is slow to ponded. Included in mapping were small areas of soils that have a coarser textured subsoil. Also included were areas of soils that have a finer textured subsoil.

About half the acreage is used for row crops and pasture, and the rest is wooded. If the soil is drained, crops respond well to fertilizer and lime. A complete drainage system is needed to make this soil suitable for crops or pasture, because the hazard of flooding is severe and in many places drainage outlets are inadequate. (Capability unit IIIw–3; woodland group 5; wildlife group 3)

Rains Series

The Rains series consists of poorly drained upland soils on broad flats and in Carolina bays. These soils formed in moderately coarse textured or moderately fine textured sediments. The main layers of a typical profile are—

0 to 6 inches, very dark gray, very friable fine sandy loam.
6 to 14 inches, gray, very friable fine sandy loam.
14 to 30 inches, gray, friable sandy clay loam.
30 to 56 inches, gray, friable or firm sandy clay loam mottled with brownish yellow.

These soils are low in natural fertility, medium in available water capacity, and very strongly acid unless limed. Their organic-matter content is medium. Water penetrates at a moderate rate and moves through these soils at a moderate or moderately slow rate.

Rains soils are fairly extensive in the central and southern parts of the county and occupy a smaller acreage in the Sandhills. If drained, they are well suited to a number of crops grown in the county, and they are locally important to agriculture. About two-thirds of the acreage is wooded, and the rest is used for crops and pasture.

Rains fine sandy loam (Ra).—The surface layer of this soil is gray to very dark gray fine sandy loam 10 to 20 inches thick. The subsoil is gray or light-gray, friable sandy loam to sandy clay loam. Medium, distinct mottles of brownish yellow to strong brown occur in the subsoil and are common in places. Surface runoff is slow to ponded. Included in mapping are small areas where the surface layer is loam or sandy loam and a few areas where the surface layer is 20 to 30 inches thick.

If drained, this soil is well suited to many of the crops grown in the county. Response to fertilizer and lime is good. About one-third of the acreage is used for cultivated crops and pasture. Use is limited mainly by a high water table. Drainage outlets are inadequate in many places. (Capability unit IIIw–3; woodland group 5; wildlife group 3)

Rutlege Series

The Rutlege series consists of black, very poorly drained sands and loamy sands of the uplands and stream terraces. These soils formed in coarse-textured sediments in areas where the level of ground water was high. The main layers of a typical profile are—

0 to 11 inches, black, very friable loamy sand.
11 to 40 inches, light-gray, very friable loamy sand.
40 to 46 inches +, white, very friable loamy sand.

These soils are very low or low in natural fertility, low in available water capacity, and very strongly acid. Water penetrates at a moderate rate and moves rapidly through these soils.

Rutlege soils occur throughout the county, in small Carolina bays and along drainageways. If drained, they are fairly well suited to a few of the crops grown locally, but yields are generally low. Most of the acreage is wooded.

Rutlege loamy sand (Ru).—The surface layer of this soil consists of 8 to 20 inches of black to very dark gray loamy sand over light-gray to dark-gray loamy sand or sand. Surface runoff is slow, and most areas are ponded after heavy rain. Included in mapping were small areas where the surface layer is loam or sand.

If drained, this soil is fairly well suited to a few of the crops grown locally, but yields are generally low. Most of the acreage is in trees. Response to fertilizer and lime is moderately good. Use for crops and pasture is limited mainly by a high water table, a lack of drainage

outlets, low fertility, and leaching of plant nutrients. (Capability unit IVw–1; woodland group 10; wildlife group 4)

St. Lucie Series

The St. Lucie series consists of white, excessively drained, gently sloping soils of the uplands. These soils formed in thick beds of sand. The main layers of a typical profile are—

0 to 3 inches, gray, loose sand.
3 to 11 inches, light-gray, loose, coarse sand.
11 to 50 inches +, white, loose, coarse sand.

These soils are very low in natural fertility and available water capacity and are very strongly acid. Their organic-matter content is very low. Water penetrates readily and moves through these soils at a rapid rate.

St. Lucie soils occupy only a small acreage in this county, most of it around McArn Bay and the southeast rim of Goose Pond. All of the acreage is in scattered scrub oaks and a few longleaf pines.

St. Lucie sand (Sl).—The surface layer of this soil consists of 2 to 5 inches of gray or light-gray sand over several feet of light-gray to white loose sand. A very thin layer of coarse white sand is at the surface. Included in mapping were small areas of soils that have organic stains in the lower part.

This soil is not suited to crops or pasture, because of very low fertility, very low available water capacity, and very severe leaching of plant nutrients. All of the acreage is in scattered scrub oaks and a few longleaf pines. (Capability unit VIIs–1; woodland group 14; wildlife group 7)

Smoothed Sandy Land

Smoothed sandy land (Sm) consists of areas that have been altered by man. It includes areas that have been filled with soil material or areas that have been excavated mainly for the purpose of leveling. The original soils in these areas were mainly of the Norfolk, Orangeburg, Lakeland, Eustis, and Lynchburg series.

Smoothed sandy land is not extensive in this county. The largest area is near Laurinburg. Most of the acreage is used for grazing. Variability of soil characteristics is such that interpretations for these areas require on-site investigation. (Woodland group 16; wildlife group 7; not assigned to a capability unit)

Swamp

Swamp (Sw) consists of very poorly drained soils that are variable in texture. Stream channels are poorly defined in these areas and the soils are frequently flooded for long periods. This land type is fairly extensive in the county, and all of it is wooded. (Capability unit VIIw–1; woodland group 15; wildlife group 4)

Vaucluse Series

The Vaucluse series consists of well-drained or somewhat excessively drained, moderately deep soils of the uplands. These soils formed in red to strong-brown, firm, fine-textured to moderately coarse textured sediments. The main layers of a typical profile are—

0 to 3 inches, dark grayish-brown, loose loamy sand.
3 to 12 inches, light yellowish-brown, loose loamy sand or sand.
12 to 26 inches, reddish-yellow, firm, slightly cemented sandy clay loam or sandy loam.
26 to 52 inches, red and reddish-yellow, compact, slightly cemented sandy clay loam to sandy loam.

These soils are very low in natural fertility, low in available water capacity, and very strongly acid unless limed. Their organic-matter content is very low. Water penetrates readily and moves through these soils slowly or moderately slowly.

Vaucluse soils occur in the Sandhills. They are not extensive and are not important to agriculture. They are fairly well suited to many of the crops grown in the county, but yields are generally low. Most of the acreage is in cutover woodland.

Vaucluse loamy sand, 2 to 6 percent slopes (VaB).—The surface layer of this soil consists of 6 to 10 inches of grayish-brown or dark grayish-brown loamy sand overlying 3 to 12 inches of very pale brown to yellowish-brown loamy sand. The subsoil is red to strong-brown, firm, slightly cemented sandy clay loam to sandy loam. Surface runoff is moderate. Included in mapping were small areas of a Vaucluse soil having thin, irregular layers of ironstone in its subsoil.

This soil is fairly well suited to many of the crops grown in the county, but yields are generally low. Response to fertilizer and lime is moderate. Most of the acreage is in cutover woodland. Use for crops and pasture is limited by very low fertility, low available water capacity, surface runoff, and slow permeability. (Capability unit IIe–3; woodland group 13; wildlife group 1)

Vaucluse loamy sand, 2 to 6 percent slopes, eroded (VaB2).—The surface layer of this soil is grayish brown or dark grayish brown and 4 to 7 inches thick. In places the present plow layer is a mixture of material from the original surface layer and part of the subsoil. The subsoil is red to strong-brown, firm, slightly cemented sandy clay loam to sandy loam. Surface runoff is moderate. Included in mapping were small areas of Vaucluse soils having thin, irregular layers of ironstone in the subsoil. Also included were a few severely eroded spots.

This soil is fairly well suited to many of the crops grown in the county, but yields are generally low. Response to fertilizer and lime is moderate. Tilth is hard to maintain in the severely eroded areas. Most of the acreage is in cutover woodland. Use of this soil for crops and pasture is limited by very low fertility, low available water capacity, surface runoff, and slow permeability. (Capability unit IIIe–2; woodland group 13; wildlife group 1)

Vaucluse loamy sand, 6 to 10 percent slopes (VaC).—The surface layer of this soil consists of 6 to 10 inches of grayish-brown or dark grayish-brown loamy sand over 3 to 12 inches of very pale brown to yellowish-brown loamy sand. The subsoil is red to strong-brown, firm, slightly cemented sandy clay loam to sandy loam. Surface runoff is rapid. Included in mapping were small areas of a Vaucluse soil having thin, irregular layers of ironstone in its subsoil.

This soil is fairly well suited to many of the crops grown in the county, but yields are generally low. Response to fertilizer and lime is moderate. Use for crops and pasture

is limited by very low fertility, low available water capacity, surface runoff, and slow permeability. (Capability unit IIIe–2; woodland group 13; wildlife group 1)

Vaucluse loamy sand, 6 to 10 percent slopes, eroded (VaC2).—The surface layer of this soil is grayish-brown or dark grayish-brown loamy sand 4 to 7 inches thick. In places the present plow layer is a mixture of material from the original surface layer and part of the subsoil. The subsoil is red to strong-brown, firm, slightly cemented sandy clay loam to sandy loam. Surface runoff is rapid. Included in mapping were small areas of Vaucluse soils having thin, irregular layers of ironstone in its subsoil. Also included were a few severely eroded spots.

This soil is fairly well suited to many of the crops grown in the county, but yields are generally low. Response to fertilizer and lime is moderate. Tilth is hard to maintain in the severely eroded areas. Use of this soil for crops and pasture is limited by very low fertility, low available water capacity, surface runoff, and slow permeability. (Capability unit IVe–1; woodland group 13; wildlife group 1)

Vaucluse loamy sand, 10 to 15 percent slopes (VaD).—The surface layer of this soil is grayish-brown or dark grayish-brown loamy sand 6 to 10 inches thick. The subsoil is red to strong-brown, firm, slightly cemented sandy clay loam to sandy loam. Included in mapping were small areas of Vaucluse soils having thin, irregular layers of ironstone in the subsoil.

This soil is fairly well suited to many of the crops grown in the county, but yields are generally low. Response to fertilizer and lime is moderate. Use for crops and pasture is limited by very low fertility, low available water capacity, surface runoff, and slow permeability. (Capability unit IVe–1; woodland group 13; wildlife group 1)

Vaucluse loamy sand, 10 to 15 percent slopes, eroded (VaD2).—The surface layer of this soil is grayish-brown or dark grayish-brown loamy sand 4 to 7 inches thick. The subsoil is red to strong-brown, firm, slightly cemented sandy clay loam to sandy loam. Surface runoff is rapid. Included in mapping were small areas of Vaucluse soils having thin, irregular layers of ironstone in the subsoil. Also included were a few severely eroded spots. About one-fifth of the acreage is made up of soils having slopes of 15 to 25 percent.

This soil is fairly well suited to a few perennial grasses and legumes grown in the county. Crops respond moderately well to fertilizer and lime. Most of the acreage is wooded. Use for crops and pasture is limited by very low fertility, low available water capacity, runoff, and slow permeability. (Capability unit VIe–1; woodland group 13; wildlife group 1).

Wagram Series

The Wagram series consists of deep, well-drained or somewhat excessively drained, nearly level to strongly sloping loamy sands and sands on uplands and stream terraces. These soils formed in coarse-textured to moderately fine textured sediments. Their surface layer consist of 20 to 40 inches of sand. The main layers of a typical profile are—

0 to 8 inches, grayish-brown, very friable loamy sand.
8 to 24 inches, pale-brown, very friable loamy sand.
24 to 60 inches, yellowish-brown friable sandy clay loam with mottles of strong brown and yellowish red below a depth of 34 inches.

In this county some of the soils in this series have a surface layer 30 to 40 inches thick. The main layers of a typical profile are—

0 to 8 inches, grayish-brown, loose sand.
8 to 36 inches, very pale brown, loose sand.
36 to 60 inches, yellowish-brown, friable sandy clay loam.

These soils are low or very low in natural fertility and available water capacity and are strongly acid or very strongly acid unless limed. Their organic-matter content is low or very low. Water penetrates readily and moves through these soils at a moderate or rapid rate.

Wagram soils are extensive and occur in all parts of the county. They are fairly well suited to most of the crops grown locally. About half of the acreage is used for cultivated crops and pasture.

Wagram loamy sand, 0 to 2 percent slopes (WaA).—This soil is well drained. Its plow layer is gray to dark grayish-brown loamy sand over 10 to 20 inches of pale-yellow to light yellowish-brown loamy sand. The subsoil is brownish-yellow to yellowish-red, friable sandy loam to sandy clay loam. Included in mapping was a small acreage of moderately well drained soils.

This soil is fairly well suited to most of the crops grown in the county, but yields are generally low. The plow layer is easy to keep in good tilth and can be worked throughout a wide range of moisture content. Crops respond well to fertilizer and lime. Most of the acreage is cultivated. Use is limited by low fertility, droughtiness, leaching of nitrogen and potash in rainy weather, and susceptibility to wind erosion. (Capability unit IIs–1; woodland group 8; wildlife group 5)

Wagram loamy sand, 2 to 6 percent slopes (WaB).—This soil is well drained. Its plow layer is gray to dark grayish-brown loamy sand over 10 to 20 inches of pale-yellow to light yellowish-brown loamy sand. The subsoil is brownish-yellow to yellowish-red, friable sandy loam to sandy clay loam.

This soil is fairly well suited to most of the crops grown in the county, but yields are generally low. The plow layer is easy to keep in good tilth and can be worked throughout a wide range of moisture content. Crops respond well to fertilizer and lime. Most of the acreage is cultivated. Use is limited by low fertility, droughtiness, leaching of nitrogen and potash in rainy weather, and susceptibility to wind erosion. (Capability unit IIs–1; woodland group 8; wildlife group 5)

Wagram loamy sand, 6 to 10 percent slopes (WaC).—This soil is well drained. Its plow layer is gray to dark grayish-brown sand over 10 to 20 inches of pale-yellow to light yellowish-brown loamy sand. The subsoil is brownish-yellow to yellowish-red, friable sandy loam to sandy clay loam.

This soil is fairly well suited to most of the crops grown in the county, but yields are generally low. The plow layer is easy to keep in good tilth and can be worked throughout a wide range of moisture content. Crops respond well to fertilizer and lime. Most of the acreage is wooded. Use is limited by low fertility, droughtiness, moderately severe leaching of nitrogen and potash in rainy

weather, and runoff. (Capability unit IIIe–3; woodland group 8; wildlife group 5)

Wagram sand, thick surface, 0 to 6 percent slopes (WsB).—This soil is somewhat excessively drained. Its surface layer is gray to grayish-brown sand over 24 to 36 inches of pale-yellow to pale-brown sand. The subsoil is brownish-yellow to yellowish-red, friable sandy loam to sandy clay loam. Included in mapping were a few areas that have a surface layer of loamy sand.

This soil is fairly well suited to many of the crops grown in the county, but yields are generally low. The plow layer is easy to keep in good tilth and can be worked throughout a wide range of moisture content. Crops respond moderately well to fertilizer and lime. Most of the acreage is wooded, but large areas are used for cultivated crops and pasture. Use is limited mainly by low fertility, droughtiness, severe leaching of nitrogen and potash in rainy weather, and susceptibility to wind erosion. (Capability unit IIIs–1; woodland group 11; wildlife group 6)

Wagram sand, thick surface, 6 to 10 percent slopes (WsC).—This soil is somewhat excessively drained. Its surface layer is gray to grayish-brown sand over 24 to 36 inches of pale-yellow to pale-brown sand. The subsoil is brownish-yellow to yellowish-red, friable sandy loam to sandy clay loam. Surface runoff is moderate in cultivated areas.

This soil is fairly well suited to many of the crops grown in the county, but yields are generally low. The plow layer is easy to keep in good tilth and can be worked throughout a wide range of moisture content. Crops respond moderately well to fertilizer and lime. Most of the acreage is wooded. Use is limited mainly by very low fertility, droughtiness, severe leaching of nitrogen and potash in rainy weather, runoff, and susceptibility to wind erosion. (Capability unit IVs–1; woodland group 11; wildlife group 6)

Wagram sand, thick surface, 10 to 15 percent slopes (WsD).—This soil is somewhat excessively drained. Its surface layer is gray to grayish-brown sand over 24 to 36 inches of pale-yellow to pale-brown sand. The subsoil is brownish-yellow to yellowish-red, friable sandy loam to sandy clay loam. Surface runoff is moderately rapid in cultivated areas. Included in mapping were areas that have slopes of 15 to 25 percent. Such areas make up about 5 percent of the acreage.

This soil is fairly well suited to a few perennial grasses and legumes, but yields are generally low. Crops respond moderately well to fertilizer and lime. Most of the acreage is wooded. Use is limited mainly by very low fertility, droughtiness, severe leaching of nitrogen and potash in rainy weather, and runoff. (Capability unit VIIs-1; woodland group 11; wildlife group 6)

Use and Management of the Soils

This section discusses use and management of the soils for crops and pasture, woodland, wildlife, and engineering. It does not give detailed information about management of individual soils. For specific suggestions, consult a representative of the local office of the Soil Conservation Service, the Extension Service, or the Agricultural Experiment Station.

Use of the Soils for Crops and Pasture[2]

This section has four main parts. The first discusses capability grouping of soils by classes, subclasses, and units; the second discusses general principles of soil management; the third discusses management by capability units; and the fourth discusses estimated yields of suitable crops under high-level management.

Capability groups of soils

Capability classification is the grouping of soils to show, in a general way, their suitability for most kinds of farming. It is a practical classification based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment. The soils are classified according to degree and kind of permanent limitation, but without consideration of major and generally expensive landforming that would change the slope, depth, or other characteristics of the soils; and without consideration of possible but unlikely major reclamation projects.

In the capability system, all kinds of soils are grouped at three levels: the capability class, the subclass, and the unit. These are discussed in the following paragraphs.

Capability Classes, the broadest grouping, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use, defined as follows:

Class I soils have few limitations that restrict their use.

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

Class III soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.

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

Class V soils are subject to little or no erosion but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife food and cover.

Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife food and cover.

Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to grazing, woodland, or wildlife.

Class VIII soils and landforms have limitations that preclude their use for commercial plant production and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes.

Capability Subclasses are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation

[2] C. C. Abernathy, management agronomist, Soil Conservation Service, assisted with preparation of this section.

(in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow or droughty; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at most, only subclasses indicated by *w*, *s*, and *c* because the soils in it are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation.

CAPABILITY UNITS are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe–1 or IIIw–1. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation, and the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph. The Arabic numeral specifically identifies the capability unit within each subclass.

General principles of soil management

The soils of this county present management problems in three major categories: erosion by water and wind, excessive wetness, and low fertility and available water capacity. These are discussed in the following paragraphs.

EROSION.—The cultivable soils of the *e* subclass occupy nearly 12 percent of the land area in the county. When used for cultivated crops, these soils require practices that control water erosion. Some of the practices that check erosion are use of conservation cropping systems; stripcropping; management of crop residue; establishment of field borders, windbreaks, and grassed waterways; the use of terraces and diversions; and contour farming.

WETNESS.—The cultivable soils of the *w* subclass occupy about 24 percent of the land area. If these soils are used for cultivated crops, artificial drainage is needed for best crop yields. Most of the wet land can be drained either by open ditches or tile. Both methods are practical and economical. The spacing of the ditches or tile lines should be determined according to the characteristics of the soil and the needs of the crop to be grown. On sandy soils that have a friable subsoil, such as Lynchburg loamy sand, the spacing can be wider than on finer textured soils having a tight, slowly permeable subsoil, such as Coxville loam. Tobacco plants are less tolerant of excess water than corn and need a more intensive drainage system. Locating outlets for drainage systems is a major problem in some areas.

FERTILITY AND AVAILABLE WATER CAPACITY.—The cultivable soils of the *s* subclass occupy about 43 percent of the land area. These soils, most of which have a thick surface layer of sand or loamy sand, are low or very low in natural fertility and available water capacity. If cultivated, they need a cropping system that supplies large amounts of plant residue. Most of these soils respond well to additions of fertilizer and lime. The amount applied should be based on the results of soil tests, the needs of the crop to be grown, past cropping history, and the level of yield desired. Large amounts, preferably in split applications, are necessary for high yields. Control of insects and disease is also necessary.

Management by capability units

In the following pages the capability units in Scotland County are described and suggestions for use and management of the soils are given. The soils assigned to each unit can be identified by referring to the "Guide to Mapping Units" at the back of this report.

CAPABILITY UNIT I–1

This unit consists of deep, well-drained, nearly level soils on uplands and stream terraces. These soils have a surface layer of very friable loamy sand. Their subsoil is friable or firm sandy loam to sandy clay.

The soils in this unit are low or medium in natural fertility, medium in available water capacity, and very strongly acid. Their organic-matter content is low. Water penetrates readily but moves through these soils at a moderate or moderately slow rate. The plow layer is easy to keep in good tilth and can be worked throughout a wide range of moisture content. Crops respond well to fertilizer and lime.

These soils are well suited to all of the crops grown in the county. The main crop is cotton (fig. 5), but a large part of the acreage is used for corn, soybeans, small grain, and tobacco. Peaches and pecans are also suited.

There are no serious hazards in intensive use of these soils for row crops. The return of all crop residue will improve organic-matter content and help to maintain good tilth.

The soils in this unit make up 9 percent of the county. Most of the acreage is used for cultivated crops and pasture; a small part is wooded.

CAPABILITY UNIT IIe–1

This unit consists of deep, well-drained, gently sloping soils on uplands. These soils are slightly or moderately eroded. They have a surface layer of very friable loamy sand. Their subsoil is friable or firm sandy loam to sandy clay. In places the present plow layer is a mixture of the original surface layer and part of the subsoil.

The soils in this unit are low or medium in natural fertility, medium in available water capacity, and strongly acid or very strongly acid. Their organic-matter content is low. Water penetrates readily but moves through these soils at a moderate or moderately slow rate. The plow layer is easy to keep in good tilth and can be worked throughout a wide range of moisture content. Crops respond well to fertilizer and lime.

These soils are well suited to all of the crops grown in the county. The main crop is cotton, but a large part of the acreage is used for corn, soybeans, small grain, tobacco, sericea lespedeza, and Coastal bermudagrass. Peaches and pecans are suited also. An example of a suitable cropping system is 3 years of row crops and 1 year of close-growing crops. Another example is 1 or 2 years of row crops, followed by 1 or more years of close-growing crops.

If these soils are cultivated, there is a moderate hazard of erosion. Runoff and erosion can be controlled and tilth can be improved by returning all crop residue to the soil, using close-growing crops in the rotations, cultivating on

Figure 5.—**Cotton growing on Marlboro loamy sand, 0 to 2 percent slopes. This soil is assigned to capability unit I–1. It is especially good for cotton.**

the contour, establishing diversions and constructing terraces, and stripcropping.

The soils in this unit make up 3 percent of the county. About three-fourths of the acreage is used for cultivated crops and pasture. The rest is in forest.

CAPABILITY UNIT IIe–3

This unit consists of deep, gently sloping soils on the uplands. These soils have a surface layer of very friable loamy sand or sandy loam. Their subsoil is firm, slightly cemented sandy clay loam to clay. Some of the areas are slightly or moderately eroded.

The soils in this unit are very low to medium in natural fertility, medium or low in available water capacity, and very strongly acid. Their organic-matter content is low or very low. They are hard when dry and boggy when wet. Water enters these soils readily but moves slowly or moderately slowly through the profile. Seepage areas are common. The plow layer clods and crusts easily if it is worked when either too dry or too wet. The effective root zone is moderately deep or deep. Crops respond well to fertilizer and lime.

These soils are fairly well suited to most of the crops grown in the county. The main crops are cotton, corn, soybeans, tobacco, and small grain. Sericea lespedeza, Coastal bermudagrass, fescue, and bahiagrass are fairly well suited pasture plants. An example of a suitable cropping system is 2 years of row crops and 2 years of close-growing crops. Another example of a suitable cropping system is 1 year of row crops and 1 year of close-growing crops.

The soils in this unit make up 3 percent of the county. About three-fourths of the acreage is wooded. The rest is used for cultivated crops and pasture. If these soils are cultivated, runoff is moderate and there is a moderate erosion hazard. Seepage and low fertility, though minor limitations, should be taken into consideration in planning management.

CAPABILITY UNIT IIw–1

This unit consists of deep, moderately well drained, nearly level soils on uplands. These soils have a surface layer of very friable loamy sand or sandy loam. Their subsoil is friable or firm sandy loam to sandy clay.

The soils in this unit are low or medium in natural fertility, medium in available water capacity, and strongly acid or very strongly acid. Their organic-matter content is low. Water penetrates readily but moves through these soils at a moderate or moderately slow rate. Crops respond well to fertilizer and lime.

These soils are well suited to all of the crops grown in the county. The main crops are cotton, corn, tobacco, soybeans, small grain, and cantaloups. Pasture plants and pecans are also suited. Row crops can be grown year after year. All crop residue should be returned to the soil.

There are no serious hazards in intensive use of these soils for crops. A moderately high water table, however, is a limitation that should be considered when planning management. Drainage is needed in most places for such specialized crops as tobacco. Tile or open ditches can be installed at fairly wide intervals or in a random pattern to drain the wettest spots.

The soils in this unit make up 2.5 percent of the county. About three-fourths of the acreage is used for cultivated crops and pasture. The rest is wooded.

CAPABILITY UNIT IIw–2

This unit consists of somewhat poorly drained, nearly level soils on uplands and stream terraces. These soils have a surface layer of very friable fine sandy loam to loamy sand. Their subsoil is friable or firm sandy loam to sandy clay.

The soils in this unit are low or medium in natural fertility, medium in available water capacity, and very strongly acid. Their organic-matter content is medium. Water penetrates readily but moves through these soils at a moderate or moderately slow rate. Surface runoff is slow to ponded. Crops respond well to fertilizer and lime.

These soils are well suited to most of the crops grown in the county. The main crops are cotton, corn, soybeans, small grain, and tobacco. Ladino clover and fescue are suited also. Row crops can be grown year after year. All crop residue should be returned to the soil.

Wetness is a moderate hazard. Artificial drainage is needed for most crops. Either open ditches or a tile drainage system is adequate.

The soils in this unit make up 5 percent of the county. About two-thirds of the acreage is used for cultivated crops and pasture. The rest is wooded.

CAPABILITY UNIT IIs–1

This unit consists of well-drained or somewhat excessively drained, nearly level or gently sloping soils on uplands and stream terraces. These soils have a surface layer of sand or loamy sand. Their subsoil is friable or firm sandy loam to sandy clay.

The soils in this unit are low or very low in natural fertility, medium or low in available water capacity, and strongly acid or very strongly acid. Their organic-matter content is low or very low. Water penetrates readily but moves through these soils at a moderately slow to moderately rapid rate. The plow layer is easy to keep in good tilth. Crops respond well to fertilizer and lime.

These soils are fairly well suited to most of the crops grown in the county. The main crops are cotton, tobacco, corn, soybeans, small grain, sericea lespedeza, and Coastal bermudagrass. Peaches and pecans are suited also. An example of a suitable cropping system is 1 year of row crops and 1 year of small grain with fescue or hairy indigo. Another example is 2 years of row crops and 2 or more years of sericea lespedeza or lovegrass.

If these soils are cultivated, droughtiness is a moderate hazard. In large fields alternating strips of close-growing crops and clean-tilled crops can be planted at right angles to prevailing winds to help control wind erosion. Low fertility, leaching of plant nutrients, and erosion are limitations that should be considered when planning management.

The soils in this unit make up 7 percent of the county. About three-fourths of the acreage is used for cultivated crops and pasture. The rest is wooded.

CAPABILITY UNIT IIIe–1

This unit consists of moderately eroded, well-drained, sloping soils on uplands. These soils have a surface layer of very friable loamy sand and a subsoil of friable sandy loam to sandy clay. In many places the plow layer is a mixture of the original surface layer and part of the subsoil. Included in these areas are a few severely eroded spots.

The soils in this unit are low or medium in natural fertility, medium in available water capacity, and strongly acid or very strongly acid. Their organic-matter content is low. Surface runoff is rapid if the soils are bare. Water moves through these soils at a moderate rate. The plow layer is easy to keep in good tilth, except in the severely eroded spots. Response to fertilizer and lime is good.

These soils are fairly well suited to all of the crops grown in the county, but if they are cultivated, there is a severe hazard of water erosion. The main crops are cotton, corn, soybeans, small grain, sericea lespedeza, fescue, and Coastal bermudagrass. Peaches and pecans are suited also. An example of a suitable cropping system is 2 years of row crops and 2 years of perennial grasses and legumes. Another example is 1 year of row crops and 2 or more years of perennial grasses and legumes.

The soils in this unit make up less than 1 percent of the county. About three-fourths of the acreage is wooded. The rest is in cultivation.

CAPABILITY UNIT IIIe–2

This unit consists of gently sloping or sloping soils on uplands. These soils are slightly or moderately eroded. They have a surface layer of very friable loamy sand to sandy loam and a subsoil of firm, slightly cemented sandy clay loam to clay. In places the plow layer is a mixture of the original surface layer and part of the subsoil. Included in these areas are a few severely eroded spots.

The soils in this unit are medium to very low in natural fertility, medium or low in available water capacity, and very strongly acid. Their organic-matter content is low or very low. They are hard when dry and boggy when wet. Surface runoff is rapid. Water penetrates at a moderate rate, but it moves through these soils moderately slowly or slowly because the firm, cemented subsoil restricts its movement. Seepage areas are common. The plow layer clods and crusts easily if it is worked when either too dry or too wet. Crops respond well to fertilizer and lime.

These soils are fairly well suited to most of the crops grown in the county. The main crops are cotton, corn, soybeans, and small grain. Sericea lespedeza, Coastal bermudagrass, fescue, and bahiagrass are suited also. An example of a suitable cropping system is 2 years of row crops and 2 years of close-growing crops. Another example is 1 year of row crops and 2 or more years of close-growing crops.

The rapid runoff causes a severe hazard of erosion if these soils are cultivated. In seepage areas spot drainage is needed for specialized crops. Low fertility, the slope, and the compact, slowly permeable subsoil are limitations to be taken into consideration in planning management.

The soils in this unit make up 2.5 percent of the county. Most of the acreage is wooded. A small acreage is used for cultivated crops and pasture.

CAPABILITY UNIT IIIe-3

This unit consists of well-drained, sloping soils on uplands. These soils have a sandy surface layer 20 to 30 inches thick. Their subsoil is friable or firm sandy loam to sandy clay.

The soils in this unit are low or very low in natural fertility, low in available water capacity, and strongly acid or very strongly acid. Their organic-matter content is low or very low. Surface runoff is medium or rapid. Water penetrates readily and moves through these soils at a moderate or moderately slow rate. The plow layer is easy to keep in good tilth. Crops respond well to fertilizer and lime.

These soils are fairly well suited to most of the crops grown in the county. The main crops are cotton, corn, tobacco, small grain, and soybeans. Sericea lespedeza, Coastal bermudagrass, bahiagrass, peaches, and pecans are fairly well suited also. An example of a suitable cropping system is 1 year of row crops and 1 or more years of close-growing crops. Another example is 2 years of row crops and 2 or more years of close-growing crops. Perennials suited to sandy soils are suitable close-growing crops.

If these soils are cultivated, there is a severe hazard of water erosion. Low fertility, leaching of plant nutrients, droughtiness, the slope, and the hazard of wind erosion should be taken into consideration in planning management.

The soils in this unit make up 1 percent of the county. About half of the acreage is used for cultivated crops and pasture. The rest is wooded.

CAPABILITY UNIT IIIw-1

This unit consists of moderately well drained, nearly level loamy sands on uplands and stream terraces. The sandy material is 40 inches or more thick and is very friable or loose.

These soils are very low in natural fertility, low in available water capacity, and strongly acid. They are medium or low in organic-matter content. Water moves through these soils at a rapid rate. Crops respond well to fertilizer and lime.

These soils are fairly well suited to most of the crops grown in the county. The main crops are cotton, corn, small grain, and soybeans. Pasture crops are also suited. An example of a suitable cropping system is 1 or 2 years of row crops and 1 or more years of small grain or hairy indigo.

Wetness is a severe hazard. Artificial drainage is needed for most crops. Low fertility and leaching of plant nutrients are other limitations to be taken into consideration in planning management.

The soils in this unit make up less than 1 percent of the county. Three-fourths of the acreage is wooded. The rest is used for cultivated crops and pasture.

CAPABILITY UNIT IIIw-2

This unit consists of nearly level, somewhat poorly drained or poorly drained soils on uplands. These soils occur mainly in Carolina bays. They have a surface layer of gray to very dark gray, very friable loam. Their subsoil is gray, firm or very firm sandy clay to clay mottled with strong brown and red.

These soils are medium in natural fertility and available water capacity and are very strongly acid. Their organic-matter content is medium. Water penetrates at a moderate or moderately slow rate and moves slowly through these soils. Surface runoff is slow to ponded.

Figure 6.—**A drainage system is needed to make the soils in capability unit IIIw-2 suitable for crops. This canal serves as an outlet for underground tile drainage in an area of McColl loam in a Carolina bay near Laurinburg.**

Without artificial drainage, water stands on these soils for long periods. A complete system of surface and underground drains is needed for crops and pasture. Either tile or open ditches can be used (fig. 6). If these soils are drained, they are suited to a limited number of crops, such as corn, soybeans, annual lespedeza, Ladino clover, and fescue. Much of the acreage is used for cotton. Crops respond well to fertilizer and lime. An example of a suitable cropping system is 1 year of row crops and 2 or more years of small grain and grasses or legumes.

If these soils are used for crops and pasture, the hazard of wetness is severe. The slowly permeable subsoil and the lack of natural drainage outlets are limitations that should be taken into consideration when planning management.

The soils in this unit make up 6.5 percent of the county. About three-fourths of the acreage is wooded. The rest is used for cultivated crops and pasture.

CAPABILITY UNIT IIIw-3

This unit consists of poorly drained or very poorly drained soils on uplands and stream terraces. These soils have a surface layer of dark-gray to black, very friable fine sandy loam or loam. Their subsoil is light-gray to dark-gray, friable or firm sandy loam to sandy clay.

These soils are low in natural fertility, medium in available water capacity, and very strongly acid. Their organic-matter content is medium or high. Water penetrates at a moderate rate and moves through these soils at a moderate or moderately slow rate. Surface runoff is slow to ponded.

Without artificial drainage, water stands on these soils for long periods, and a drainage system is needed for crops and pasture. Either tile or open ditches can be used. If these soils are drained, they are suited to a limited number of crops, such as corn, soybeans, annual lespedeza, Ladino clover, and fescue. Some of the acreage is used for cotton. Crops respond well to fertilizer and lime. Row crops can be grown year after year if all crop residue is returned to the soil.

If these soils are used for crops and pasture, wetness is a severe limitation. Drainage outlets are lacking in many places.

The soils in this unit make up 4 percent of the county. About three-fourths of the acreage is wooded. The rest is used for cultivated crops and pasture.

CAPABILITY UNIT IIIs–1

This unit consists of deep, nearly level or gently sloping, somewhat excessively drained sands on uplands and stream terraces. These soils have a surface layer of gray to dark grayish-brown, very friable or loose sand 30 inches or more thick. Their subsoil is pale yellow to yellowish red.

The soils in this unit are very low in natural fertility, low or very low in available water capacity, and strongly acid or very strongly acid. Their organic-matter content is very low. Water penetrates readily and moves rapidly through these soils. The plow layer is easy to keep in good tilth and can be worked throughout a wide range of moisture content. Crops respond well to fertilizer and lime.

The soils in this unit are fairly well suited to most of the crops grown in the county. The main crops are cotton, corn, tobacco, melons, small grain, sericea lespedeza, and Coastal bermudagrass. Bahiagrass and peaches are fairly well suited also. A cropping system that supplies a large amount of long-lasting crop residue should be used, because the organic matter in these soils is quickly used up. An example of a suitable cropping system is 1 year of row crops and 1 year of small grain with hairy indigo or lovegrass.

If these soils are cultivated, droughtiness is a severe hazard. The damage from wind erosion can be reduced by leaving all crop residue near the surface. Very low fertility, leaching of plant nutrients, and wind erosion are limitations that should be taken into consideration when planning management.

The soils in this unit make up 11 percent of the county. About half of the acreage is used for crops and pasture. The rest is wooded.

CAPABILITY UNIT IVe–1

This unit consists of moderately deep, sloping or strongly sloping soils on the uplands. These soils are slightly or moderately eroded. They have a surface layer of very friable loamy sand and a subsoil of firm, slightly cemented sandy clay loam to sandy clay. In many places the plow layer is a mixture of the original surface layer and part of the subsoil. Included in these areas are a few severely eroded spots.

The soils in this unit are low or very low in natural fertility, medium or low in available water capacity, and very strongly acid. Their organic-matter content is low or very low. Surface runoff is rapid. The firm, slightly cemented subsoil restricts the penetration of water and roots. The plow layer clods and crusts readily if it is worked when too dry or too wet. Response to fertilizer and lime is good.

These soils are fairly well suited to most of the crops grown in the county. The main crops are cotton, corn, soybeans, and small grain. Sericea lespedeza, fescue, Coastal bermudagrass, and bahiagrass are suitable pasture plants. An example of a suitable cropping system is 1 year of row crops and 3 or more years of perennial grasses or legumes.

If these soils are cultivated, there is a very severe hazard of water erosion. Stripcropping and the use of grassed waterways help to control erosion. Low fertility, slope, and a compact, slowly permeable subsoil should be taken into consideration when planning management.

The soils in this unit make up 1 percent of the county. About three-fourths of the acreage is wooded. The rest is used for cultivated crops and pasture.

CAPABILITY UNIT IVw–1

This unit consists of poorly drained or very poorly drained, nearly level loamy sands on uplands and stream terraces, and loamy soils that formed in local alluvium. The sandy soils are very friable or loose.

These soils are very low or low in natural fertility, medium or low in available water capacity, and very strongly acid. Their organic-matter content is medium or high. Water moves through these soils rapidly. Crops respond well to fertilizer and lime.

If these soils are drained, they are fairly well suited to a limited number of crops, such as corn, soybeans, small grain, fescue, and annual lespedeza. An example of a suitable cropping system is 1 year of row crops and 1 or more years of small grain with fescue.

In undrained areas the water table is at or near the surface, and water stands for long periods. A complete drainage system is needed for both cultivated crops and pasture. Both tile and open ditches are suitable.

Wetness is a very severe limitation. Low fertility, leaching of plant nutrients, and the loose, sandy subsoil should be taken into consideration when planning management.

The soils in this unit make up 4 percent of the county. Most of the acreage is wooded. A small part of the acreage is used for crops and pasture.

CAPABILITY UNIT IVw–4

This unit consists of poorly drained or very poorly drained soils on first bottoms and stream terraces. These soils have a surface layer of very friable, dark-gray to black loamy sand to mucky loam. Their subsoil is light-gray to very dark gray fine sandy loam to sandy clay loam.

These soils are low in natural fertility, medium in available water capacity, and very strongly acid. Their organic-matter content is medium or high. Surface runoff is slow to ponded.

These soils are subject to flooding, and water stands on the surface for long periods. If drained, they are well suited to a limited number of crops, such as corn, soybeans, annual lespedeza, Ladino clover, and fescue. Crops respond well to fertilizer and lime, but a complete drainage system is needed for either cultivated crops or pasture.

Wetness is a very severe limitation. Dikes are needed in some areas, but open ditches are used for drainage in most places. A high water table and the lack of drainage outlets are other limitations that should be taken into consideration when planning management.

The soils in this unit make up 2 percent of the county. Most of the acreage is wooded. A small part is used for cultivated crops and pasture.

CAPABILITY UNIT IVs–1

This unit consists of deep, nearly level to sloping, somewhat excessively drained sands on uplands and stream terraces. These soils have a surface layer of gray to dark grayish-brown, very friable or loose sand 30 inches or more thick. Their subsoil is brownish yellow to yellowish red.

The soils in this unit are very low in natural fertility, low or very low in available water capacity, and strongly acid or very strongly acid. Their organic-matter content is very low. Water penetrates readily and moves rapidly through these soils. The plow layer is easy to keep in good tilth and can be worked throughout a wide range of moisture content. Crops respond well to fertilizer and lime.

The soils in this unit are fairly well suited to many of the crops grown in the county. The main crops are cotton, corn, tobacco, melons, and sericea lespedeza. Bahiagrass and Coastal bermudagrass are also fairly well suited. A cropping system that supplies a large amount of long-lasting crop residue should be used because the organic matter in these soils is quickly used up. An example of a suitable cropping system is 1 year of row crops and 2 or more years of sericea lespedeza, bahiagrass, Coastal bermudagrass, or lovegrass.

If these soils are cultivated, droughtiness is a very severe hazard. Alternate strips of close-growing crops and clean-tilled crops, at right angles to the prevailing winds, provide some protection against wind erosion. Leaching of plant nutrients, very low fertility, and wind erosion are limitations that should be taken into consideration when planning management.

The soils in this unit make up 25 percent of the county. About three-fourths of the acreage is wooded. The rest is used for cultivated crops and pasture.

CAPABILITY UNIT Vw–1

This unit consists of a nearly level, poorly drained sandy soil, and wet areas of alluvial land. The sandy soil is on low uplands and stream terraces. It has a gray to very dark gray surface layer 40 inches or more in thickness and is loose to very friable. The alluvial land consists of mixed sediments on flood plains.

These soils are very low in natural fertility and very strongly acid. They are medium or high in organic-matter content. Water stands on the surface for long periods. The areas of alluvial land are flooded frequently each year.

The hazard of water damage is very severe. These soils are not suitable for cultivation, because of frequent flooding, a very high water table, poor drainage outlets, and low fertility. Some of the areas can be cleared, partly drained, and used for pasture.

The soils in this unit make up 1 percent of the county. All of the acreage is wooded.

CAPABILITY UNIT VIe–1

This unit consists of sloping or moderately steep soils on uplands. Most of the areas are slightly or moderately eroded, but a few are severely eroded. These soils have a surface layer of very friable loamy sand and a subsoil of firm or very firm, slightly cemented sandy clay loam to clay. In cleared areas the plow layer is a mixture of the original surface layer and part of the subsoil.

The soils in this unit are very low in natural fertility, low in available water capacity, and very strongly acid. Their organic-matter content is low or very low. Surface runoff is rapid. The firm, slightly cemented subsoil restricts the penetration of water and roots. Response to fertilizer and lime is good.

These soils are not suited to cultivated crops. Their use is limited by the erosion hazard, steepness, rapid runoff, low fertility, and a compact subsoil. They are fairly well suited to a few perennial grasses and legumes for hay or pasture. Sericea lespedeza, Coastal bermudagrass, fescue, and bahiagrass are fairly well suited.

The soils in this unit make up less than 1 percent of the county. Most of the acreage is wooded. A small acreage is used for pasture.

CAPABILITY UNIT VIIw–1

This unit consists of frequently flooded swampland on first bottoms of the larger streams. The soil material is variable in texture, color, and consistence. Water stands on the surface much of the time.

This unit makes up 4 percent of the county. All of the acreage is in low-quality native hardwoods, such as blackgum, tupelo, sweetgum, and cypress.

CAPABILITY UNIT VIIs–1

This unit consists of deep, strongly sloping or steep, somewhat excessively drained sands and a few areas of light-gray to white, gently sloping, excessively drained sand.

The soils in this unit are very low in natural fertility and available water capacity and are strongly acid or very strongly acid. Their organic-matter content is very low. Water penetrates readily and moves rapidly through these soils.

The soils in this unit are not suited to cultivated crops. Their use is limited by steepness, very low fertility, very severe leaching of plant nutrients, droughtiness, and the hazard of wind and water erosion. They are suited to a few perennial grasses and legumes, including sericea lespedeza, Coastal bermudagrass, and bahiagrass.

Estimated yields

Table 2 gives estimates of yields of the principal crops grown in Scotland County. Yields depend upon a combination of soil and climate, the kind of crop, and the level of management. The estimates in table 2 are based on high-level management. Yields are substantially lower under less intensive management.

Practices generally considered necessary to obtain the yields given in the table are—

1. Fertilizer and lime are added according to the needs indicated by soil tests.
2. High-yielding varieties of crops are grown.
3. Legumes are inoculated.
4. The soils are properly tilled, and the crops are properly cultivated.
5. Weeds, insects, and diseases are controlled.
6. Crops are grown in conservation rotations.
7. Runoff is adequately controlled.
8. Overgrazing is avoided, and pasture is well managed.

TABLE 2.—*Estimated average yields per acre of important crops under high-level management*

[Dashed lines indicate that the crop is not commonly grown on the soil or that data on which to base an estimate are not available.]

Symbol	Soil	Corn	Cotton (lint)	Tobacco (flue cured)	Soybeans	Oats	Wheat	Hay		Pasture	
								Sericea lespedeza	Coastal bermudagrass	Fescue-Ladino	Coastal bermudagrass
		Bu.	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Animal-unit-days* [1]	*Animal-unit-days* [1]
Al	Alluvial land, wet										
Ba	Bibb soils, local alluvium	50			35	60				190	
BnB	Blaney sand, 0 to 6 percent slopes	55	475	1,600	25	50	25	2.0	3.6		250
BnC	Blaney sand, 6 to 10 percent slopes	40	400	1,450	20	40	22	1.7	3.0		225
Ch	Chipley loamy sand	55	475	1,850	25	50	28	2.0	3.7		300
Co	Coxville loam	70	500		35	70	30			225	
CrB2	Craven sandy loam, 2 to 6 percent slopes, eroded	55	550	1,900	30	65	30	2.0	3.0	175	250
CrC2	Craven sandy loam, 6 to 10 percent slopes, eroded	45	400	1,700	25	50	23	2.0	3.0	165	225
Db	Dunbar fine sandy loam	90	700	2,450	40	70	40	2.5	4.5	230	400
Dp	Duplin sandy loam	90	750	2,400	40	75	40	2.7	4.5	215	400
EuB	Eustis sand, 0 to 6 percent slopes	45	325	1,400	20	36	20	2.0	2.5		190
EuC	Eustis sand, 6 to 10 percent slopes	35	275	1,300	18	30	17	1.8	2.7		160
FaA	Faceville loamy sand, 0 to 2 percent slopes	90	950	2,450	40	85	40	3.0	5.5	210	350
FaB	Faceville loamy sand, 2 to 6 percent slopes	85	875	2,200	35	80	35	2.6	5.0	200	330
FaB2	Faceville loamy sand, 2 to 6 percent slopes, eroded	70	750	2,000	30	70	30	2.4	4.6	180	300
FaC2	Faceville loamy sand, 6 to 10 percent slopes, eroded	65	600	1,800	25	55	28	2.0	4.0	170	280
GdA	Gilead loamy sand, 0 to 2 percent slopes	65	600	2,100	30	60	30	2.2	3.6	175	250
GdB	Gilead loamy sand, 2 to 6 percent slopes	60	550	2,000	30	55	28	2.2	3.4	170	250
GdB2	Gilead loamy sand, 2 to 6 percent slopes, eroded	55	500	1,800	28	50	25	1.8	3.0	150	225
GdC	Gilead loamy sand, 6 to 10 percent slopes	50	450	1,700	25	45	22	1.7	2.8	140	215
GdC2	Gilead loamy sand, 6 to 10 percent slopes, eroded	45	400	1,500	20	40	20	1.6	2.6	135	200
GdD	Gilead loamy sand, 10 to 15 percent slopes							1.5	2.6	130	200
GoA	Goldsboro loamy sand, 0 to 2 percent slopes	80	675	2,400	40	65	40	2.5	5.0	175	300
HfC2	Hoffman loamy sand, 6 to 10 percent slopes, eroded							1.0	1.7		150
HfD	Hoffman loamy sand, 10 to 20 percent slopes								1.5		100
Jo	Johns loamy sand	80	650	2,200	40	70	35	2.0	3.8	170	290
Jm	Johnston mucky loam										
KaA	Kalmia loamy sand, 0 to 2 percent slopes	80	800	2,300	40	70	38	3.0	6.0	200	360
KnA	Kenansville loamy sand, 0 to 2 percent slopes	60	525	2,000	26	55	30	2.7	4.0		275
KnB	Kenansville loamy sand, 2 to 6 percent slopes	55	475	1,800	23	50	28	2.5	3.8		260
LkB	Lakeland sand, 0 to 10 percent slopes	40	325	1,200				2.0	2.8		190
LkD	Lakeland sand, 10 to 20 percent slopes							1.4	2.0		140
Lu	Lumbee loamy sand	50			35	60	30			190	
Ly	Lynchburg loamy sand	85	650	2,350	40	75	35	2.0	3.8	190	325
Ma	Mantachie soils, local alluvium	75			40	60				190	290
MbA	Marlboro loamy sand, 0 to 2 percent slopes	90	950	2,400	40	85	40	3.0	5.0	210	350
MbB	Marlboro loamy sand, 2 to 6 percent slopes	85	875	2,200	35	80	35	2.6	5.0	200	330
MbB2	Marlboro loamy sand, 2 to 6 percent slopes, eroded	70	750	2,000	30	70	30	2.4	4.6	180	300
Mc	McColl loam	75	625		40	75	35			235	
MxA	Maxton loamy sand, 0 to 2 percent slopes	75	700	2,400	40	70	35	2.5	5.0	200	360
NoA	Norfolk loamy sand, 0 to 2 percent slopes	80	825	2,500	40	70	40	3.2	6.0	200	360
NoB	Norfolk loamy sand, 2 to 6 percent slopes	75	750	2,400	35	65	38	3.0	5.0	190	350
NoB2	Norfolk loamy sand, 2 to 6 percent slopes, eroded	70	650	2,000	30	60	35	3.0	4.5	180	340
NoC2	Norfolk loamy sand, 6 to 10 percent slopes, eroded	65	500		25	55	30	2.7	4.0	170	310
Oc	Ocilla loamy sand	70	550	2,000	35	65	30	2.0	3.7	175	300
Ok	Okenee loam	70			35	60				200	
OrA	Orangeburg loamy sand, 0 to 2 percent slopes	85	850	2,500	40	75	45	3.2	6.0	225	360
OrB	Orangeburg loamy sand, 2 to 6 percent slopes	75	750	2,400	35	70	40	3.0	5.0	200	350
OrB2	Orangeburg loamy sand, 2 to 6 percent slopes, eroded	70	700	2,000	30	60	35	3.0	4.5	180	340

See footnote at end of table.

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

Symbol	Soil	Corn	Cotton (lint)	Tobacco (flue cured)	Soybeans	Oats	Wheat	Hay		Pasture	
								Sericea lespedeza	Coastal bermudagrass	Fescue-Ladino	Coastal bermudagrass
		Bu.	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Animal-unit-days* [1]	*Animal-unit-days* [1]
OrC2	Orangeburg loamy sand, 6 to 10 percent slopes, eroded	65	500	------	25	55	30	2. 7	4. 0	170	310
Pl	Plummer loamy sand	45	------	------	25	50	------	--------	--------	130	--------
Ps	Plummer sand	------	------	------	------	------	------	--------	--------	125	--------
Pt	Portsmouth loam	70	------	------	35	60	------	--------	--------	250	--------
Ra	Rains fine sandy loam	80	500	------	35	65	------	--------	--------	200	--------
Ru	Rutlege loamy sand	45	------	------	25	50	------	--------	--------	130	--------
Sl	St. Lucie sand	------	------	------	------	------	------	--------	--------	--------	--------
Sm	Smoothed sandy land	------	------	------	------	------	------	--------	--------	--------	--------
Sw	Swamp	------	------	------	------	------	------	--------	--------	--------	--------
VaB	Vaucluse loamy sand, 2 to 6 percent slopes	45	425	1, 400	20	42	------	2. 2	3. 4	165	225
VaB2	Vaucluse loamy sand, 2 to 6 percent slopes, eroded	45	400	1, 300	20	38	------	2. 2	3. 4	165	225
VaC	Vaucluse loamy sand, 6 to 10 percent slopes	40	375	------	------	------	------	1. 7	2. 8	140	215
VaC2	Vaucluse loamy sand, 6 to 10 percent slopes, eroded	------	------	------	------	------	------	1. 6	2. 6	135	200
VaD	Vaucluse loamy sand, 10 to 15 percent slopes	------	------	------	------	------	------	1. 5	2. 6	130	200
VaD2	Vaucluse loamy sand, 10 to 15 percent slopes, eroded	------	------	------	------	------	------	1. 4	2. 5	125	190
WaA	Wagram loamy sand, 0 to 2 percent slopes	65	600	2, 100	27	55	30	3. 0	5. 0	--------	300
WaB	Wagram loamy sand, 2 to 6 percent slopes	60	550	1, 900	24	55	28	2. 8	4. 8	--------	285
WaC	Wagram loamy sand, 6 to 10 percent slopes	55	500	1, 700	20	45	25	2. 6	4. 6	--------	275
WsB	Wagram sand, thick surface, 0 to 6 percent slopes	45	375	1, 500	20	40	------	2. 1	3. 0	--------	215
WsC	Wagram sand, thick surface, 6 to 10 percent slopes	40	350	1, 300	18	35	------	1. 8	2. 5	--------	200
WsD	Wagram sand, thick surface, 10 to 15 percent slopes	------	------	------	------	------	------	1. 6	2. 3	--------	165

[1] The number of days per year that 1 acre will support one animal unit without injury to the pasture. An animal unit is one cow one steer, or one horse; five hogs; or seven sheep or goats.

The estimates given in the table are based on experience with the soils and crops of the county; on yield data from experienced farmers; and on yield data from test plots in the county. All are based on assumptions of average rainfall over a long period of time, no supplemental irrigation, adequate drainage, and no flooding or ponding.

Use of the Soils for Woodland [3]

All of the land area that is now Scotland County was originally covered with forest. Longleaf pine was the principal tree species in the Sandhills region and on the ridges and knolls of the Upper Coastal Plain. Longleaf pine, white oak, red oak, hickory, yellow-poplar, dogwood, and American holly grew on the well-drained soils of the Upper Coastal Plain. Loblolly pine and some longleaf pine competed with sweetgum, blackgum, water oak, willow oak, white oak, and red maple on the poorly drained soils of the Upper Coastal Plain. Sweetgum, blackgum, yellow-poplar, white oak, red oak, ash, elm, sycamore, and loblolly pine grew in the better drained parts of the flood plains along the major streams. Cypress and pond pine competed with a profuse growth of wet-site, broad-leaved trees and shrubs in the Carolina bays, and loblolly and longleaf pine grew around the edges of the bays. Baldcypress and swamp tupelo were the principal species in the swamps.

In 1962 nearly 53 percent of the land area, or 106,800 acres, was used for commercial forest (*6*).[4] Approximately 75 percent of this acreage was privately owned, and the rest was in public ownership. Farmers owned about 45.3 percent, forest industries about 3.4 percent, and other private landowners 26.8 percent of the commercial forest land. Many of the privately owned tracts were less than 100 acres in size.

Since World War II many farmers and other landowners have improved their woodlands by planting trees, by properly thinning and harvesting the stands, and by applying other good management practices. Most of the open land allocated to forest use has now been planted. Areas now in scrub oak and other undesirable vegetation could be converted to commercially valuable forest if the undesirable trees were uprooted by heavy machinery and the sites were planted to slash pine, loblolly pine, and longleaf pine.

[3] By JOHN E. WIGGINS, JR., forester, Soil Conservation Service, and FRED A. MOEHLER, service forester, North Carolina Division of Forestry.

[4] Italic figures in parentheses refer to Literature Cited, p. 69.

Major forest types

The four principal forest types, as classified by the Society of American Foresters (*4*), that make up the present woodland are longleaf pine, longleaf pine-scrub oak, loblolly pine, and loblolly pine-hardwoods. Two other types, of minor importance, are sweetgum-yellow-poplar and baldcypress-water tupelo. Each type is briefly described in the following paragraphs.

Longleaf pine.—This forest type consists of pure stands of longleaf pine or stands where longleaf pine is predominant. Turkey oak, bluejack oak, blackjack oak, and sand post oak are common associates on the well-drained or excessively drained sands or loamy sands. Loblolly pine, sweetgum, yellow-poplar, southern red oak, and white oak are common associates on the more poorly drained soils. This forest type occurs in the Sandhills and on the Upper Coastal Plain. After cutting or repeated burning, it is usually succeeded by mixed stands of longleaf pine, oak, and hickory, and eventually by hardwoods.

Longleaf pine-scrub oak.—This forest type consists of longleaf pine and scrub trees, such as turkey, bluejack, blackjack, and sand post oaks (fig. 7). It grows mainly in the Sandhills at elevations of 240 to 450 feet. This type occupies dry, sandy ridges and upper slopes and large areas of well-drained or excessively drained coarse sands, such as those of the Lakeland and Eustis series. This forest type usually succeeds longleaf pine after cutting and repeated burning.

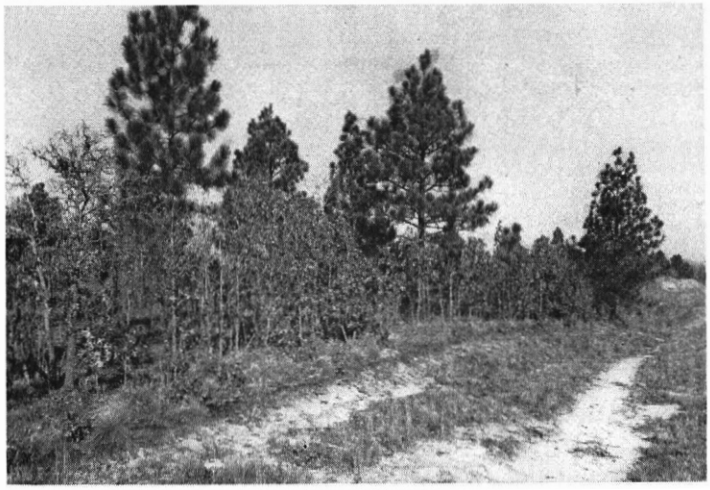

Figure 7.—**Typical vegetation of the longleaf pine-scrub oak forest type. Turkey and other scrub oaks have encroached on the site and compete severely with pine. The scrub oaks must be controlled before reforesting to adapted species of pine. The soil is a gently sloping area of Lakeland sand. It is in woodland group 12.**

Loblolly pine.—This forest type consists of pure stands of loblolly pine or stands where loblolly pine is predominant. Southern red oak, white oak, post oak, yellow-poplar, sweetgum, blackgum, longleaf pine, American holly, persimmon, dogwood, and sourwood are common associates on the better drained soils. Pond pine, sweetgum, blackgum, water oak, willow oak, red maple, and sweetbay are common associates on the poorly drained soils. This forest type occurs on broad, nearly level uplands and in poorly drained depressions on the Upper Coastal Plain. It also grows in abandoned fields and cutover or burned areas. Loblolly pine is a very aggressive species. It takes over old fields and heavily cutover or severely burned areas. After cutting, this forest type is succeeded by the loblolly pine-hardwoods type.

Loblolly pine-hardwoods.—This forest type consists of stands in which loblolly pine, though not predominant, is the key species and makes up at least 25 percent of the stand. The loblolly pine is associated with a wide variety of wet-site hardwoods and with pond pine and longleaf pine. The hardwoods include sweetgum, blackgum, yellow-poplar, elm, sourwood, ash, American holly, water oak, willow oak, red maple, sweetbay, and redbay. On the drier sites, loblolly pine is commonly associated with southern red oak, white oak, post oak, hickory, dogwood, persimmon, and longleaf pine. This forest type grows in the southeastern part of the county along the smaller streams and branches, and on the broad, nearly level uplands of the Coastal Plain. It is a transitional type between loblolly pine and hardwoods.

Sweetgum-yellow-poplar.—Sweetgum and yellow-poplar predominate in this forest type. Other species commonly associated include loblolly pine, a little Atlantic white-cedar, and such moist-site hardwoods as blackgum, white ash, green ash, red maple, sweetbay, and elm. This forest type grows on moist lower slopes and alluvial first bottoms, generally in strips between streams or swamps and upper slopes. Its acreage is relatively small.

Baldcypress-water tupelo.—In this forest type, the predominant species are baldcypress, water tupelo, and swamp tupelo. Swamp tupelo is more common than water tupelo because Scotland County is just west of the range of water tupelo in this region. Associated species include swamp cottonwood, red maple, and Carolina ash. This forest type occurs in swamps and on low, very poorly drained flats of the Coastal Plain where water stands most of the year. After cutting, this type reverts to tupelo, and only small, scattered stands of baldcypress are left. Pondcypress, a variety of baldcypress, is predominant in many shallow ponds, especially in those underlain by fine sand (*2*).

Woodland groups

The soils of Scotland County have been placed in woodland groups to assist landowners in planning the use of their soils and management of their woodlands. Each group is made up of soils that are about the same in available water capacity and other major characteristics that affect the growth of trees. The soils within each group are subject to similar hazards and have similar limitations that affect the planting, tending, and harvesting of trees. All the soils in each group, therefore, have about the same potential productivity for trees and need about the same management and conservation practices.

In table 3 the groups are listed and a brief description of the soils in each group is given. The site index of commercially important trees (figures 8 and 9) is given for the soils of each series mapped in this county. Site index is the average total height, in feet, that the dominant and codominant trees growing on a specified soil will reach at 50 years of age. It is a means of expressing the potential productivity of the soil for a given kind of tree. The site indexes are based on studies made of soils throughout the Southern Coastal Plain and the Carolina and Georgia

Sandhills Major Land Resource Area. The mean precipitation during the frost-free period is 30 to 40 inches in this area.

The table also gives ratings of the hazards and limitations that affect management of the soils of each woodland group, and it lists species of trees suitable for planting. The ratings of the soils with respect to plant competition, seedling mortality, equipment limitations, erosion hazard, and windthrow hazard are discussed in the following paragraphs.

PLANT COMPETITION.—Undesirable trees, shrubs, vines, grasses, and other plants may invade a site when openings are made in the canopy by cutting, fire, grazing, or other disturbance. The invading plants compete with desirable trees for water, nutrients, and sunlight and hinder or prevent their establishment and growth. A rating of *slight* indicates that competition from such plants presents no special problem. A rating of *moderate* means plant competition ordinarily does not prevent establishment of an adequate stand of the desired species. Development of a normal, fully stocked stand may be delayed, however, because establishment of seedlings is more difficult and early growth is slower. A rating of *severe* indicates that competition prevents adequate restocking, either by natural reseeding or by planting, unless the site has had intensive preparation and the management includes weeding and special maintenance practices.

***Figure 9.*—A plantation of slash pine growing on Lakeland sand, 0 to 10 percent slopes, near Gibson. The stand has a high survival rate and is making good growth. It is now 6 years old and will be ready for commercial thinning in a few years. The site index for slash pine on this soil is 78. This soil is in woodland group 12.**

***Figure 8.*—A well-managed stand of longleaf pine growing on Gilead loamy sand, 2 to 6 percent slopes, in the Sandhills. The stand is thinned periodically to encourage growth and improve the quality of the trees. The site index for longleaf pine on this soil is 68. This soil is in woodland group 4.**

SEEDLING MORTALITY.—Seedling mortality refers to the expected degree of loss of seedlings. Even if healthy seedlings of a suitable species are correctly planted or occur naturally in adequate numbers, some of them will not survive if characteristics of the soil are unfavorable. A rating of *slight* indicates that ordinarily not more than 25 percent of either planted or naturally occurring seedlings die, and one planting usually produces a satisfactory stand. A rating of *moderate* means that the losses to be expected are between 25 and 50 percent of the stand, and natural regeneration cannot be relied upon for adequate restocking. A rating of *severe* indicates that more than half of the seedlings are likely to die, and special planting techniques and much replanting are necessary to insure adequate stocking.

EQUIPMENT LIMITATIONS.—Such characteristics as soil texture, slope, and drainage may limit or prohibit the use of equipment commonly used in harvesting trees or in other forest management operations. A rating of *slight* indicates that there is no particular problem in the use of equipment, and no restriction on the kind of equipment or on the time of year it is used. A rating of *moderate* means that not all types of equipment can be used, that there are periods when equipment cannot be used because of seasonal wetness, slopes of more than 20 percent, or unfavorable texture and consistence. A rating of *severe* indicates that many kinds of equipment cannot be used, that there is a seasonal restriction of more than 3 months a year, or that the use of equipment injures tree roots and causes serious damage to the structure and stability of the soil.

EROSION HAZARD.—This refers to the potential hazard of erosion when the soils are managed according to accepted standards. Woodland can be protected from

237-682—67——3

TABLE 3.—*Woodland*

[Dashed lines indicate that potential productivity

Woodland group	Soil types	Potential productivity					
		Loblolly pine		Longleaf pine		Slash pine	
		Site index [1]	*No. of plots sampled*	*Site index* [1]	*No. of plots sampled*	*Site index* [1]	*No. of plots sampled*
Group 1: Deep, well-drained soils that have a friable or firm subsoil in which permeability is moderately slow or moderate.	Faceville loamy sand	87	2	70	(2)	87	(2)
	Kalmia loamy sand	91±2	6	70	(2)	90	(2)
	Marlboro loamy sand	86±4	7	70	2	85	(2)
	Maxton loamy sand	91±4	21	74	(2)	90	(2)
	Norfolk loamy sand	87±5	40	73±5	38	88±4	11
	Orangeburg loamy sand	84±4	18	70±4	10	90	1
Group 2: Deep, moderately well drained soils that have a friable or firm subsoil in which permeability is moderately slow or moderate.	Duplin sandy loam	90	(2)	80	(2)	90	(2)
	Goldsboro loamy sand	90±7	15	81±5	27	92±3	13
Group 3: Deep, somewhat poorly drained soils that have a friable or firm subsoil. Permeability is moderate or moderately slow.	Dunbar fine sandy loam	88±3	15	74	3	90	(2)
	Johns loamy sand	90	(2)	70	(2)	90	(2)
	Lynchburg loamy sand	87±5	18	71±4	44	91±5	24
	Mantachie soils, local alluvium	90	(2)	70	(2)	90	(2)
	Ocilla loamy sand	87	(2)	70	(2)	90	(2)
Group 4: Deep, well drained or moderately well drained soils that have a friable or firm, slightly cemented, sticky subsoil in which permeability is moderately slow or slow.	Craven sandy loam	82±3	8	67±2	5	85	(2)
	Gilead loamy sand	81±7	23	68±6	24	84	2
Group 5: Poorly drained or very poorly drained soils that have a friable or firm subsoil in which permeability is moderately slow or moderate. These soils have a high water table.	Bibb soils, local alluvium	95	(2)	75	(2)	95	(2)
	Lumbee loamy sand	94±5	11	71	1	95	(2)
	Okenee loam	98	(2)	68	(2)	94	(2)
	Portsmouth loam	96±5	26	68±5	6	93±5	8
	Rains fine sandy loam	90±8	15	67	3	90±7	31
Group 6: Somewhat poorly drained or poorly drained soils that have a firm or very firm subsoil in which permeability is slow.	Coxville loam	89±1	25	72±2	11	96	2
	McColl loam	87±6	6	69	1	95	(2)
Group 7: Poorly drained or very poorly drained soils on alluvial flood plains, subject to frequent overflow.	Alluvial land, wet	100	(2)	75	(2)	100	(2)
	Johnston mucky loam	106	2	75	(2)	100	(2)
Group 8: Well-drained or somewhat excessively drained soils that have a thick surface layer (20 to 30 inches) and a friable or firm subsoil in which permeability is moderately slow to moderately rapid.	Blaney sand	81±7	23	68±6	24	84	2
	Kenansville loamy sand	85	(2)	70	(2)	85	(2)
	Wagram loamy sand	85	(2)	70	(2)	85	(2)
Group 9: Moderately well drained soils that have a very friable or loose subsoil in which permeability is rapid.	Chipley loamy sand	75±2	16	69±1	36	90±3	7
Group 10: Poorly drained or very poorly drained soils that have a very friable or loose subsoil in which permeability is rapid. These soils have a high water table.	Plummer loamy sand	87±4	11	77±3	17	87±3	29
	Plummer sand	87±4	11	77±3	17	87±3	29
	Rutlege loamy sand	85±2	4	71±1	12	94±2	6
Group 11: Deep, somewhat excessively drained soils that have a rapidly permeable surface layer 30 inches or more thick.	Eustis sand	83±5	15	76±6	32	85	5
	Wagram sand, thick surface	77±5	19	69±9	44	80	(2)

See footnotes at end of table.

groups of soils

has not been or cannot be determined]

Hazards and limitations					Species priority for planting
Plant competition	Seedling mortality	Equipment limitations	Water erosion hazard	Windthrow hazard	
Moderate	Slight	Slight	Slight or moderate.[3]	Slight	Loblolly pine, slash pine, longleaf pine, yellow-poplar, black walnut, cherrybark oak, Shumard oak, sweetgum, eastern redcedar, Arizona cypress.
Severe	Slight	Moderate	Slight	Slight	Loblolly pine, slash pine, longleaf pine, yellow-poplar, black walnut, cherrybark oak, Shumard oak, white ash, eastern redcedar, and Arizona cypress.
Severe	Slight or moderate	Moderate	Slight	Slight	Loblolly pine, slash pine, longleaf pine, yellow-poplar, cherrybark oak, Shumard oak, sweetgum, green ash, and eastern redcedar.
Severe	Slight	Slight or moderate	Slight to severe	Slight	Loblolly pine, slash pine, longleaf pine, yellow-poplar, black walnut, eastern redcedar, and Arizona cypress.
Severe	Slight on drained areas; severe on ponded areas.	Moderate on drained areas; severe on ponded areas.	Slight	Slight	Drained areas: Slash pine and loblolly pine. Undrained areas: Baldcypress, pond pine, sweetgum, swamp tupelo, and green ash.
Severe	Slight on drained areas; severe on ponded areas.	Moderate on drained areas; severe on ponded areas.	Slight	Slight	Drained areas: Loblolly pine, slash pine, longleaf pine, and yellow-poplar. Undrained areas: Baldcypress, pond pine, sweetgum, swamp tupelo, and green ash.
Severe	Slight on drained areas; severe on ponded areas.	Moderate on drained area; severe on ponded areas.	Slight	Slight	Drained areas: Loblolly pine, slash pine, and yellow-poplar. Undrained areas: Baldcypress, pond pine, sweetgum, swamp tupelo, and green ash.
Moderate or severe.	Slight or moderate	Slight	Slight [3]	Slight	Loblolly pine, slash pine, longleaf pine, eastern redcedar, and Arizona cypress.
Severe	Slight or moderate	Moderate	Slight	Slight	Slash pine, loblolly pine, longleaf pine, and eastern redcedar.
Severe	Slight on drained areas; severe on ponded areas.	Moderate on drained areas; severe on ponded areas.	Slight	Slight	Drained areas: Slash pine, loblolly pine, and longleaf pine. Undrained areas: Baldcypress, Atlantic white-cedar, and sweetgum.
Moderate or severe.	Moderate	Slight or moderate	Slight [3]	Slight	Slash pine, loblolly pine, longleaf pine, eastern redcedar, and Arizona cypress.

TABLE 3.—*Woodland*

Woodland group	Soil types	Potential productivity					
		Loblolly pine		Longleaf pine		Slash pine	
		Site index [1]	*No. of plots sampled*	*Site index* [1]	*No. of plots sampled*	*Site index* [1]	*No. of plots sampled*
Group 12: Deep, somewhat excessively drained soils that have a rapidly permeable surface layer 40 inches or more thick.	Lakeland sand	75±8	36	63±12	100	78±10	(2)
Group 13: Well-drained or somewhat excessively drained soils that have a shallow or moderately deep root zone and a firm, compact, slightly cemented subsoil in which permeability is moderately slow or slow.	Hoffman loamy sand	65	2	57±3	9	65	(2)
	Vaucluse loamy sand	69±9	9	55±6	28	69	(2)
Group 14: Deep, excessively drained sands that are rapidly permeable.	St. Lucie sand						
Group 15: Miscellaneous land types	Swamp						
Group 16: Miscellaneous land types	Smoothed sandy land						

[1] Site index is the height that the dominant trees will reach at 50 years of age; it indicates potential productivity of a soil.

erosion by growing certain kinds of trees, by adjusting the rotation age and cutting cycle, by using special management techniques, and by carefully constructing and maintaining roads, trails, and landings. The ratings are based on the risk of erosion on well-managed woodland that is not protected by special practices. A rating of *slight* means that a small loss of soil is to be expected; generally, it applies if slopes are less than 6 percent. A rating of *moderate* indicates that a moderate loss of soil can be expected if runoff is not controlled and the vegetative cover is not adequate; generally, it applies if slopes are 6 to 10 percent. The erosion hazard is rated as *severe* if slopes are steep, infiltration and permeability are slow, and the surface is bare.

WINDTHROW HAZARD.—Resistance to windthrow depends on the firmness with which the roots anchor a tree in the soil. It is controlled partly by soil characteristics and partly by the nature of the root system of the particular species. The hazard of windthrow is an important factor to consider in choosing trees for thinning, release cutting, and intermediate cutting, regeneration, and harvest cutting. A rating of *slight* means that windthrow presents no special problem. A rating of *moderate* indicates that root development of the designated species is adequate for stability, except during periods of excessive wetness and periods of high wind velocity. A rating of *severe* means that the rooting is not deep enough to give adequate stability. A high water table or a hardpan may restrict the depth of rooting.

Except for the site index ratings, the information in table 3 is based largely upon field observations, experience, and the judgement of local foresters, soil scientists, and landowners. Some of the information, however, is based on the results of research. By using published research data, site index can be converted to expected yields (7).

Forest diseases and insects

Attacks by the Nantucket pine tip moth, *Rhyacionia frustana* (*Comst.*), cause deformation of loblolly pines and retard their growth. Pines grown on the soils of groups 1, 8, and 11, and on the Gilead soils of group 4 are sometimes damaged severely. Nematodes cause severe damage to pines grown on the soils of group 1.

The root rot fungus, *Fomes annosus*, is a serious problem in growing pine and redcedar on Lakeland sand and on Hoffman and Vaucluse soils. Root systems are often loosened by high winds, and even if the trees do not fall, they are weakened and their susceptibility to disease is heightened.

Use of the Soils for Wildlife [5]

The soils of Scotland County produce food, cover, and protection for many kinds of wildlife. Bobwhite, dove, rabbit, squirrel, fox, raccoon, and many nongame birds are common in most parts of the county and especially in cultivated areas. Deer and turkey are to be found mainly in the Sandhills, primarily in and around the Sandhills State Wildlife Area. Wood ducks, mallards, and black ducks are fairly numerous near streams, swamps, and beaver ponds during fall and winter. Many broods of young wood ducks are hatched in the wetlands each year. The wetlands are also inhabited by beaver, otter, mink, and muskrat. Fishing is fair to excellent in the

[5] By E. R. SMITH, biologist, Soil Conservation Service.

groups of soils—Continued

Hazards and limitations					Species priority for planting
Plant competition	Seedling mortality	Equipment limitations	Water erosion hazard	Windthrow hazard	
Severe	Moderate or severe	Moderate or severe	Slight or moderate.[3]	Slight	Slash pine, longleaf pine, loblolly pine, eastern redcedar, and Arizona cypress.
Severe	Slight or moderate	Slight to severe	Slight to severe	Moderate or severe.	Slash pine, loblolly pine, longleaf pine, and eastern redcedar.
Severe	Severe	Moderate	Slight	Slight	This soil is unsuitable for commercial production of trees.
Severe	Slight on drained areas; severe on flooded areas.	Severe	Slight	Slight	Drained areas: Slash pine and loblolly pine. Undrained areas: Baldcypress, water tupelo, and swamp tupelo.
Variable	Variable	Variable	Variable	Variable	Slash pine and loblolly pine.

[2] Estimates based on similar soil or on comparative site index of other species on the same soil.
[3] Large open areas are subject to wind erosion.

many farm ponds and lakes and in the larger streams.

The food and habitat requirements of the major kinds of wildlife in the county are discussed in the following paragraphs.

BEAVER.—Beavers eat plant foods only, mostly bark, roots, tender twigs, and green plants. Their choice food is the tender bark, or cambium, of alder, ash, birch, cottonwood, hornbeam, maple, pine, sweetgum, and willow. Beaver also eat the tender shoots of elder, honeysuckle, grass, and weeds. Acorns and corn are also choice foods. The chief feeding areas are within 150 feet of water.

BOBWHITE.—Bobwhites eat acorns, beechnuts, blackberries, browntop millet, wild black cherries, corn, cowpeas, dewberries, annual and shrub lespedezas, milo, mulberries, panicgrass, pecans, common ragweed, soybeans, pine seeds, and the fruit of flowering dogwood and sweetgum. They also eat many insects. Their food must be close to sheltering vegetation.

DEER.—Deer eat acorns, clover, cowpeas, greenbrier, honeysuckle, annual and shrub lespedezas, oats, rescuegrass, rye, ryegrass, soybeans, and wheat. They need an adequate supply of surface water for drinking, and wooded areas, 500 acres or more in size, for cover.

DOVE.—Doves eat browntop millet, corn, Japanese millet, pokeberry seeds, common ragweed, grain sorghum, the seeds of pine and sweetgum, and other kinds of seeds. Doves do not eat insects, green leaves, or fruits. They drink water daily.

DUCK.—Ducks eat acorns, beechnuts, browntop millet, corn, Japanese millet, and the seeds of smartweed. These foods must be covered by water to be readily available to ducks. Occasionally, ducks feed on acorns and grains on dry land.

OTTER.—Otters are primarily carnivorous. Their principal food is fish, mainly the coarse, undesirable species. They also eat crayfish, water beetles, water birds, clams, and, occasionally, water-loving mammals. Swamps, rivers, streams, and lakes are the habitat of otters.

RABBIT.—Rabbits eat clover, winter grasses, and other succulent vegetation. They also eat waste grain, bark, and twigs. They especially need cover, such as blackberry or plum thickets or honeysuckle patches.

RACCOON.—Raccoons eat a wide variety of foods. Among their favorite vegetable foods are acorns, chufa, greenbrier, grapes, persimmons, pokeberries, corn, hollyberries, and pecans. Favorite animal foods are frogs, crayfish, grasshoppers, insects, and small mammals. Raccoons inhabit bottom lands and swamps where den trees are plentiful.

SQUIRREL.—Fox squirrels are restricted mainly to the Sandhills area, but gray squirrels are plentiful throughout the county. Their choice foods are acorns, beechnuts, black cherries, corn, hickory nuts, mulberries, pecans, pine mast, and the fruit of blackgum and flowering dogwood.

TURKEY.—Turkeys thrive only in large blocks of woodland, generally 1,000 acres or more in size. They need surface water daily for drinking. They often roost over water in the overhanging branches of large trees. Their choice foods are insects, acorns, beechnuts, blackberries, browntop millet, chufa, clover, corn, cowpeas, wild grapes, hackberries, mulberries, oats, paspalum seeds, pecans, pine mast, rescuegrass, rye, wheat, and the fruit of blackgum and flowering dogwood.

NONGAME BIRDS.—The food preferences of nongame birds differ widely. Several species eat nothing but insects. A few eat insects, nuts, and fruits. Others eat insects and seeds. Many desirable species of nongame birds, such as bluebirds, cardinals, robins, mockingbirds, and tanagers, can be attracted by planting dogwood, holly, Russian-olive, cherry-laurel, pokeberry, privet, pyracantha, multiflora rose, smooth sumac, and sunflowers.

FISH.—The choice foods of many fish are mostly aquatic worms and insects and their larvae. Bass, pickerel, large catfish, crappie, and other predators eat smaller fish. The abundance of such foods is directly related to the fertility of the water, and to a lesser degree, to the fertility of the soils at the bottom of the ponds and lakes. The most common gamefish are bluegill, black crappie, chain pickerel, flier, largemouth bass, pumpkinseed, redfin pickerel, warmouth, and bullhead.

Wildlife groups

Most kinds of wildlife can be related to the soils in a two-step relationship. Each species is related to its choice foods, and in turn, each plant is directly related to the soils.

The soils of Scotland County are placed in seven groups, based on their capacity to produce plants that provide food for wildlife. The "Guide to Mapping Units" at the back of this report lists the wildlife group for each of the soils.

In table 4 many of the plants used for food by wildlife are listed alphabetically, and the suitability of each plant to the soils of six wildlife groups is rated. Wildlife group 7 is not included in the table, because the properties of the soils in this group are too variable for meaningful ratings to be assigned.

TABLE 4.—*Suitability of plants for the soils in six wildlife groups*

[Group 7 is not rated because the soils vary greatly in their suitability for plants]

Kind of plant	Wildlife groups						Choice food for—
	1	2	3	4	5	[1] 6	
Bahiagrass	Good	Good	Fair	Poor	Fair	Fair	Turkey.
Beech	Good	Good	Fair	Poor	Good	Poor	Bobwhite, duck, squirrel, and turkey.
Blackberry and dewberry	Good	Good	Fair	Poor	Fair	Poor	Bobwhite, turkey, and nongame birds.
Black cherry	Good	Good	Fair	Poor	Fair	Poor	Bobwhite, squirrel, and nongame birds.
Blackgum	Fair	Good	Fair	Fair	Fair	Poor	Squirrel, turkey, and nongame birds.
Blueberry	Poor	Fair	Good	Good	Poor	Poor	Turkey and nongame birds.
Browntop millet	Good	Good	Good	Poor	Fair	Poor	Bobwhite, dove, duck, turkey, and nongame birds.
Chufa	Good	Good	Fair	Poor	Fair	Poor	Raccoon and turkey.
Clover, crimson	Good	Good	Fair	Poor	Fair	Poor	Deer, rabbit, and turkey.
Clover, white	Good	Good	Good	Fair	Poor	Poor	Deer, rabbit, and turkey.
Corn	Good	Good	Good	Fair	Fair	Poor	Bobwhite, dove, duck, raccoon, squirrel, turkey, and nongame birds.
Cowpea	Good	Good	Poor	Poor	Good	Fair	Bobwhite, deer, and turkey.
Cypress	Poor	Poor	Good	Good	Poor	Poor	Squirrel.
Dogwood	Good	Good	Fair	Poor	Fair	Poor	Bobwhite, squirrel, turkey, and nongame birds.
Fescue	Good	Good	Good	Fair	Fair	Poor	Deer, rabbit, and turkey.
Grape, wild	Good	Good	Fair	Poor	Fair	Fair	Raccoon, turkey, and nongame birds.
Greenbrier	Poor	Fair	Good	Good	Poor	Poor	Deer and raccoon.
Hackberry	Good	Good	Good	Fair	Good	Poor	Turkey and nongame birds.
Hickory	Good	Good	Poor	Poor	Fair	Poor	Squirrel.
Holly	Good	Good	Good	Fair	Good	Poor	Raccoon and nongame birds.
Honeysuckle	Good	Good	Good	Poor	Poor	Poor	Deer and nongame birds.
Japanese millet	Poor	Good	Good	Fair	Poor	Poor	Dove, duck, and nongame birds.
Lespedeza, annual	Good	Good	Good	Fair	Fair	Poor	Bobwhite and deer.
Lespedeza, shrub	Good	Good	Fair	Poor	Fair	Poor	Bobwhite and deer.
Magnolia	Fair	Fair	Good	Good	Poor	Poor	Squirrel and nongame birds.
Mulberry	Good	Good	Good	Fair	Good	Poor	Bobwhite, squirrel, turkey, and nongame birds.
Oak (turkey, post, and blackjack).	Poor	Poor	Poor	Poor	Good	Good	Deer, duck, raccoon, squirrel, turkey, and nongame birds.
Oak (white, southern red, scarlet, and water).	Good	Good	Good	Poor	Poor	Poor	Deer, duck, raccoon, squirrel, turkey, and nongame birds.
Oats	Good	Good	Fair	Poor	Fair	Poor	Deer, rabbit, and turkey.
Panicgrass	Good	Good	Good	Fair	Poor	Poor	Bobwhite, dove, nongame birds, and rabbit.

See footnote at end of table.

TABLE 4.—*Suitability of plants for the soils in six wildlife groups*—Continued

Kind of plant	Wildlife groups						Choice food for—
	1	2	3	4	5	[1] 6	
Paspalum	Fair	Good	Good	Fair	Poor	Poor	Bobwhite, dove, and nongame birds.
Peanut	Good	Fair	Poor	Poor	Fair	Poor	Bobwhite and nongame birds.
Pecan	Good	Fair	Poor	Poor	Good	Poor	Bobwhite, raccoon, squirrel, and turkey.
Persimmon	Good	Good	Fair	Fair	Good	Poor	Raccoon.
Pine, pond	Poor	Poor	Good	Good	Poor	Poor	Bobwhite, dove, squirrel, turkey, and nongame birds.
Pine (varieties other than pond pine).	Good	Good	Good	Poor	Good	Fair	Bobwhite, dove, squirrel, turkey, and nongame birds.
Plum, Chickasaw	Good	Good	Fair	Fair	Good	Poor	Squirrel and bobwhite.
Pokeberry	Good	Good	Fair	Poor	Fair	Poor	Dove, raccoon, and nongame birds.
Ragweed	Good	Good	Good	Poor	Fair	Poor	Bobwhite, dove, and nongame birds.
Rescuegrass	Good	Good	Good	Poor	Fair	Poor	Deer and turkey.
Rye	Good	Fair	Poor	Poor	Good	Fair	Deer, rabbit, and turkey.
Ryegrass	Good	Good	Good	Fair	Fair	Poor	Deer and rabbit.
Smartweed	Good	Good	Good	Good	Poor	Poor	Duck.
Sorghum, grain	Good	Good	Good	Poor	Fair	Poor	Bobwhite, dove, and nongame birds.
Soybeans	Good	Good	Good	Fair	Fair	Poor	Deer.
Sweetgum	Good	Good	Good	Fair	Poor	Poor	Bobwhite, dove, and nongame birds.
Tickclover	Good	Good	Fair	Poor	Fair	Poor	Bobwhite, turkey, and nongame birds.
Tupelo	Poor	Poor	Good	Good	Poor	Poor	Raccoon and squirrel.
Wheat	Good	Good	Fair	Poor	Fair	Good	Bobwhite, dove, deer, rabbit, turkey, and nongame birds.

[1] Soils of this group can be used to grow food for wildlife, but a high or very high level of management is required.

With a knowledge of each animal's food requirements and of the suitability of soils for the growth of particular plants, the symbols on the soil map can be used as guides to the selection of areas suitable for specified kinds of wildlife. The characteristics of the soils in each wildlife group that are significant to their management for wildlife are described in the following paragraphs.

WILDLIFE GROUP 1

This group consists of well drained or moderately well drained soils that have a surface layer of loamy sand to sandy loam and a subsoil of friable to very firm sandy loam to sandy clay. These soils are low or medium in fertility and available water capacity. The slope ranges from nearly level to strongly sloping. The erosion hazard is slight to moderately severe.

WILDLIFE GROUP 2

This group consists of moderately well drained or somewhat poorly drained soils that have a surface layer of loamy sand to fine sandy loam and a subsoil of very friable to firm loamy sand to sandy clay. These soils are nearly level.

WILDLIFE GROUP 3

This group consists of somewhat poorly drained to very poorly drained soils in Carolina bays (oval depressions lacking natural drainage outlets) and other low, flat areas. Water ponds on these soils during the wetter months. It stands for long periods in areas that are not artificially drained. The soils have a dark-colored surface layer of loam to fine sandy loam and a subsoil of friable to very firm sandy loam to clay.

WILDLIFE GROUP 4

This group consists of poorly drained or very poorly drained soils in bays and swampy areas along streams. Water ponds on these soils for long periods. The soils range from grayish sand and loamy sand to black loam and mucky loam.

WILDLIFE GROUP 5

This group consists of well-drained or somewhat excessively drained soils that have a surface layer of loamy sand to sand, 20 to 30 inches thick, and a subsoil of friable to firm sandy loam to sandy clay. Fertility and available water capacity are low or very low. The slope ranges from nearly level to sloping. Little erosion has taken place.

WILDLIFE GROUP 6

This group consists of well-drained to somewhat excessively drained sand and loamy sand. Fertility and available water capacity are low or very low. The slope ranges from nearly level to steep. These soils produce little food or cover for wildlife.

WILDLIFE GROUP 7

This group consists of a very sandy soil and a miscellaneous land type, the properties of which are extremely variable. On-site investigation is necessary to determine the capacity of the soils to produce food and cover for wildlife.

Engineering Uses of the Soils [6]

Some soil properties are of special interest to engineers because they affect the construction and maintenance of roads, airports, pipelines, building foundations, facilities for water storage, erosion control structures, drainage systems, sewage disposal systems, and sewage lagoons, and the suitability of materials for subgrade, roadfill, and topsoil. The properties most important to the engineer are permeability to water, shear strength, compaction characteristics, soil drainage, shrink-swell characteristics, grain size, plasticity, pH values, depth to water table, and topography.

This report contains information that can be used by engineers to—

1. Make studies that will aid in selecting and evaluating areas for industrial, business, and residential sites.
2. Make preliminary estimates of the engineering properties of soils in planning for agricultural drainage systems, farm ponds, irrigation systems, diversions, and terraces.
3. Make preliminary evaluations of soil and ground conditions that will aid in selecting locations for highways and airports and in planning detailed investigations of the selected locations.
4. Locate sources of construction materials.
5. Correlate the performance of engineering structures with soil mapping units, so that information useful in designing and maintaining the structures can be obtained.
6. Determine the suitability of the soils for cross-country movement of vehicles and construction equipment.
7. Supplement information from other maps and reports and from aerial photographs for the purpose of making maps and reports that can be readily used by engineers.

With the soil map for identification of soil areas, the engineering interpretations reported here can be useful for many purposes. *It should be emphasized, however, that these interpretations may not eliminate the need for sampling and testing at the site of specific engineering works involving heavy loads and excavations deeper than the depth of layers here reported.* Even in these situations, the soil map is useful for planning more detailed field investigations and for suggesting the kinds of problems that may be expected.

Some of the terms used by agricultural soil scientists may be unfamiliar to engineers, and some words—for example, *soil*, *clay*, *silt*, *sand*, and *consistence*—may have special meanings in soil science. These terms are defined in the Glossary at the end of the report.

In order to make the best use of the map and the narrative report, the engineer should understand the classification system used by soil scientists. He should also have a knowledge of the physical properties of the soil material and the condition of the soil in place.

[6] S. T. CURRIN and D. L. BASINGER, civil engineers, Soil Conservation Service, assisted in writing this section.

Soil test data

Samples from four selected soil types in Scotland County were tested by the Bureau of Public Roads so that the soils could be evaluated for engineering purposes. The test data are given in table 5. Each soil was sampled at only one location, and the test data indicate the characteristics of the soil at the specified location. All of the samples were taken at a depth of less than 6 feet. The data, therefore, probably are not adequate for estimating the characteristics of soil materials in strongly sloping or steep areas, where deep cuts are required.

The engineering classifications given in table 5 are based on data obtained by mechanical analyses and by tests to determine liquid limits and plastic limits. Mechanical analyses were made by combined sieve and hydrometer methods.

The tests to determine plastic limit and liquid limit measure the effect of water on the consistence of the soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a solid to a semisolid to a plastic state. As 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 passes from a semisolid to a plastic state. The liquid limit is the moisture content at which the material passes 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 within which the soil material is in a plastic condition.

Engineering classification of soils

Most highway engineers classify soil materials according to the system used by the American Association of State Highway Officials (AASHO) (*1*). In this system soils are classified in seven principal groups. The groups range from A–1 (gravelly soils of high bearing capacity) to A–7 (clayey soils having low bearing capacity when wet). The relative engineering value of the soils within each group is indicated by group index numbers, which range from 0 for the best material to 20 for the poorest. The group index numbers can be determined accurately only if the soils have been analyzed. The group indexes for the soils that have been analyzed are shown in table 5.

Some engineers prefer to use the Unified soil classification system (*8*). In this system soil materials are identified as coarse grained (eight classes), fine grained (six classes), or highly organic.

The classification of a soil by either the AASHO or the Unified system identifies the soil material with regard to gradation and plasticity. The classification permits the engineer to appraise the soil quickly by comparing it with other soils that have the same classification.

Engineering properties of the soils

Table 6 gives some of the significant characteristics of the soils of the county. It also gives the engineering classification of the principal horizons of typical profiles. The depth to the seasonally high water table is based on field observations. Rock does not occur within the depths described.

TABLE 5.—*Engineering test data*

[Tests performed by the Bureau of Public Roads (BPR) in accordance with standard procedures of the American Association of State Highway Officials (AASHO) (*1*)]

Soil name and location	Bureau of Public Roads report No.	Depth from surface	Horizon	Mechanical analysis [1]							Liquid limit	Plasticity index	Classification	
				Percentage passing sieve—			Percentage smaller than—						AASHO	Unified
				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.				
Coxville loam:		*Inches*												
1 mile N. of Laurinburg	S41631	0 to 4	A1	100	90	72	69	53	40	34	46	15	A–7–5(10)	ML.
on U.S. Highway 501.	S41632	4 to 30	B2g	100	91	75	72	63	54	49	52	28	A–7–6(18)	CH.
Gilead loamy sand:														
0.75 mile N. of Wright's	S41633	0 to 7	Ap	100	87	40	31	15	7	5	(2)	(2)	A–4(1)	SM.
store and 2,000 feet E.	S41634	16 to 25	B22	100	87	59	55	43	34	31	37	20	A–6(9)	CL.
of U.S. Highway 501.	S41635	35 to 60	C	100	78	42	38	31	24	23	30	16	A–6(3)	SC.
McColl loam:														
1 mile NE. of Gibson and	S41636	0 to 8	Ap	100	87	50	46	38	29	25	29	11	A–6(3)	SC.
0.25 mile W. of school.	S41637	8 to 13	B21g	100	86	56	52	47	41	38	38	19	A–6(8)	CL.
	S41638	30 to 55	C1	100	81	53	51	46	40	36	46	23	A–7–6(9)	CL.
	S41639	55 to 66	C2	100	70	23	21	19	17	17	28	9	A–2–4(0)	SC.
Vaucluse loamy sand:														
0.75 mile E. of Pate's	S41640	5 to 18	A2	100	76	32	26	18	11	8	(2)	(2)	A–2–4(0)	SM.
store. (Non-modal;	S41641	27 to 32	B22	[3] 97	86	64	59	52	45	42	55	28	A–7–6(15)	CH.
has thin plastic layer.)	S41642	40 to 50	C	100	75	27	25	25	25	23	30	11	A–2–6(0)	SC.

[1] Mechanical analysis according to AASHO Designation: T 88–57 (*1*). Results by this procedure may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO 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 soil survey procedure, the fine material is analyzed by the pipette method, and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analysis data used in this table are not suitable for use in naming textural classes for soils.

[2] Nonplastic.

[3] Ninety-eight percent passed No. 4 sieve (4.7 mm.), 98 percent passed the ¾-inch sieve, 99 percent passed the 2-inch sieve, and 100 percent passed the 3-inch sieve.

The soil material in the main horizons is classified according to textural terms used by the U.S. Department of Agriculture. Except for the soils listed in table 5, for which engineering test data are available, the classifications shown for the Unified and AASHO systems are estimates based on the USDA classification of texture and the descriptions of the soils.

The estimates of permeability are for uncompacted soil material. They are based on field observations and limited laboratory data.

Available water capacity refers to the water in the soil that is available to plants. It is the amount of water held in the soil between field capacity and the permanent wilting point, that is, between ⅓ atmosphere and 15 atmospheres of tension. The amounts are based on laboratory tests of a limited number of soils; for soils not tested, estimates are based on similar soils.

Reaction, or the degree of acidity or alkalinity, is given in terms of pH values.

Shrink-swell potential indicates the expected change in volume when the moisture content changes. It is estimated primarily on the basis of the amount and type of clay in a soil. In general, soils classified as CH and A–7 have a high shrink-well potential. Sandy soils have a low shrink-swell potential.

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Engineering interpretations

Erosion control practices are needed on sloping cultivated soils. Terraces are suitable for all the soils in the county that have a slope of not more than 6 percent, except those with a thick, sandy surface layer. Most soils need smoothing to make feasible the construction of parallel terraces, the use of four-row equipment, and row drainage.

Adequate outlets need to be constructed for safe disposal of surface runoff from terraces, diversions, and other drainageways. Vegetation is needed in these waterways. Grade-control structures, such as pipe drops, drop spillways, sod chutes, and supporting agronomic practices are needed in places to control erosion.

Table 7 gives interpretations of the properties that affect the suitability of the soils for engineering.

The ratings as a source of topsoil are based on thickness, texture, fertility, and available water capacity. For instance, droughty sands are given a poor rating, but loams are rated fair to good, depending on the thickness of the material.

Suitability as a source of road fill is rated according to texture, shrinkage, plasticity, water content, and the degree of compactive effort required to obtain the desired density. The water content of the soil at the time of use

TABLE 6.—*Estimated*

[Dashed lines indicate that properties are too

Soil series and map symbols	Depth to seasonally high water table	Depth from surface (typical profile)	Classification
			USDA texture
	Feet	*Inches*	
Alluvial land, wet (Al)	0		
Bibb (Ba)	0	0 to 32	Loam to sandy loam
		32 to 50	Sandy loam to sandy clay
Blaney (BnB, BnC)	4+	0 to 24	Sand
		24 to 40	Sandy clay loam
		40 to 48	Sandy clay loam to sandy loam
Chipley (Ch)	2. 5	0 to 7	Loamy sand
		7 to 48	Sand to loamy sand
Coxville (Co) [1]	0	0 to 7	Loam
		7 to 60	Clay to sandy clay
Craven (CrB2, CrC2)	3	0 to 5	Sandy loam
		5 to 24	Silty clay
		24 to 42	Clay to sandy clay
Dunbar (Db)	1. 5	0 to 8	Fine sandy loam
		8 to 50	Sandy clay
Duplin (Dp)	2	0 to 8	Sandy loam
		8 to 32	Sandy clay
		32 to 48	Sandy clay
Eustis (EuB, EuC)	10+	0 to 8	Sand
		8 to 60	Sand or loamy sand
Faceville (FaA, FaB, FaB2, FaC2)	10+	0 to 8	Loamy sand
		8 to 48	Sandy clay loam to sandy clay
Gilead (GdA, GdB, GdB2, GdC, GdC2, GdD) [1]	3+	0 to 7	Loamy sand
		7 to 35	Sandy clay loam
		35 to 60	Sandy clay loam
Goldsboro (GoA)	2. 5	0 to 16	Loamy sand
		16 to 42	Sandy clay loam
Hoffman (HfC2, HfD)	10+	0 to 5	Loamy sand
		5 to 16	Clay
		16 to 42	Sandy clay
Johns (Jo)	1. 5	0 to 15	Loamy sand to sandy loam
		15 to 28	Sandy clay loam
		28 to 42	Sand
Johnston (Jm)	0	0 to 30	Mucky loam
		30 to 50	Fine sandy loam
Kalmia (KaA)	7	0 to 12	Loamy sand
		12 to 32	Sandy clay loam
		32 to 48	Loamy sand to sand
Kenansville (KnA, KnB)	8	0 to 22	Loamy sand
		22 to 36	Sandy loam
		36 to 50	Loamy sand or sand
Lakeland (LkB, LkD)	10+	0 to 48+	Sand
Lumbee (Lu)	0	0 to 14	Loamy sand
		14 to 36	Sandy clay loam
		36 to 42	Loamy sand to sand
Lynchburg (Ly)	1. 5	0 to 7	Loamy sand
		7 to 48	Sandy clay loam to sandy loam

See footnote at end of table.

properties of the soils

variable for reliable estimates to be made]

Classification—Continued		Percentage passing sieve No. 200 (0.074 mm.)	Permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO					
			Inches per hour	*Inches per inch of soil*	*pH*	
SM, CL	A-2, A-6	25 to 55	2. 0 to 6. 3	0. 13	4. 5 to 5. 0	Low.
SC, CL	A-2, A-6	25 to 55	0. 63 to 2. 0	. 14	4. 5 to 5. 0	Low.
SP, SM	A-3, A-2	0 to 25	>6. 3	. 06	4. 5 to 5. 0	Low.
SC, CL	A-6	40 to 65	0. 63 to 2. 0	. 10	4. 5 to 5. 0	Low.
SC, SM	A-2, A-4	15 to 40	0. 2 to 0. 63	. 10	4. 5 to 5. 0	Low.
SM, SP-SM	A-2	12 to 25	>6. 3	. 08	5. 1 to 5. 5	Low.
SM, SP-SM	A-2, A-3	5 to 15	>6. 3	. 06	4. 5 to 5. 0	Low.
ML, CL	A-6, A-7	55 to 90	0. 63 to 2. 0	. 16	4. 5 to 5. 0	Low.
CH, CL	A-7	55 to 90	<0. 2	. 14	4. 5 to 5. 0	Moderate.
SM, SC	A-4, A-2	15 to 40	0. 63 to 2. 0	. 14	5. 1 to 5. 5	Low.
CL, MH-CH	A-7	60 to 90	<0. 2	. 16	4. 5 to 5. 0	High.
CH	A-7	60 to 90	<0. 2	. 14	4. 5 to 5. 0	High.
SM	A-2	15 to 35	0. 63 to 2. 0	. 14	5. 1 to 5. 5	Low.
CL	A-6, A-7	50 to 65	0. 2 to 0. 63	. 14	4. 5 to 5. 0	Moderate.
SM	A-2	15 to 35	2. 0 to 6. 3	. 14	5. 1 to 5. 5	Low.
SC, CL	A-6	40 to 65	0. 2 to 0. 63	. 14	4. 5 to 5. 5	Low.
SC, CL	A-6	40 to 65	0. 63 to 2. 0	. 14	4. 5 to 5. 0	Moderate.
SP-SM	A-2	5 to 25	>6. 3	. 06	5. 1 to 5. 5	Low.
SM	A-2	5 to 25	>6. 3	. 06	4. 5 to 5. 0	Low.
SM	A-2	12 to 25	2. 0 to 6. 3	. 09	5. 1 to 5. 5	Low.
SC, CL	A-6	35 to 65	0. 63 to 2. 0	. 14	4. 5 to 5. 5	Low.
SM	A-2, A-4	12 to 45	>6. 3	. 06	5.1 to 5.5	Low.
SC, CL	A-4, A-6	35 to 65	0.63 to 2.0	. 10	4.5 to 5.0	Moderate.
SC	A-4, A-6	35 to 50	0.2 to 0.63	. 10	4.5 to 5.0	Low.
SM, SC-SM	A-2	12 to 35	2.0 to 6.3	. 10	5.1 to 5.5	Low.
SC, CL	A-6, A-4	35 to 65	0.63 to 2.0	. 12	4.5 to 5.5	Low.
SM, SP-SM	A-2	5 to 25	>6. 3	. 07	4.5 to 5.0	Low.
CH, CL	A-7	55 to 80	<0. 2	. 11	4.5 to 5.0	Moderate.
SC, CL	A-6	35 to 65	0.63 to 2.0	. 10	4.5 to 5.0	Low.
SM	A-2	12 to 25	2 to 6.3	. 08	5.1 to 5.5	Low.
CL, SC	A-6, A-4	35 to 65	0.63 to 2.0	. 14	4.5 to 5.0	Low.
SP, SM	A-3, A-2	0 to 35	0.63 to 2.0	. 10	4.5 to 5.0	Low.
OL, ML	A-4	55 to 90	>6. 3	. 18	4.5 to 5.0	Moderate.
SC, SM, CL	A-2, A-6	20 to 65	0.63 to 2.0	. 14	4.5 to 5.0	Low to moderate.
SM	A-2	12 to 25	2.0 to 6.3	. 08	5.1 to 5.5	Low.
SC, CL	A-2, A-6	25 to 65	0.63 to 2.0	. 14	4.5 to 5.5	Low.
SP-SM, SM	A-2	5 to 30	2.0 to 6.3	. 12	4.5 to 5.0	Low.
SM	A-2	12 to 25	>6. 3	. 08	5.1 to 5.5	Low.
SM	A-2	15 to 35	2.0 to 6.3	. 12	4.5 to 5.5	Low.
SM, SP-SM	A-2	12 to 25	2.0 to 6.3	. 08	4.5 to 5.0	Low.
SP, SP-SM	A-3, A-2	0 to 12	>6. 3	. 05	4. 5 to 5. 5	Low.
SM	A-2	12 to 25	0. 63 to 2. 0	. 08	4. 5 to 5. 0	Low.
SC, CL	A-4, A-6	35 to 65	2. 0 to 0. 2	. 14	4. 5 to 5. 0	Low to moderate.
SM, SP-SM	A-2	5 to 15	0. 63 to 2. 0	. 12	4. 5 to 5. 0	Low.
SM	A-2	12 to 25	2. 0 to 6. 3	. 08	5. 1 to 5. 5	Low.
CL, SC, SM	A-6, A-4	35 to 65	0. 63 to 2. 0	. 14	4. 5 to 5. 0	Low.

TABLE 6.—*Estimated properties*

Soil series and map symbols	Depth to seasonally high water table	Depth from surface (typical profile)	Classification
			USDA texture
	Feet	*Inches*	
Mantachie (Ma)	1. 5	0 to 16	Loamy sand
		16 to 22	Sandy loam
		22 to 42	Sandy clay loam
Marlboro (MbA, MbB, MbB2)	10+	0 to 8	Loamy sand
		8 to 48	Sandy clay
		48 to 60	Sandy clay loam
McColl (Mc)[1]	0	0 to 8	Loam
		8 to 13	Clay or sandy clay
		13 to 55	Sandy clay loam or sandy clay
Maxton (MxA)	10+	0 to 12	Loamy sand
		12 to 39	Sandy clay loam
		39 to 50	Sand
Norfolk (NoA, NoB, NoB2, NoC2)	10+	0 to 15	Loamy sand
		15 to 62	Sandy loam to sandy clay loam
Ocilla (Oc)	1. 5	0 to 22	Loamy sand
		22 to 44	Sandy clay loam
		44 to 50	Sandy clay loam
Okenee (Ok)	0	0 to 16	Loam
		16 to 28	Sandy loam to sandy clay loam
		28 to 42	Sand or loamy sand
Orangeburg (OrA, OrB, OrB2, OrC2)	10+	0 to 10	Loamy sand
		10 to 48	Sandy loam to sandy clay loam
Plummer (Pl, Ps)	0	0 to 42	Loamy sand or sand
		42 to 60	Sandy loam to sandy clay loam
Portsmouth (Pt)	0	0 to 10	Loam
		10 to 28	Sandy clay loam
		28 to 60	Sandy loam to sandy clay
Rains (Ra)	0	0 to 14	Fine sandy loam
		14 to 50	Sandy loam to sandy clay loam
Rutlege (Ru)	0	0 to 11	Loamy sand
		11 to 60	Loamy sand or sand
St. Lucie (Sl)	5	0 to 50	Sand
Smoothed sandy land (Sm)			
Swamp (Sw)			
Vaucluse (VaB, VaB2, VaC, VaC2, VaD, VaD2)[1]	10+	0 to 12	Loamy sand
		12 to 17	Sandy clay loam
		17 to 52	Sandy loam to sandy clay loam
Wagram (WaA, WaB, WaC)	10+	0 to 24	Loamy sand
		24 to 60	Sandy loam to sandy clay loam
Wagram (WsB, WsC, WsD)	10+	0 to 36	Sand
		36 to 60	Sandy loam to sandy clay loam

[1] Properties given are based on data in table 5.

of the soils—Continued

Classification—Continued		Percentage passing sieve No. 200 (0.074 mm.)	Permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO					
			Inches per hour	*Inches per inch of soil*	*pH*	
SM	A–2	12 to 20	2. 0 to 6. 3	0. 09	5. 1 to 5. 5	Low.
SM, SC	A–2	12 to 35	2. 0 to 6. 3	. 11	4. 5 to 5. 0	Low.
SC, CL	A–2, A–6	25 to 65	0. 63 to 2. 0	. 14	4. 5 to 5. 0	Low.
SM	A–2	12 to 30	2. 0 to 6. 3	. 09	5. 1 to 5. 5	Low.
SC, CL	A–6	35 to 65	0. 2 to 0. 63	. 16	4. 5 to 5. 5	Moderate to low.
SC, CL	A–6	35 to 65	0. 63 to 2. 0	. 16	4. 5 to 5. 0	Low.
ML, CL	A–4, A–6	50 to 60	0. 63 to 2. 0	. 14	4. 5 to 5. 0	Low.
CH, CL	A–6, A–7	50 to 80	<0. 2	. 16	4. 5 to 5. 0	Moderate.
SC, CL	A–7, A–6	35 to 60	0. 2 to 0. 63	. 15	4. 5 to 5. 0	Moderate.
SM	A–2	12 to 25	2. 0 to 6. 3	. 08	5. 1 to 5. 5	Low.
SC, CL	A–6	35 to 65	0. 63 to 2. 0	. 13	4. 5 to 5. 5	Low.
SP–SM	A–2	5 to 15	2. 0 to 6. 3	. 05	4. 5 to 5. 0	Low.
SM	A–2	12 to 25	2. 0 to 6. 3	. 08	5. 1 to 5. 5	Low.
SC, CL	A–4, A–6	35 to 65	0. 63 to 2. 0	. 15	4. 5 to 5. 5	Low.
SP–SM, SM	A–2	5 to 30	>6. 3	. 08	5. 1 to 5. 5	Low.
SM–SC, SC	A–2, A–4	15 to 40	2. 0 to 6. 3	. 13	4. 5 to 5. 0	Low.
SC	A–4, A–2	15 to 40	0. 2 to 0. 63	. 13	4. 5 to 5. 0	Low.
ML, CL, SM	A–4, A–6	35 to 60	2. 0 to 6. 3	. 16	4. 5 to 5. 0	Low.
SM, SC, CL	A–4, A–6	35 to 65	2. 0 to 0. 2	. 16	4. 5 to 5. 0	Low to moderate.
SP, SM	A–2	5 to 20	>6. 3	. 08	4. 5 to 5. 0	Low.
SM	A–2	12 to 25	2. 0 to 6. 3	. 09	5. 1 to 5. 5	Low.
SC, CL	A–4, A–6	35 to 65	0. 63 to 2. 0	. 12	4. 5 to 5. 5	Low.
SP–SM, SM	A–2	5 to 20	>6. 3	. 05	4. 5 to 5. 0	Low.
SM, SC	A–2, A–4	20 to 45	2. 0 to 6. 3	. 11	4. 5 to 5. 0	Low.
ML, CL	A–4, A–6	50 to 60	2.0 to 6.3	. 16	4.5 to 5.0	Low.
SC, CL	A–6	35 to 65	0.2 to 2.0	. 16	4.5 to 5.0	Low to moderate.
SM, SC, CL	A–4, A–6	35 to 65	0.2 to 2.0	. 11	4.5 to 5.0	Low to moderate.
SM	A–2	15 to 35	0.63 to 2.0	. 12	4.5 to 5.0	Low.
SC, CL	A–4, A–6	35 to 65	0.2 to 2.0	. 14	4.5 to 5.0	Low to moderate.
SM	A–2	10 to 25	>6.3	. 07	4.5 to 5.0	Low.
SP, SM	A–2	0 to 25	>6.3	. 05	4.5 to 5.0	Low.
SP	A–3	0 to 5	>6.3	. 05	4.5 to 5.0	Low.
SM	A–2	10 to 30	>6.3	. 07	5.1 to 5.5	Low.
SC, CL	A–4, A–6, A–7	35 to 75	0.2 to 6.3	. 10	4.5 to 5.0	Moderate.
SC, SM	A–4	35 to 50	0.2 to 2.0	. 10	4.5 to 5.0	Low.
SM	A–2	12 to 25	>6. 3	. 08	5. 1 to 5. 5	Low.
SC, CL	A–4, A–6	35 to 60	0. 63 to 2. 0	. 12	4. 5 to 5. 5	Low.
SP–SM	A–2	5 to 15	>6. 3	. 06	5. 1 to 5. 5	Low.
SC, SM	A–2, A–4	20 to 45	0. 63 to 2. 0	. 12	4. 5 to 5. 5	Low.

TABLE 7.—*Engineering*

[Dashed lines indicate that information is not

Soil series and map symbols	Suitability as a source of—		Degree of limitation for sewage disposal	
	Topsoil	Road fill	Filter fields	Lagoons
Alluvial land, wet (Al)	Poor	Poor	Severe: flooding; high water table.	Severe: frequent flooding
Bibb (Ba)	Fair	Fair	Severe: high water table; flooding.	Moderate: organic-matter content 2 to 5 percent.
Blaney (BnB, BnC)	Fair	Fair	Moderate to severe: moderately slow permeability.	Moderate if slope is 2 to 6 percent. Severe if slope is more than 6 percent.
Chipley (Ch)	Poor	Good	Severe: high water table; rapid permeability.	Severe: rapid permeability; organic-matter content 2 to 5 percent.
Coxville (Co)	Fair	Poor	Severe: high water table; slow permeability.	Moderate: organic-matter content 2 to 5 percent.
Craven (CrB2, CrC2)	Fair	Poor	Severe: slow permeability; seasonally high water table.	Moderate (CrB2). Severe (CrC2).
Dunbar (Db)	Fair	Fair	Severe: moderately slow permeability; seasonally high water table.	Moderate: organic-matter content 2 to 5 percent.
Duplin (Dp)	Fair	Fair	Moderate: seasonally high water table.	Slight
Eustis (EuB, EuC)	Poor	Good	Moderate: rapid permeability; limited filtering action.	Severe: rapid permeability (EuB); slope is more than 6 percent (EuC).
Faceville (FaA, FaB, FaB2, FaC2)	Fair	Fair	Moderate: moderate permeability.	Moderate: moderate permeability (FaA, FaB, FaB2). Severe: slope is more than 6 percent (FaC2).
Gilead (GdA, GdB, GdB2, GdC, GdC2, GdD).	Fair	Fair	Moderate to severe if slope is less than 6 percent; moderately slow permeability; severe if slope is more than 6 percent.	Moderate: slope is 2 to 6 percent (GdA, GdB, GdB2). Severe: slope is more than 6 percent (GdC, GdC2, GdD).
Goldsboro (GoA)	Fair	Good	Moderate: seasonally high water table.	Moderate: moderate permeability.

interpretations

available, or that the practice is not applicable]

Soil features affecting—				
Highway location	Farm ponds		Agricultural drainage	Sprinkler irrigation
	Reservoir area	Compacted embankment		
Flooding; high water table.	Flooding		High water table; frequent flooding.	
Flooding; high water table.	Moderate permeability	Moderate or moderately low strength and stability; nearly impervious.	High water table; receives water from surrounding areas.	Medium available water capacity.
Possibility of seepage	Moderately slow permeability.	Moderate or moderately low strength and stability; nearly impervious, except for surface layer.		Low available water capacity.
Seasonally high water table; cut slopes and ditchbanks moderately unstable.	Rapid permeability and excessive seepage.	Moderate strength and stability; pervious or semipervious.	Seasonally high water table; unstable sand and loamy sand.	Low available water capacity.
High water table; plastic soil material.	Slow permeability	Moderately low or low strength and stability; impervious; moderate shrink-swell potential; cracks when dry.	Slow permeability; high water table.	Medium available water capacity; slow permeability.
Plastic soil material; seasonally high water table.	Slow permeability	Moderately low or low strength and stability; impervious; high shrink-swell potential; cracks when dry.	Slow permeability; seasonally high water table.	Medium available water capacity; slow intake rate on eroded areas; slow permeability.
Seasonally high water table.	Moderately slow permeability.	Moderately low strength and stability; nearly impervious; moderate shrink-swell potential; cracks when dry.	Moderately slow permeability; seasonally high water table.	Medium available water capacity.
Seasonally high water table.	Moderately slow permeability.	Moderate or moderately low strength and stability; impervious; moderate shrink-swell potential; cracks when dry.	Seasonally high water table.	Medium available water capacity.
Somewhat excessively drained; cut slopes are moderately unstable.	Rapid permeability and excessive seepage.	Moderate strength and stability; semipervious or pervious.		Low available water capacity.
Well drained; cut slopes are stable.	Moderate permeability	Moderate strength and stability; impervious.		Medium available water capacity.
Seepage	Moderately slow permeability.	Moderate strength and stability; impervious.	Drainage generally not needed; some seepage areas; compact subsoil impedes internal drainage.	Medium available water capacity; slow intake rate on eroded areas.
Seasonally high water table.	Moderate permeability	Moderate or moderately low strength and stability; nearly impervious.	Seasonally high water table.	Medium available water capacity.

TABLE 7.—*Engineering*

Soil series and map symbols	Suitability as a source of—		Degree of limitation for sewage disposal	
	Topsoil	Road fill	Filter fields	Lagoons
Hoffman (HfC2; HfD)	Poor	Fair	Severe: slow permeability (HfC2); slope is more than 10 percent (HfD).	Severe: slopes are more than 6 percent.
Johns (Jo)	Fair	Good	Severe: high water table	Moderate: moderate permeability; organic-matter content 2 to 5 percent.
Johnston (Jm)	Poor	Poor	Severe: high water table; flooding.	Severe: organic-matter content more than 15 percent; flooding.
Kalmia (KaA)	Fair	Good	Moderate: flooding	Moderate: moderate permeability.
Kenansville (KnA, KnB)	Poor	Good	Slight	Severe: moderately rapid permeability.
Lakeland (LkB, LkD)	Poor	Good	Moderate: rapid permeability; limited filtering action.	Severe: rapid permeability.
Lumbee (Lu)	Fair	Fair	Severe: high water table; flooding.	Moderate: organic-matter content 2 to 5 percent.
Lynchburg (Ly)	Fair	Good	Severe: high water table	Moderate: moderate permeability; organic-matter content 2 to 5 percent.
Mantachie soils, local alluvium (Ma).	Fair	Poor	Severe: high water table; flooding.	Moderate: moderate permeability; organic-matter content 2 to 5 percent.
Marlboro (MbA, MbB, MbB2)	Fair	Fair	Moderate: moderately slow permeability.	Slight (MbA). Moderate (MbB, MbB2).
Maxton (MxA)	Fair	Good	Slight	Moderate: moderate permeability.
McColl (Mc)	Poor	Poor	Severe: high water table; moderately slow or slow permeability.	Moderate: organic-matter content 2 to 5 percent.
Norfolk (NoA, NoB, NoB2, NoC2).	Fair	Good	Slight	Moderate: moderate permeability (NoA, NoB, NoB2). Severe: slope is more than 6 percent. (NoC2).
Ocilla (Oc)	Fair	Fair	Severe: high water table	Moderate: moderate permeability; organic-matter content 2 to 5 percent.

interpretations—Continued

Soil features affecting—				
Highway location	Farm ponds		Agricultural drainage	Sprinkler irrigation
	Reservoir area	Compacted embankment		
Severe erodibility	Slow permeability	Moderate or low strength and stability; nearly impervious.		
Seasonally high water table; flooding.	Moderate permeability; flooding.		Seasonally high water table; sand or loamy sand at a depth of about 3 feet.	Medium available water capacity.
High water table; flooding; highly organic surface layer.	Moderate permeability; flooding.		High water table; frequent flooding.	Medium available water capacity.
Well drained; possibility of flooding.	Moderate permeability and seepage; possibility of flooding.	Moderate strength and stability; semipervious; underlying layer is pervious sand in places.		Medium available water capacity.
Well drained; cut slopes are stable.	Moderately rapid permeability; excessive seepage.	Moderate strength and stability; semipervious; underlain by pervious sand in places.		Low available water capacity.
Somewhat excessively drained; cut slopes are moderately unstable.	Rapid permeability; excessive seepage.	Moderate stability, but pervious.		Very low available water capacity.
High water table; flooding.	Moderate or moderately slow permeability; flooding.		High water table; loamy sand or sand at a depth of about 3 feet; flooding.	Medium available water capacity.
Seasonally high water table.	Moderate permeability	Moderate or moderately low strength and stability; nearly impervious.	Seasonally high water table.	Medium available water capacity.
Seasonally high water table; flooding.	Moderate permeability and seepage.	Moderate or moderately low strength and stability; nearly impervious.	Seasonally high water table; brief flooding.	Medium available water capacity.
Well drained; cut slopes are stable.	Moderately slow permeability.	Moderate or moderately low strength and stability; impervious.		Medium available water capacity.
Well drained; cut slopes are stable.	Moderate permeability and seepage.	Moderate or moderately low strength and stability; underlying layer is pervious sand in places.		Medium available water capacity.
High water table; ponding.	Moderately slow or slow permeability.		High water table; moderately slow permeability.	Medium available water capacity; slow intake rate; moderately slow or slow permeability.
Well drained; cut slopes are stable.	Moderate permeability and seepage.	Moderate or moderately low strength and stability; impervious.		Medium available water capacity.
Seasonally high water table.	Moderate permeability	Moderate strength and stability; surface layer pervious, other layers nearly impervious.	Seasonally high water table.	Low available water capacity.

TABLE 7.—*Engineering*

Soil series and map symbols	Suitability as a source of—		Degree of limitation for sewage disposal	
	Topsoil	Road fill	Filter fields	Lagoons
Okenee (Ok)	Good	Fair	Severe: high water table, flooding.	Moderate: organic-matter content 3 to 10 percent; moderate permeability.
Orangeburg (OrA, OrB, OrB2, OrC2).	Fair	Good	Slight	Moderate: moderate permeability (OrA, OrB, OrB2). Severe: slope is more than 6 percent (OrC2).
Plummer (Pl, Ps)	Poor	Good	Severe: high water table	Severe: rapid permeability
Portsmouth (Pt)	Good	Fair	Severe: high water table	Moderate: organic-matter content 3 to 10 percent; moderate or moderately slow permeability.
Rains (Ra)	Fair	Fair	Severe: high water table	Moderate: moderate or moderately slow permeability; organic-matter content 2 to 5 percent.
Rutlege (Ru)	Poor	Fair	Severe: high water table	Severe: rapid permeability
St. Lucie (Sl)	Poor	Fair	Moderate: rapid permeability; limited filtering action.	Severe: rapid permeability
Smoothed sandy land (Sm)				
Swamp (Sw)				
Vaucluse (VaB, VaB2, VaC, VaC2, VaD, VaD2).	Fair	Fair	Moderate: moderately slow or slow permeability (VaB, VaB2, VaC, VaC2). Severe: slope is more than 10 percent (VaD, VaD2).	Moderate (VaB, VaB2). Severe (VaC, VaC2, VaD, VaD2).
Wagram (WaA, WaB, WaC)	Fair	Good	Slight	Moderate: moderate permeability (WaA, WaB). Severe (WaC).
Wagram (WsB, WsC, WsD)	Poor	Good	Moderate: rapid permeability; limited filtering action.	Severe: rapid permeability

interpretations—Continued

Soil features affecting—				
Highway location	Farm ponds		Agricultural drainage	Sprinkler irrigation
	Reservoir area	Compacted embankment		
High water table; flooding.	Moderate permeability; flooding.		High water table; flooding; sand or loamy sand at a depth of about 3 feet.	Medium available water capacity.
Well drained; cut slopes are stable.	Moderate permeability and seepage.	Moderate or moderately low strength and stability; impervious.		Medium available water capacity.
High water table; ditchbanks unstable.	Rapid permeability and seepage.		High water table; unstable sand or loamy sand; flooding.	Low available water capacity.
High water table; flooding.	Moderate or moderately slow permeability; flooding.		High water table; flooding.	Medium available water capacity
High water table	Moderate or moderately slow permeability.	Moderate or moderately low strength and stability; impervious.	High water table	Medium available water capacity.
High water table; flooding; ditchbanks unstable.	Rapid permeability; excessive seepage.		High water table; unstable sand and loamy sand; flooding.	Low available water capacity.
Excessively drained; slopes are unstable.	Rapid permeability; excessive seepage.			
Well drained; cut slopes are stable.	Moderately slow or slow permeability and seepage.	Moderate to low strength and stability; nearly impervious.		Low available water capacity.
Well drained; cut slopes are stable.	Moderate permeability and seepage.	Surface layer has moderate strength and stability; semipervious; other layers have moderate or moderately low strength and stability; impervious.		Low available water capacity.
Well drained; surface layer is moderately unstable.	Rapid permeability and excessive seepage.	Surface layer has moderate strength and stability; pervious; other layers have moderate strength; nearly impervious.		Very low available water capacity.

may affect its suitability. A clayey soil, for example, is difficult to handle when it is wet.

Ratings as a source of sand and gravel are not given, because the sand, except in a few places, contains appreciable quantities of silt and clay, which restricts its use for commercial purposes. Gravel deposits are minor; they occur along stream terraces.

The degree of limitation for sewage disposal by means of filter fields and lagoons is rated according to the permeability of the soil, its slope and filtering capability, the level of the ground water, and the hazard of flooding. Filter fields in poorly drained soils usually fail, because in wet weather and for long periods after rains these soils are saturated and the water table is near the surface. At such times, the movement of effluent is very slow because there is no space for outflow from the septic tank. On-site investigation should be made before installing sewage disposal systems.

The suitability of the soils for highways is affected by such characteristics as plasticity, high water table, drainage, flooding, and stability of slopes. The Kenansville soils, for example, have no soil features adversely affecting their use as locations for highways. Their water table is low enough that it will not interfere with road construction. The soil material has good bearing capacity and is not difficult to compact. Permeability is moderately rapid. On the other hand, the high water table and the plasticity of the Coxville soils are features that adversely affect location of highways.

The suitability of the soils for farm ponds is affected principally by such characteristics as strength, stability, and permeability of the compacted soil material. Strength and stability estimates are based on a standard slope of 2.5 :1 for dams less than 50 feet high. Longer side slopes make a more stable embankment. Permeability of an undisturbed soil is the best indicator of seepage. The permeability ratings used in table 7 range from slow for firm clay to rapid for sand.

As used in table 7, *pervious*, *semipervious*, *nearly impervious*, and *impervious* refer to the relative permeability of compacted embankments. Water loss is excessive in pervious soils and significant in semipervious soils. It is minor in nearly impervious soils and almost negligible in impervious soils.

Soil features that adversely affect agricultural drainage include a high water table and slow permeability. Table 7 gives the soil features likely to present major problems in the installation of drainage systems. Information pertaining to planning and design of drainage systems has been prepared by the Soil Conservation Service and is available in its local offices.

Rainfall in Scotland County is generally adequate for agriculture but is not always well distributed during the growing season. Some of the soils hold little water available to plants. Sprinkler irrigation is beneficial at times. The main factors affecting suitability of a soil for irrigation are available water capacity, permeability, and rate of water intake. The Soil Conservation Service, in cooperation with the Agricultural Research Service, the Agricultural Extension Service, and the North Carolina Agricultural Experiment Station, has prepared an "Irrigation Guide," which gives detailed information useful on the planning and design of sprinkler irrigation systems.

Formation, Classification, and Characteristics of the Soils

This section describes the major factors that have affected the formation and composition of the soils of Scotland County. It discusses briefly the principal processes of soil formation and shows how the soils of the county are classified into categories broader than the series. It also provides a detailed description of a soil profile representative of each series mapped in this county.

Factors of Soil Formation

Soil is the product of certain environmental factors acting upon geologic material. The characteristics of a soil at any given place reflect the local combination of the factors of parent material, climate, plant and animal life, relief, and time.

Parent material

The parent materials of the soils of Scotland County are of two closely related kinds: (1) unconsolidated rock material, sand, silt, and clay that make up the sediments of the Coastal Plain uplands; and, (2) material washed from the Coastal Plain uplands and deposited in drainageways as alluvium. In some places these soil materials have been moved by wind or gravity.

The parent materials in the county differ in mineral and chemical composition and in physical makeup. Major differences, such as texture, can be observed 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 the county reflect the varying geologic materials from which the soils formed.

Climate

The climate of Scotland County is warm and humid. Summers are long and hot. Winters are short and mild, and the ground rarely freezes. The climate is fairly even throughout the county and has caused little difference among the soils. The average annual temperature is 63 degrees. Rainfall is abundant; it averages 47.7 inches a year.

A mild, humid climate such as this favors rapid decomposition of organic matter and hastens chemical reactions in the soil. The plentiful rainfall leaches out large amounts of soluble bases and carries the less soluble fine particles downward. As a result, all the soils of the county are acid and strongly leached. Except for a few very wet areas where standing water has retarded oxidation, the organic-matter content of the soils is low.

Plant and animal life

Plants and animals that live on and in the soil contribute to the makeup of soils. The nature of the changes they bring about depends upon the kinds of life processes peculiar to each. The kinds of plants and animals on or in the soil at any given place are determined by climate, parent material, relief, age of the soil, and the influence of other living organisms. Climate is the most apparent, but not always the most important, factor

in determining the kind of higher plants that grow on the soil.

Generally, the type of vegetation in an area varies according to the nature of the soil. In Scotland County the original forest was chiefly pine. Longleaf pine was dominant on the coarser textured, more droughty soils of the Sandhills. This kind of pine is now associated with turkey oak and wiregrass. Loblolly pine was dominant in the central and southern parts of the county. It grew on many kinds of soils that ranged from well drained to poorly drained. Hardwoods—mainly oaks, maples, and hickories—were intermingled with the pine. The wetter bays and swamps were forested with cypress, juniper, pond pine, and hardwoods.

Organic matter is added to the soil by decaying leaves, roots, twigs, and whole plants. Most of it accumulates on the surface, where it decays and is acted upon by microorganisms, earthworms, and other forms of life, and by chemical processes. Organic matter decays more slowly in the wetter soils than in the better drained soils because excess moisture retards oxidation. Generally, the wetter the soil the greater the accumulation of organic matter.

Plants and animals largely determine the kinds of organic matter added to the soil and the way in which it is incorporated. They transfer nutrients from one horizon to another and sometimes shift soil material from one horizon to another. The life processes of plants and animals may result in accumulation or depletion of organic matter, nitrogen, and other plant nutrients. Soil structure and porosity can also be altered by plant and animal life.

Relief

Relief has been an important factor in soil formation in this county. It strongly influences drainage, aeration, runoff, erosion, and exposure to sun and wind. Relief largely governs natural drainage, and several different types of soil may form from similar parent material because of differences in drainage. The soils in the southern part of Scotland County are nearly level to sloping, and those in the Sandhills area of the northern part are nearly level to moderately steep. Soil material is continually being removed from the steeper slopes or is being mixed by erosion and soil creep. The soils on slopes are shallower and generally are less well developed than those on the smoother, well-drained plains. The nearly level soils in bays are poorly drained and have a dark-colored or black surface horizon. They also have less distinct genetic horizons than the well-drained soils.

Time

Soil profiles require a long time to develop. The degree of horizonation is the chief measure of the effect of time in the formation of soils. Some of the differences among soils reflect differences in the age of the soil, or the length of time the soil has been developing. The soils of Scotland County range from young soils that have little or no profile development to mature soils that are well developed. Recent deposits of alluvium lack well-defined horizons. Soils forming in these deposits are on flood plains along drainageways. Many of the upland soils, by contrast, have distinct, well-defined horizons. Examples of mature soils are those of the Norfolk, Orangeburg, and Marlboro series.

Classification of the Soils

The system of soil classification discussed in this section [7] is that adopted by the Soil Conservation Service as standard for all soil surveys in the United States, effective January 1, 1965. This system has six categories. Beginning with the most inclusive, the categories are the order, the suborder, the great group, the subgroup, the family, and the series. Table 8 gives the classification of the soils of Scotland County according to these categories. Placement of some of the series, particularly in families, may change as more precise information becomes available. The table also shows the great soil group classification according to the system formerly used (*5*).

New soil series must be established and concepts of some of the established series, especially the older ones, must be revised in the course of the nationwide soil survey program. A proposed series is given tentative status during the time its concepts are being studied at State, regional, and national levels of responsibility for soil classification. Three of the soil series identified in this survey had tentative status at the time the report was sent to the printer. They are the Chipley, Johns, and Maxton series.

Characteristics of the Soils

This section discusses each soil series represented in this county and gives a detailed description of a profile that is representative of each. The colors described are for the soils when moist.

BIBB SERIES

Soils in the Bibb series are classified as Fluventic Haplaquepts. They formed in moderately coarse textured to moderately fine textured local alluvium. Their B horizon is gleyed. All physical characteristics are variable.

In this county Bibb soils are associated with Mantachie, Johnston, Rains, Rutlege, and Plummer soils. They are more poorly drained than Mantachie soils. Their horizons indicate periodic accumulation of sediments, which Rains, Rutlege, and Plummer soils lack.

Profile of Bibb soils, local alluvium, three-fourths of a mile north of the John Blue pond, 100 feet north of N.C. Highway 79, in a cultivated field:

Ap—0 to 9 inches, dark-gray (10YR 4/1) loam; weak, medium, granular structure; very friable; strongly acid; clear, wavy boundary. 6 to 12 inches thick.

A12—9 to 24 inches, grayish-brown (10YR 5/2) sandy loam; weak, medium, granular structure; very friable; lenses and pockets of coarser textured or finer textured, light-gray material; strongly acid; abrupt, smooth boundary. 6 to 40 inches thick.

A1b—24 to 28 inches, very dark gray (10YR 3/1) sandy loam; weak, medium, granular structure; very friable; very strongly acid; abrupt, smooth boundary. 2 to 6 inches thick.

A2b—28 to 32 inches, gray (10YR 5/1) sandy loam; weak, medium, granular structure; very friable; very strongly acid; clear, wavy boundary. 3 to 6 inches thick.

Bgb—32 to 50 inches +, light-gray (10YR 7/1) sandy clay loam; few medium mottles of brownish yellow (10YR 6/6); weak, medium, subangular blocky structure; friable; very strongly acid.

[7] UNITED STATES DEPARTMENT OF AGRICULTURE, Soil Survey Staff, SCS. SOIL CLASSIFICATION, A COMPREHENSIVE SYSTEM, 7TH APPROXIMATION. 1960. [Supplement issued in March 1967.]

TABLE 8.—*Classification of soils in Scotland County*

Series	Family	Subgroup	Suborder	Order	Great soil group (1938 classification)
Bibb	Coarse loamy, siliceous, acid, thermic.	Fluventic Haplaquept	Aquept	Inceptisol	Alluvial.
Blaney	Loamy, siliceous, thermic	Arenic Paleudult	Udult	Ultisol	Red-Yellow Podzolic.
Chipley	Siliceous, acid, thermic	Aquic Quartzipsamment.	Psamment	Entisol	Regosol.
Coxville	Clayey, kaolinitic, thermic	Typic Ochraquult	Aquult	Ultisol	Low-Humic Gley.
Craven	Clayey, mixed thermic	Typic Paleudult	Udult	Ultisol	Red-Yellow Podzolic.
Dunbar	Clayey, kaolinitic, thermic	Aquic Paleudult	Udult	Ultisol	Red-Yellow Podzolic intergrading to Low-Humic Gley.
Duplin	Clayey, kaolinitic, thermic	Typic Paleudult	Udult	Ultisol	Red-Yellow Podzolic.
Eustis	Sandy, siliceous, thermic	Psammentic Hapludult	Udult	Ultisol	Regosol.
Faceville	Clayey, kaolinitic, thermic	Typic Paleudult	Udult	Ultisol	Red-Yellow Podzolic.
Gilead	Coarse loamy, siliceous, thermic	Typic Hapludult	Udult	Ultisol	Red-Yellow Podzolic.
Goldsboro	Fine loamy, siliceous, thermic	Typic Paleudult	Udult	Ultisol	Red-Yellow Podzolic.
Hoffman	Clayey, kaolinitic, thermic	Entic Hapludult	Udult	Ultisol	Regosol.
Johns	Fine loamy, siliceous, thermic	Aquic Hapludult	Udult	Ultisol	Red-Yellow Podzolic intergrading to Low-Humic Gley.
Johnston	Coarse loamy, siliceous, acid, thermic.	Cumulic Humaquept	Aquept	Inceptisol	Humic Gley.
Kalmia	Fine loamy, siliceous, thermic	Typic Hapludult	Udult	Ultisol	Red-Yellow Podzolic.
Kenansville	Loamy, siliceous, thermic	Arenic Hapludult	Udult	Ultisol	Red-Yellow Podzolic.
Lakeland	Siliceous, acid, thermic, coated	Typic Quartzipsamment.	Psamment	Entisol	Regosol.
Lumbee	Fine loamy, siliceous, thermic	Typic Ochraquult	Aquult	Ultisol	Low-Humic Gley.
Lynchburg	Fine loamy, siliceous, thermic	Aquic Paleudult	Udult	Ultisol	Red-Yellow Podzolic intergrading to Low-Humic Gley.
Mantachie	Coarse loamy, siliceous, acid, thermic.	Aeric Fluventic Haplaquept.	Aquept	Inceptisol	Alluvial.
Marlboro	Clayey, kaolinitic, thermic	Typic Paleudult	Udult	Ultisol	Red-Yellow Podzolic.
McColl	Clayey, kaolinitic, thermic	Plinthic Ochraquult	Aquult	Ultisol	Low-Humic Gley.
Maxton	Fine loamy, siliceous, thermic	Typic Hapludult	Udult	Ultisol	Red-Yellow Podzolic.
Norfolk	Fine loamy, siliceous, thermic	Typic Paleudult	Udult	Ultisol	Red-Yellow Podzolic.
Ocilla	Loamy, siliceous, thermic	Aquic Arenic Paleudult.	Udult	Ultisol	Red-Yellow Podzolic intergrading to Low-Humic Gley.
Okenee	Fine loamy, siliceous, thermic	Typic Umbraquult	Aquult	Ultisol	Humic Gley.
Orangeburg	Fine loamy, siliceous, thermic	Typic Paleudult	Udult	Ultisol	Red-Yellow Podzolic.
Plummer	Loamy, siliceous, thermic	Grossarenic Ochraquult.	Aquult	Ultisol	Low-Humic Gley.
Portsmouth	Fine loamy, siliceous, thermic	Typic Umbraquult	Aquult	Ultisol	Humic Gley.
Rains	Fine loamy, siliceous, thermic	Typic Ochraquult	Aquult	Ultisol	Low-Humic Gley.
Rutlege	Sandy, siliceous, acid, thermic	Typic Humaquept	Aquept	Inceptisol	Humic Gley.
St. Lucie	Siliceous, acid, hyperthermic, uncoated.	Typic Quartzipsamment.	Psamment	Entisol	Regosol.
Vaucluse	Fine loamy, siliceous, thermic	Typic Fragiudult	Udult	Ultisol	Red-Yellow Podzolic.
Wagram	Loamy, siliceous, thermic	Arenic Paleudult	Udult	Ultisol	Red-Yellow Podzolic.

Range in characteristics.—In most places the A horizon is more than 16 inches thick. Its color ranges from dark gray to black. The B horizon ranges from gray to dark gray in color and from sandy loam to sandy clay in texture. A buried A horizon occurs in many places, generally within 12 to 48 inches of the surface.

BLANEY SERIES

Soils in the Blaney series are classified as Arenic Paleudults. They formed in coarse-textured to moderately fine textured sediments. Their A horizon is thick and coarse textured, and their B horizon is moderately fine textured.

In this county Blaney soils are associated with Gilead, Vaucluse, Lakeland, and Wagram soils. Their A horizon is thicker than that of Gilead and Vaucluse soils, and they have a B horizon, which Lakeland soils lack. Their A horizon is similar to that of Wagram soils, but their B horizon differs from that of those soils in that it is cemented and brittle and less friable.

Profile of Blaney sand, 0 to 6 percent slopes, 1 mile east of Gum Swamp Lake and 500 feet north of crossroads, on east side of county road:

Ap—0 to 7 inches, grayish-brown (2.5Y 5/2) sand; single grain; loose; abundant fine and medium roots; a little coarse quartz gravel; strongly acid; abrupt, smooth boundary. 5 to 10 inches thick.

A2—7 to 24 inches, pale-brown (10YR 6/3) sand; single grain; loose; few fine roots; a little coarse quartz gravel; strongly acid; clear, wavy boundary. 10 to 20 inches thick.

[1] B2ty—24 to 32 inches, light yellowish-brown (10YR 6/4) sandy clay loam; weak, medium, subangular blocky structure; firm and slightly cemented; hard when dry; few fine roots; a little coarse quartz gravel; very strongly acid. 8 to 15 inches thick.

[1] B3y—32 to 40 inches, yellow (10YR 8/6 and 10YR 7/6) sandy

[1] The "y" denotes a brittle, compact, panlike horizon.

clay loam; weak, fine, subangular blocky structure; firm and slightly cemented; few fine roots; a little coarse quartz gravel; very strongly acid. 5 to 12 inches thick.

C—40 to 48 inches +, yellow (10YR 7/6) and light reddish-brown (5YR 6/4) coarse sandy clay loam; common, medium, distinct mottles of light gray (10YR 7/1); massive; compact; much quartz gravel and many fragments of ironstone; very strongly acid.

Range in characteristics.—An A1 horizon is present in places. The Ap and Al horizons range from gray to grayish brown in color, and the A2 horizon ranges from pale brown to light yellowish brown. The A horizon ranges from 20 to 30 inches in thickness. The B horizon ranges from sandy clay loam to light sandy clay in texture and from light yellowish brown to yellowish red in color. The C horizon ranges from coarse sandy loam to sandy clay in texture. Its color varies. Most profiles are mottled with gray, red, and yellowish brown. There are small, rounded pebbles of quartz and fragments of ironstone on the surface and within the profile in some places.

CHIPLEY SERIES

Soils in the Chipley series are classified as Aquic Quartzipsamments. They formed in coarse-textured sediments. The texture, to a depth of more than 40 inches, is sand.

In this county Chipley soils are associated with Lakeland, Plummer, Rutlege, Lynchburg, and Goldsboro soils. They are the moderately well drained members of the Lakeland-Chipley-Plummer-Rutlege drainage sequence. Chipley soils, in drainage and color, are similar to Goldsboro and Lynchburg soils but lack the B horizons typical of those soils.

Profile of Chipley loamy sand, 1 mile southwest of Hasty and 0.2 mile west of county road, in a field of young pine:

Ap—0 to 7 inches, dark-gray (10YR 4/1) loamy sand; weak, fine, granular structure; very friable or loose; many fine roots; strongly acid; abrupt, wavy boundary. 7 to 10 inches thick.

C1—7 to 24 inches, very pale brown (10YR 7/3) sand with a few fine, distinct streaks of brownish yellow (10YR 6/6); single grain; loose; few fine roots; very strongly acid; clear, wavy boundary. 12 to 24 inches thick.

C2—24 to 48 inches +, pale-yellow (2.5Y 7/4) and light-gray (2.5Y 7/2) sand; few, fine, distinct streaks of brownish yellow (10YR 6/6); single grain; loose; very strongly acid.

Range in characteristics.—The surface layer is dark gray or gray, and the lower layers are very pale brown to light yellowish-brown sand or loamy sand. Mottles of gray and brown begin at a depth of 20 to 30 inches.

COXVILLE SERIES

Soils in the Coxville series are classified as Typic Ochraquults. They formed in fine-textured sediments.

In this county Coxville soils are associated with Dunbar, Portsmouth, Rains, McColl, and Plummer soils. Coxville soils are more poorly drained than Dunbar soils and are finer textured than Rains and Plummer soils. They have better drainage than Portsmouth soils, and their dark-colored surface layer is thinner than that of Portsmouth soils. They are less prominently mottled than McColl soils.

Profile of Coxville loam, 1 mile north of Laurinburg, in south end of large bay north of U.S. Highway 401 bypass:

O1—1 to 0 inches, dark-brown, partly decomposed organic material derived from hardwood leaves, pine needles, and twigs.

A1—0 to 7 inches, very dark gray (10YR 3/1) loam; weak, fine, granular structure; very friable when dry, slightly sticky when wet; many, medium and fine, woody roots; very strongly acid; abrupt, smooth boundary. 5 to 8 inches thick.

B2tg—7 to 32 inches, gray (10YR 6/1) clay; few, fine, distinct mottles of brownish yellow (10YR 6/8) and red (2.5YR 4/8); weak, medium, angular blocky structure; firm; sticky and plastic when wet; patchy clay films; common, medium, woody roots; very strongly acid; gradual boundary. 25 to 36 inches thick.

B3g—32 to 48 inches, gray to light-gray (10YR 6/1) sandy clay; few, fine, distinct mottles of red (2.5YR 4/8) and brownish yellow (10YR 6/8); weak, medium, subangular blocky structure; firm; very strongly acid; sticky and plastic when wet.

Cg—48 to 60 inches, light-gray (10YR 7/1) sandy clay; common, medium, distinct mottles of red and strong brown; massive; firm; very strongly acid.

Range in characteristics.—The A horizon is dark gray or very dark gray. In places there is a thin A2 or B1 horizon. The B horizon is gray or light gray in color and ranges from sandy clay to clay in texture. Mottles in the B horizon range from few to common in number and are red, yellowish red, or strong brown in color. The C horizon ranges from clay to sandy clay loam in texture. It has few to common mottles of red, yellowish red, and strong brown.

CRAVEN SERIES

Soils in the Craven series are classified as Typic Paleudults. They formed in fine-textured sediments.

In this county Craven soils are associated with Duplin, Dunbar, Marlboro, and Coxville soils. They are similar to Duplin soils in drainage and position. They have a firmer and finer textured subsoil than Duplin and Marlboro soils. They are less well drained than Marlboro soils but are better drained than Coxville and Dunbar soils. They are finer textured than Dunbar soils.

Profile of Craven sandy loam, 2 to 6 percent slopes, eroded, 2 miles northeast of Laurinburg, half a mile east of U.S. Highway 401:

Ap—0 to 5 inches, grayish-brown (10YR 5/2) sandy loam; weak, medium, granular structure; very friable; few fine roots; strongly acid; clear, wavy boundary. 4 to 8 inches thick.

B21t—5 to 24 inches, light olive-brown (2.5Y 5/4) silty clay; moderate, medium, subangular blocky structure; firm when moist, sticky when wet; very strongly acid; gradual boundary. 12 to 20 inches thick.

B22t—24 to 33 inches, light olive-brown (2.5Y 5/4) clay; common, medium, distinct mottles of strong brown (7.5YR 5/8), yellowish red (5YR 4/8), and gray (10YR 6/1); weak, medium, angular blocky structure; firm when moist, sticky when wet; very strongly acid; gradual boundary. 5 to 14 inches thick.

B23t—33 to 42 inches, light-gray (10YR 7/1) sandy clay to clay; common, medium, distinct mottles of yellowish brown (10YR 5/8) and yellowish red (5YR 5/8); weak, medium, angular blocky structure; firm; very strongly acid.

Cg—42 to 60 inches, light-gray (10YR 7/1) sandy clay; many, medium, distinct mottles of red, yellowish red, strong brown, and yellowish brown; massive; firm; very strongly acid.

Range in characteristics.—An A2 horizon is present in places. The A horizon ranges from gray to dark grayish

brown in color. The Bt horizons are pale brown to yellowish brown in places. The lower part of the B horizon is mottled with gray and strong brown in places and is very firm in some areas. The solum is 40 inches or more thick. The C horizon ranges from sandy clay to clay in texture and in many places is mottled with strong brown, red, and light gray.

DUNBAR SERIES

Soils in the Dunbar series are classified as Aquic Paleudults. They formed in moderately fine textured or fine textured sediments. The Dunbar soils are somewhat poorly drained. They are associated with and are intermediate in drainage between Duplin and Coxville soils. Other associated soils are of the Goldsboro, Lynchburg, Rains, and McColl series. Dunbar soils are finer textured and have a more sticky subsoil than Goldsboro, Lynchburg, and Rains soils. They are better drained than Rains soils but not so well drained as Goldsboro soils. They are less prominently mottled than McColl soils.

Profile of Dunbar fine sandy loam, 1 mile northeast of Elmores Crossroads, 50 feet east of county road:

Ap—0 to 8 inches, dark-gray (10YR 4/1) fine sandy loam; weak, medium, granular structure; very friable; few fine roots; strongly acid; abrupt, wavy boundary. 7 to 12 inches thick.

B1—8 to 12 inches, light olive-brown (2.5Y 5/4) sandy clay loam; weak, medium, subangular blocky structure; friable when moist, sticky when wet; few fine roots; many fine and medium pores; small amount of material from the Ap horizon in old root channels; sheen on cut surfaces; strongly acid; clear, wavy boundary. 3 to 5 inches thick.

B21t—12 to 16 inches, light olive-brown (2.5Y 5/4) sandy clay; weak, medium, subangular blocky structure; common, medium, faint mottles of light yellowish brown (10 YR 6/4); common, coarse, distinct mottles of strong brown (7.5YR 5/8); friable when moist, sticky when wet; sheen on cut surfaces; few fine roots; small amount of material from the Ap horizon in old root channels; very strongly acid; gradual boundary. 5 to 10 inches thick.

B22t—16 to 38 inches, mottled strong-brown (7.5YR 5/6) and gray (10YR 6/1) sandy clay; weak, fine, angular blocky structure; friable when moist, sticky when wet; sheen on cut surfaces; few fine roots; many fine and medium pores; small amount of material from the Ap horizon in old root channels; very strongly acid; gradual boundary. 15 to 22 inches thick.

B3g—38 to 50 inches, gray (10YR 6/1) sandy clay; common, coarse, distinct mottles of strong brown, yellowish brown, and very pale brown; weak, medium, subangular blocky structure; friable when moist, sticky when wet; sheen on cut surfaces; few incipient nodules in center of strong-brown mottles; few fine roots; very strongly acid.

Cg—50 to 60 inches, light-gray (10YR 7/1) sandy clay; many, coarse, prominent mottles of strong brown and yellowish red; massive; friable when moist, sticky when wet; few iron nodules; very strongly acid.

Range in characteristics.—An A2 horizon is present in places. The color of the A horizon ranges from gray to very dark gray. The thickness of the solum is 40 inches or more. The color of the upper part of the subsoil is light olive brown to yellowish brown. Mottles of strong brown and gray occur in places in the upper part of the subsoil and are characteristic of the lower part. In places the consistence of the subsoil is firm. Dunbar soils in Carolina bays have more free iron and redder mottles in their B horizon than Dunbar soils on uplands.

DUPLIN SERIES

Soils in the Duplin series are classified as Typic Paleudults. They formed in moderately fine textured to fine textured sediments.

In this county Duplin soils are associated with Marlboro, Dunbar, Norfolk, Faceville, and Goldsboro soils. They are moderately well drained and are intermediate in drainage between Marlboro and Dunbar soils. Their A horizon is thinner than that of Norfolk and Goldsboro soils, and their B horizon is finer textured and more sticky. In drainage they are similar to Goldsboro soils, but they are less well drained than Norfolk soils. The upper part of the B horizon is similar to that of Marlboro soils, and the lower part is similar to that of Dunbar soils.

Profile of Duplin sandy loam, 2 miles northwest of Laurinburg, 50 feet west of paved road:

Ap—0 to 8 inches, dark grayish-brown (2.5Y 4/2) sandy loam; weak, medium, granular structure; very friable; few fine roots; strongly acid; abrupt, wavy boundary. 7 to 12 inches thick.

B21t—8 to 22 inches, light olive-brown (2.5Y 5/6) sandy clay; weak, medium, subangular blocky structure; friable when moist, sticky when wet; sheen on cut surfaces; few fine roots; many fine and medium pores; small amount of material from the Ap horizon; strongly acid; gradual boundary. 10 to 18 inches thick.

B22t—22 to 32 inches, pale-brown (10YR 6/3) sandy clay; weak, fine to medium, subangular blocky structure; common, medium to coarse, distinct mottles of light brownish gray (10 YR 6/2), strong brown (7.5YR 5/8), and brownish yellow (10 YR 6/8); friable when moist, sticky when wet; sheen on cut surfaces; few fine roots; few patchy clay films; common fine and medium pores; very strongly acid; gradual boundary. 7 to 15 inches thick.

B3—32 to 48 inches, mottled gray (10YR 6/1), strong-brown (7.5YR 5/8), yellowish-red (5YR 4/8), yellowish-brown (10 YR 5/8), and pale-brown (10YR 6/3) light sandy clay; weak, fine, angular blocky structure; friable when moist, slightly sticky when wet; sheen on cut surfaces; few fine and medium pores; few fine roots; few weak, incipient nodules in yellowish-red and strong-brown mottles; very strongly acid; few rounded quartz grains.

Cg—48 to 60 inches, gray (10YR 6/1) light sandy clay; many, coarse, prominent mottles of red, yellowish red, and strong brown; massive; friable when moist, sticky when wet; few iron nodules in red and brown mottles; very strongly acid.

Range in characteristics.—An A2 horizon is present in places. The A horizon ranges from gray to dark grayish brown in color. The B horizon is pale brown, yellowish brown, or light olive brown mottled with gray and strong brown in the lower part. In places the B horizon is firm when dry. The solum is 40 inches or more thick. There are small, rounded concretions of iron in the profile in places. The C horizon ranges from sandy loam to sandy clay in texture. It is prominently mottled with strong brown, red, and light gray.

EUSTIS SERIES

Soils in the Eustis series are classified as Psammentic Hapludults. They formed in coarse-textured sediments.

In this county Eustis soils are associated with Lakeland, Norfolk, and Orangeburg soils. They have a somewhat browner A horizon and redder, slightly finer textured subsurface horizons than Lakeland soils. They are coarser textured than Orangeburg and Norfolk soils, and they are redder than Norfolk soils.

Profile of Eustis sand, 0 to 6 percent slopes, 4½ miles south of Wagram and 50 feet south of county road, in a cultivated field:

Ap—0 to 8 inches, grayish-brown (10YR 5/2) sand; single grain; loose; few fine and medium roots; strongly acid; abrupt, wavy boundary. 7 to 10 inches thick.
A2—8 to 20 inches, pale-brown (10YR 6/3) sand; single grain; loose; strongly acid; abrupt, wavy boundary. 10 to 30 inches thick.
Bt—20 to 40 inches, strong-brown (7.5YR 5/8) loamy sand; very friable; weak, fine, granular structure; very strongly acid; gradual boundary. 10 to 30 inches thick.
C—40 to 60 inches, reddish-yellow (7.5YR 6/6) sand; single grain; loose; very strongly acid.

Range in characteristics.—In places the color of the A horizon is gray or dark gray. The color of the underlying horizons ranges from strong brown to yellowish red. The thickness of the sandy material is more than 40 inches. The texture of the C horizon ranges from sand to sandy loam, and the color ranges from strong brown to red.

FACEVILLE SERIES

Soils in the Faceville series are classified as Typic Paleudults. They formed in moderately fine textured or fine textured sediments.

In this county Faceville soils are associated with Marlboro, Orangeburg, and Norfolk soils. They are similar to Orangeburg soils in color, but they have a thinner A horizon and a finer textured subsoil than those soils. They have a redder subsoil than Marlboro and Norfolk soils, and a finer textured subsoil than Norfolk soils.

Profile of Faceville loamy sand, 2 to 6 percent slopes, eroded, 1¼ miles northwest of Laurinburg, in a cultivated field, 150 feet west of county road:

Ap—0 to 8 inches, brown (10YR 5/3) loamy sand; weak, medium, granular structure; very friable; few fine roots; medium acid; clear, wavy boundary. 4 to 12 inches thick.
B1—8 to 11 inches, strong-brown (7.5YR 5/6) light sandy clay loam; weak, medium, subangular blocky structure; friable; few fine roots; strongly acid; clear, wavy boundary. 0 to 5 inches thick.
B21t—11 to 48 inches, yellowish-red (5YR 4/8) sandy clay; weak, medium, subangular blocky structure; friable or firm when moist, sticky when wet; strongly acid or very strongly acid. 15 to 40 inches thick.
B22t—48 to 60 inches, yellowish-red (5YR 5/6) sandy clay; weak, medium, subangular blocky structure; friable when moist, sticky when wet; few, medium, prominent mottles of brownish yellow (10YR 6/6); few iron nodules; very strongly acid. 8 to 16 inches thick.
B3t—60 to 74 inches, strong-brown (7.5YR 5/8) to yellowish-brown (10YR 5/8) light sandy clay; weak, fine, subangular blocky structure; friable; few iron nodules; very strongly acid. 10 to 24 inches thick.
C—74 to 80 inches +, mottled red, strong-brown, yellowish-brown, and gray sandy clay loam; massive; friable; very strongly acid.

Range in characteristics.—A thin A2 horizon is present in places. The A horizon is grayish brown or dark grayish brown in color. It is thinner and darker colored in eroded areas than in uneroded areas. The B horizon ranges from strong brown to yellowish red in color. It is thinner in areas where the slope is stronger. Its texture ranges from sandy clay to clay loam. The lower part of the B horizon is mottled with brownish yellow and red. Some profiles lack a B1 horizon. There are small, rounded nodules of iron on the surface and throughout the profile in places.

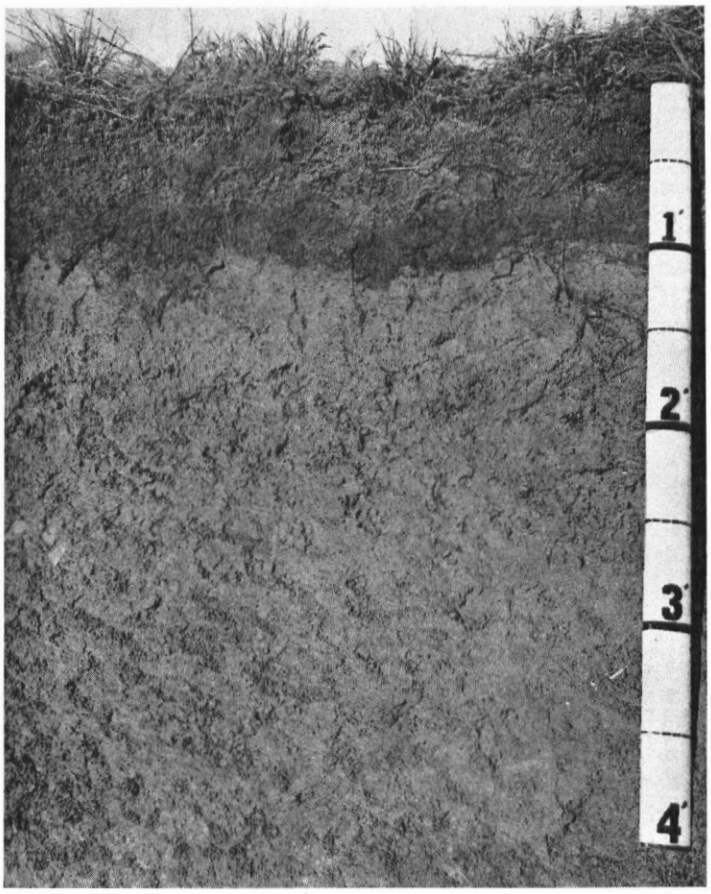

Figure 10.—Profile of Gilead loamy sand.

GILEAD SERIES

Soils in the Gilead series are classified as Typic Hapludults. They formed in moderately fine textured or fine textured sediments. Their C horizon is stratified.

In this county Gilead soils (fig. 10) are associated with Norfolk, Lakeland, Hoffman, Kenansville, and Vaucluse soils. They have a firm, compact, slightly cemented B horizon, which Gilead soils lack, and a generally coarser textured and more leached surface horizon than Gilead soils. They are less reddish in their B horizon than Vaucluse soils, and they are finer textured than Kenansville and Lakeland soils. They have a thicker, more distinct B horizon than Hoffman soils.

Profile of Gilead loamy sand, 2 to 6 percent slopes, three-fourths of a mile north of Wright's store and 2,000 feet east of U.S. Highway 501 in a field beyond county road:

Ap—0 to 7 inches, grayish-brown (2.5Y 5/2) loamy sand; weak, fine, granular structure; very friable; many fine roots; strongly acid; abrupt, smooth boundary. 3 to 10 inches thick.
B21t—7 to 16 inches, light yellowish-brown (2.5Y 6/4) sandy clay loam; weak, medium, subangular blocky structure; firm when moist, sticky and slightly plastic when wet; slightly cemented; distinct clay films on vertical faces of peds; many fine roots; some material from the Ap horizon in root channels; very strongly acid; gradual boundary. 6 to 12 inches thick.

[1] B22ty—16 to 25 inches, pale-brown (10YR 6/3) sandy clay loam; common, medium, distinct mottles of brownish yellow (10YR 6/8); weak, medium, subangular blocky structure; firm; slightly cemented; patchy clay films; common fine roots; very strongly acid; gradual boundary. 6 to 12 inches thick.

[1] B3y—25 to 35 inches, light-gray (2.5Y 7/2) sandy clay loam; common, medium, distinct mottles of brownish yellow (10YR 6/6); weak, medium, subangular blocky structure; firm when moist, sticky and slightly plastic when wet; slightly cemented; very strongly acid; gradual boundary. 3 to 12 inches thick.

C—35 to 60 inches, light-gray (10YR 7/1) sandy clay loam; few, fine, distinct mottles of red (2.5YR 5/8), light yellowish brown (10YR 6/4), and brownish yellow; massive; firm; very strongly acid.

Range in characteristics.—In places there is an A2 horizon of light yellowish-brown loamy sand, 3 to 10 inches thick. In cultivated areas, the Ap horizon ranges from gray to grayish brown in color. The B horizon ranges from light yellowish brown to yellowish brown in color and from sandy clay loam to sandy clay in texture. It is friable in places. Its color is variable, but in most profiles it is mottled with gray, red, and yellow. The C horizon ranges from sandy loam to sandy clay in texture. There are small, rounded pebbles of quartz and fragments of ironstone on the surface and in the profile in places. The soils are thinner in areas where the slope is stronger.

GOLDSBORO SERIES

Soils in the Goldsboro series are classified as Typic Paleudults. They formed in medium-textured or moderately fine textured sediments.

In this county Goldsboro soils are associated with Norfolk, Lynchburg, Marlboro, Duplin, Dunbar, Kenansville, and Gilead soils. They are the moderately well drained members of the Orangeburg-Norfolk-Goldsboro-Lynchburg-Rains-Portsmouth drainage sequence. Goldsboro soils are similar to Duplin soils in drainage and color but are coarser in texture and less sticky in the subsoil. They are better drained and coarser textured than Dunbar soils. They are less well drained than Kenansville soils and have a thicker B horizon. Goldsboro soils do not have so firm or compact a subsoil as Gilead soils, and they are generally smoother and have a higher water table than those soils.

Profile of Goldsboro loamy sand, 1½ miles north of Maxton, 650 feet west of gas pipeline and 25 feet south of airbase boundary road:

Ap—0 to 8 inches, dark-gray (10YR 4/1) loamy sand; weak, fine, granular structure; very friable; abundant, fine and medium, fibrous roots; few pebbles of quartz 5 to 15 millimeters in size on surface; strongly acid; clear, wavy boundary. 6 to 10 inches thick.

A2—8 to 16 inches, light yellowish-brown (2.5Y 6/4) loamy sand; weak, fine, granular structure; very friable; strongly acid; clear, wavy boundary. 3 to 10 inches thick.

B21t—16 to 28 inches, light yellowish-brown (2.5Y 6/4) sandy clay loam; weak, medium, subangular blocky structure; friable; few, fine, distinct, yellowish-brown streaks; few, medium, faint mottles of pale brown (10YR 6/3); few fine roots; very strongly acid; gradual boundary. 6 to 14 inches thick.

B22t—28 to 32 inches, light yellowish-brown (10YR 6/4) sandy clay loam; common, medium, distinct mottles of light brownish gray (2.5Y 6/2) and brownish yellow (10YR 6/6); weak, medium, subangular blocky structure; friable; few fine roots; few coarse grains of quartz; very strongly acid; gradual boundary. 4 to 10 inches thick.

B3—32 to 42 inches, mottled gray (10YR 6/1), brownish-yellow (10YR 6/6), and pale-brown (10YR 6/3) sandy loam; weak, medium, subangular blocky structure; friable; few small pockets of coarse white sand; very strongly acid; gradual boundary. 5 to 12 inches thick.

Cg—42 to 48 inches +, light-gray (10YR 6/1 to 10YR 7/1) coarse sandy clay loam; common, medium, distinct mottles of brownish yellow, pale brown, strong brown, and yellowish red; massive; friable; very strongly acid.

Range in characteristics.—In places the Ap horizon is gray. The A2 horizon ranges from very pale brown to light yellowish brown in color. The B horizon ranges from light olive brown to yellowish brown in color and from sandy loam to sandy clay loam in texture. The lower part is mottled with light brownish gray, gray, and strong brown. The solum is 40 inches or more in thickness.

HOFFMAN SERIES

Soils in the Hoffman series are classified as Entic Hapludults. They are shallow and well drained or somewhat excessively drained. They formed on moderate to steep slopes in fine-textured sediments.

In this county Hoffman soils are associated with Vaucluse, Gilead, and Lakeland soils. They are shallower over a clayey substratum than any of those soils and are more variable in color in the subsurface horizons. Generally, Hoffman soils have a discontinuous layer of ironstone or broken fragments underlying the A horizon. In most places they lack a B horizon. The substratum consists of varicolored, compacted or cemented sand or of kaolinitic clay containing iron concretions in various sizes or having thin, discontinuous layers of ironstone.

Profile of Hoffman loamy sand, 10 to 15 percent slopes, half a mile east of the Richmond County line, 50 feet north of U.S. Highway 74:

Ap—0 to 7 inches, grayish-brown (10YR 5/2) loamy sand; weak, fine, granular structure; very friable; abundant fine roots; few concretions of iron; small amount of material from underlying horizon; strongly acid; clear, wavy boundary. 3 to 10 inches thick.

B—7 to 16 inches, light-gray (10YR 7/2) and pale-brown (10YR 6/3) clay; prismatic structure or massive; very firm; few, fine, distinct, yellowish-red (5YR 5/8) streaks; primary faces have prominent clay films; few fine roots between primary structural aggregates; very strongly acid; gradual boundary. Up to 10 inches thick.

C—16 to 42 inches +, mottled weak-red, strong-brown, brownish-yellow, pale-brown, and light brownish-gray sandy clay; massive; compact and slightly cemented in place; few fragments and concretions of ironstone; very strongly acid.

Range in characteristics.—The A horizon ranges from gray to grayish brown in color. The B horizon, where present, ranges from sandy clay to clay in texture and from pale brown to light gray in color. It is streaked with yellowish red and light yellowish brown. Consistence is firm in places.

JOHNS SERIES

Soils in the Johns series are classified as Aquic Hapludults. They formed in moderately coarse textured to moderately fine textured sediments washed from uplands. These soils are less than 40 inches thick.

[1] The "y" denotes a brittle, compact, panlike horizon.

In this county Johns soils are associated with Kalmia, Maxton, Lumbee, Okenee, Ocilla, and Plummer soils. They are the somewhat poorly drained member of the Maxton-Kalmia-Johns-Lumbee-Okenee drainage sequence. They lack the thick, sandy surface horizon of Ocilla soils. They are better drained than Plummer soils, which are sandy to a depth of 40 to 60 inches.

Profile of Johns loamy sand, 1 mile northwest of Sycamore Hill Church:

Ap—0 to 8 inches, dark-gray (10YR 4/1) loamy sand; weak. medium, granular structure; very friable; many fine roots; strongly acid; abrupt, wavy boundary. 7 to 12 inches thick.

A2—8 to 15 inches, very pale brown (10YR 7/3) loamy sand; weak, medium, granular structure; very friable; slightly compact in place; few fine roots; very strongly acid; clear, wavy boundary. 3 to 10 inches thick.

B21t—15 to 18 inches, light yellowish-brown (2.5Y (6/4) sandy clay loam; few, medium, distinct mottles of strong brown (7.5YR 5/8), brownish yellow (10YR 6/6), and light brownish gray (2.5Y 6/2); weak, medium, subangular blocky structure; friable; few fine roots; very strongly acid; clear, wavy boundary. 3 to 10 inches thick.

B22tg—18 to 28 inches, mottled light-gray (10YR 6/1 to 10YR 7/1), brownish-yellow (10YR 6/8), and strong-brown (7.5YR 5/8) sandy clay loam; color becomes grayer as depth increases; weak, medium, subangular blocky structure; friable; few fine roots; very strongly acid; gradual boundary. 8 to 20 inches thick.

IICg—28 to 42 inches +, light-gray (10YR 7/1) sand mottled with brownish yellow (10YR 6/6); loose; few small pockets of sandy loam and loamy sand; very strongly acid.

Range in characteristics.—The Ap horizon ranges from gray to very dark gray in color, and the A2 horizon ranges from pale yellow to light yellowish brown. In places the texture of the A2 horizon is loamy fine sand. The B horizon ranges from light yellowish brown to light olive brown in color and from sandy loam to heavy sandy clay loam in texture. It is mottled with gray, strong brown, and brownish yellow. Its consistence is friable or firm. The underlying strata consist of sand to sandy loam and contain a small amount of fine, rounded gravel.

JOHNSTON SERIES

Soils in the Johnston series are classified as Cumulic Humaquepts. They formed in moderately coarse textured or medium-textured sediments washed from uplands, in areas where the level of ground water was relatively high. They occur on flood plains and are subject to frequent overflow. They have a thick, black or very dark gray A horizon. Their subsurface horizons are gleyed and contain no illuviated clay.

In this county Johnston soils are associated with Okenee, Rutlege, Plummer, and Lumbee soils. Johnston soils have a thicker A horizon than Okenee soils, but they lack a B horizon, which is present in the Okenee soils. Rutlege and Plummer soils are coarser textured than Johnston soils. Plummer and Lumbee soils are better drained. The Plummer and Lumbee soils lack the thick, black or very dark gray surface horizon of the Johnston soils.

Profile of Johnston mucky loam, 3 miles south of Wagram, 50 feet west of Shoe Heel Creek, 1½ miles north of Lees Pond:

O1—1 inch to 0, partly decomposed leaves and straw. 1 to 3 inches thick.

A11—0 to 30 inches, black (10YR 2/1) mucky loam, high in organic-matter content; very friable; weak, medium, granular structure; abundant medium and coarse roots; water table at a depth of 12 inches; very strongly acid; abrupt, smooth boundary. 20 to 40 inches thick.

A12—30 to 34 inches, dark-gray (10YR 4/1) loamy fine sand; structureless; very strongly acid; abrupt, smooth boundary. 2 to 8 inches thick.

Cg—34 to 50 inches, gray (10YR 5/1) fine sandy loam with pockets of loamy sand; structureless; friable; dark-colored loamy material in old root channels; very strongly acid. 12 to 36 inches thick.

Range in characteristics.—The A11 horizon is black or very dark gray in color. The Cg horizon is stratified, and the rated average of its texture is coarse loamy. It is gray to very dark gray in color. The deeper sediments are generally gray or light gray in color and fine sand or sand in texture.

KALMIA SERIES

Soils in the Kalmia series are classified as Typic Hapludults. They formed in moderately coarse textured to moderately fine textured old alluvial sediments washed from uplands. Their solum is less than 40 inches thick.

In this county Kalmia soils are associated with Maxton, Johns, Lumbee, Lakeland, and Chipley soils. They are well-drained members of the Maxton-Kalmia-Johns-Lumbee-Okenee drainage sequence. They have a B horizon, which Lakeland and Chipley soils lack. Their morphology is similar to that of Maxton soils, but their B horizon is less reddish than that of those soils. Unlike Kalmia soils, Johns and Lumbee soils are not well drained, and they have gleyed mottles or gleyed matrix colors in their B horizon. Kalmia soils resemble Norfolk soils, but they are thinner and have a stratified, coarse-textured C horizon.

Profile of Kalmia loamy sand, 0 to 2 percent slopes, three-eighths of a mile east of Laurinburg-Maxton Airbase hangars, 20 feet south of farm road:

Ap—0 to 8 inches, grayish-brown (10YR 5/2) loamy sand; weak, medium, granular structure; very friable; few fine roots; strongly acid; abrupt, wavy boundary. 6 to 10 inches thick.

A2—8 to 12 inches, light yellowish-brown (2.5Y 6/4) loamy sand; weak, medium, granular structure; very friable; strongly acid; clear, wavy boundary. 3 to 10 inches thick.

B1—12 to 14 inches, brownish-yellow (10YR 6/6) sandy loam; weak, medium, subangular blocky structure; friable; few fine roots; strongly acid; clear, wavy boundary. 2 to 5 inches thick.

B2t—14 to 27 inches, brownish-yellow (10YR 6/6) fine sandy clay loam; weak, medium, subangular blocky structure; friable; abundant, fine and medium, fibrous roots; small amount of fine mica; few clay films; few small pebbles of quartz; few fine and medium pores; small amount of material from the Ap horizon; very strongly acid; gradual boundary. 12 to 24 inches thick.

B3—27 to 32 inches, brownish-yellow (10YR 6/6) light sandy clay loam to sandy loam, common, medium, distinct mottles of strong brown (7.5YR 5/8) and common, medium, faint mottles of pale brown (10YR 6/3); weak, medium, subangular blocky structure; friable; few fine roots; few small pebbles of quartz; pockets of loamy sand; very strongly acid; gradual boundary. 6 to 12 inches thick.

IIC—32 inches +, light yellowish-brown, pale brown, and very pale brown loamy sand streaked with strong brown; single grain; friable to loose; grades into sand and fine gravel; very strongly acid.

Range in characteristics.—The Ap horizon ranges from gray to dark grayish brown in color, and the A2 horizon ranges from pale yellow to light yellowish brown. The B horizon ranges from fine sandy loam to sandy clay loam in texture and from brownish yellow to strong brown in color. In places the B3 horizon contains mottles of strong brown and light brownish gray. The underlying strata range from loamy sand to sand and gravel.

KENANSVILLE SERIES

Soils in the Kenansville series are classified as Arenic Hapludults. They formed in moderately coarse textured sediments. They have a substratum of sand or loamy sand at a depth of 30 to 42 inches.

In this county Kenansville soils (fig. 11) are associated with Norfolk, Wagram, Gilead, Blaney, Lakeland, Eustis, Chipley, and Plummer soils. They have a finer textured subsoil than Lakeland and Eustis soils and a thinner, coarser textured subsoil than Norfolk and Gilead soils. They are thinner than Wagram and Blaney soils, but their A horizon is similar to that of those soils. Their B horizon is coarser textured than that of Wagram and Blaney soils. They are finer textured and better drained than Chipley and Plummer soils.

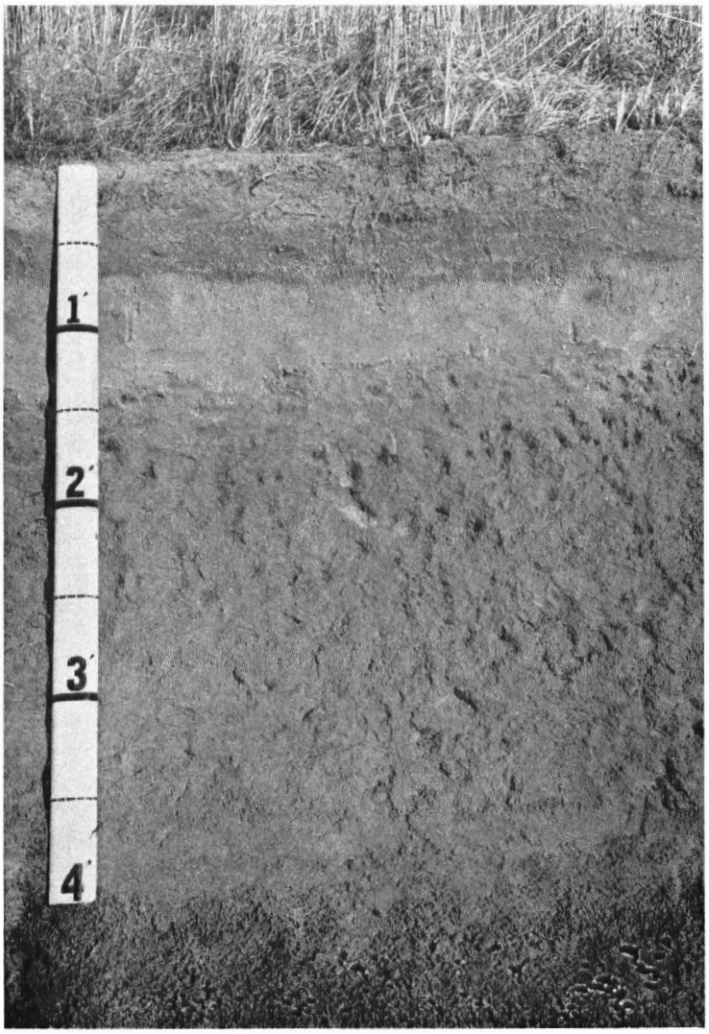

Figure 11.—Profile of Kenansville loamy sand.

Profile of Kenansville loamy sand, 0 to 2 percent slopes, 4 miles south of Wagram, 50 feet west of county road, in a cultivated field:

Ap—0 to 8 inches, dark-gray (10YR 4/1) loamy sand; weak, fine, granular structure; very friable; few fine roots; strongly acid; clear, wavy boundary. 6 to 10 inches thick.

A2—8 to 22 inches, light yellowish-brown (10YR 6/4) loamy sand; weak, fine, granular structure; very friable; few fine roots; strongly acid; clear, wavy boundary. 12 to 20 inches thick.

B2t—22 to 36 inches, yellowish-brown (10YR 5/8) sandy loam; moderate, medium, granular structure; very friable; few fine roots; very strongly acid; gradual boundary. 12 to 24 inches thick.

C—36 to 50 inches, brownish-yellow (10YR 6/6) loamy sand; weak, medium, granular structure; very friable; grades to loose sand at a depth of 40 inches; very strongly acid.

Range in characteristics.—The Ap horizon ranges from gray to dark grayish brown in color, and the A2 horizon ranges from pale brown to light yellowish brown. The A horizon ranges from 20 to 30 inches in thickness. The B horizon ranges from brownish yellow to strong brown in color. In places the underlying material is sand.

LAKELAND SERIES

Soils in the Lakeland series are classified as Typic Quartzipsamments. They formed in coarse-textured sediments.

In this county Lakeland soils (fig. 12) are associated with Norfolk, Eustis, Chipley, Gilead, Vaucluse, and Hoffman soils. They are the somewhat excessively drained members of the Eustis-Lakeland-Chipley-Plummer-Rutledge drainage sequence. They have a paler surface horizon and yellower, slightly coarser textured subsurface horizons than Eustis soils. They are better drained than Chipley soils. Lakeland soils lack the B horizon that is characteristic of Gilead and Vaucluse soils.

Profile of Lakeland sand, 0 to 10 percent slopes, 200 yards north of crossroads at Wright's Cemetery and 25 feet west of paved county road, in a wooded area:

A1—0 to 2 inches, dark-gray (10YR 4/1) sand; single grain; loose; abundant woody roots; strongly acid; abrupt, wavy boundary. 2 to 4 inches thick.

C1—2 to 20 inches, light yellowish-brown (10YR 6/4) sand; single grain; loose; few to many woody roots; very strongly acid; gradual boundary. 15 to 30 inches thick.

C2—20 to 44 inches, yellowish-brown (10YR 5/6) sand; single grain; loose; few woody roots; very strongly acid; gradual boundary. 18 inches to several feet in thickness.

C3—44 to 60 inches, very pale brown (10YR 8/4 to 10YR 7/4) sand; single grain; loose; very strongly acid. Several feet thick.

Range in characteristics.—The color of the surface horizon ranges from dark gray to grayish brown. An Ap horizon, 7 to 9 inches thick, is present in places. The color of the underlying horizons ranges from pale yellow to strong brown. The sandy horizons are 40 inches or more in thickness. The horizons underlying the sand range from sandy loam to sandy clay in texture and from brownish yellow to red in color.

LUMBEE SERIES

Soils in the Lumbee series are classified as Typic Ochraquults. They formed in moderately coarse textured to moderately fine textured old alluvial sediments washed

from the uplands. They occur in nearly level areas and are subject to flooding during periods of heavy rainfall.

In this county Lumbee soils are associated with Johns, Kalmia, Maxton, Okenee, and Rutlege soils. They are the poorly drained members of the Maxton-Kalmia-Johns-Lumbee-Okenee drainage sequence. Lumbee soils resemble Rains soils but are thinner than those soils and have a stratified, coarse-textured C horizon. They have a B horizon, which Rutlege soils lack.

Profile of Lumbee loamy sand, half a mile east of Laurinburg-Maxton Airbase hangars, 25 feet north of farm road in a wooded area:

A1—0 to 6 inches, dark-gray (10YR 4/1) loamy sand; weak, fine, granular structure; very friable; many, fine to coarse, woody roots; very strongly acid; clear, wavy boundary. 3 to 8 inches thick.

A2—6 to 14 inches, light brownish-gray (2.5Y 6/2) loamy sand; weak, fine, granular structure; very friable; few, fine and medium, woody roots; very strongly acid; clear, wavy boundary. 2 to 12 inches thick.

B2tg—14 to 30 inches, light-gray (10YR 7/1) heavy sandy clay loam; common, fine, distinct, brownish-yellow (10YR 6/6) mottles; weak, medium, subangular blocky structure; friable or firm; few, fine to medium, woody roots; few small pebbles of quartz; few fine and medium pores; very strongly acid; gradual boundary. 12 to 30 inches thick.

B3g—30 to 36 inches, light-gray (10YR 7/1) sandy clay loam to sandy loam; weak, medium, subangular blocky structure; friable; few small pebbles of quartz; few, fine, woody roots; very strongly acid; gradual boundary. 4 to 10 inches thick.

IICg—36 to 42 inches +, light-gray (10YR 7/1) loamy sand; common, medium, distinct mottles of very pale brown (10YR 7/4) and brownish yellow (10YR 6/6); many small pebbles of quartz; grades into coarse sand and gravel; very strongly acid.

Range in characteristics.—In places the A1 horizon is very dark gray. The A2 horizon is light gray to dark gray in color and ranges from loamy sand to fine sandy loam in texture. The subsoil is gray or light gray in color and sandy loam to heavy sandy clay loam in texture. It is mottled in places with strong brown to brownish yellow. In places the substrata consist of gray or light-gray sand and loamy sand with varying amounts of fine gravel.

LYNCHBURG SERIES

Soils in the Lynchburg series are classified as Aquic Paleudults. They formed in medium-textured or moderately fine textured sediments.

In this county Lynchburg soils are associated with Goldsboro, Rains, Plummer, Chipley, Duplin, Dunbar, Coxville, McColl, and Ocilla soils. They are the somewhat poorly drained members of the Norfolk-Goldsboro-Lynchburgh-Rains-Portsmouth drainage sequence. Lynchburg soils have a B horizon, which Chipley soils lack. They are better drained than Plummer soils and are coarser textured than Duplin, Dunbar, and Coxville soils. They are more poorly drained than Duplin soils but better drained than Coxville soils. They are similar in drainage and color to Dunbar soils but are sandier throughout the solum than those soils and are less sticky in the subsoil. Lynchburg soils are coarser textured than McColl soils and are less grayish in the upper part of the B horizon. They lack the strong-brown mottles that are abundant in the middle and lower parts of the B horizon of the McColl soils. Ocilla soils have a sandy surface horizon 20 to 30 inches thick.

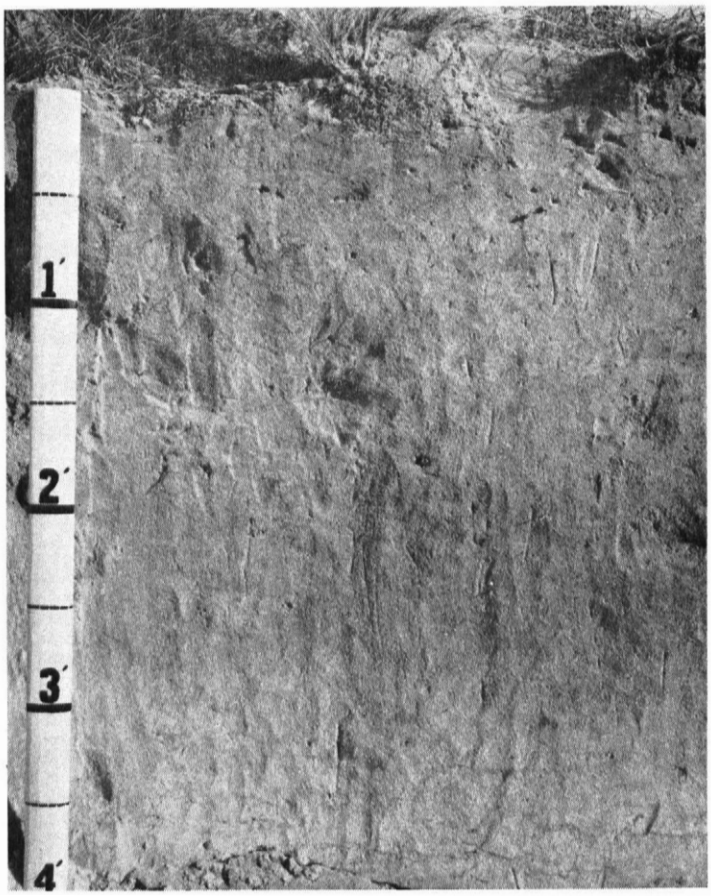

Figure 12.—Profile of Lakeland sand.

Profile of Lynchburg loamy sand, three-fourths of a mile west of Oak Grove school, 300 feet south of county road and 60 feet west of farm road:

Ap—0 to 7 inches, dark-gray (10YR 4/1) loamy sand; weak, medium, granular structure; very friable; abundant, fine and medium, fibrous roots; very strongly acid; abrupt, wavy boundary. 7 to 10 inches thick.

B1—7 to 13 inches, light olive-brown (2.5Y 5/6) sandy loam; weak, medium, subangular blocky structure; friable; many fine roots; few medium-sized pores; few small, rounded pebbles of quartz; small amounts of material from the Ap horizon in old root channels; very strongly acid; clear, wavy boundary. 5 to 10 inches thick.

B2t—13 to 30 inches, pale-brown (10YR 6/3) sandy clay loam; common, medium, distinct mottles of strong brown (7.5Y 5/8), yellowish brown (10YR 5/8), yellowish red (5YR 5/8), and light brownish gray (10YR 6/2); weak, medium, subangular blocky structure; friable; few fine and medium roots; small amount of material from the Ap horizon in old root channels; weak, incipient nodules in some of the strong-brown and yellowish-red mottles; very strongly acid; gradual boundary. 15 to 25 inches thick.

B3g—30 to 42 inches, mottled light-gray, light brownish-gray, pale-brown, yellowish-brown, and strong-brown sandy clay loam; weak, fine, subangular blocky structure; friable; few medium or large pores; very strongly acid; gradual boundary. 8 to 13 inches thick.

Cg—42 to 48 inches +, mottled gray, yellowish-brown, and red sandy clay loam; massive; friable; very strongly acid.

Range in characteristics.—The color of the surface horizon ranges from gray to very dark gray. The sandy surface horizons are as much as 20 inches thick. An A2 horizon of grayish-brown to light yellowish-brown loamy sand, 3 to 10 inches thick, is present in many places. The subsoil is pale-brown to light olive-brown sandy loam to sandy clay loam mottled with gray, strong brown, yellowish brown, and yellowish red. The thickness of the solum is more than 40 inches.

MANTACHIE SERIES

Soils in the Mantachie series are classified as Aeric Fluventic Haplaquepts. They formed in sandy local alluvium.

In this county Mantachie soils are associated with Norfolk, Goldsboro, Marlboro, and Wagram soils. All of the associated soils are better drained than Mantachie soils. Mantachie soils are also associated with and are similar to Bibb soils, but they are better drained than those soils.

Profile of Mantachie soils, local alluvium, half a mile northwest of Johns, 350 feet south of county road:

A—0 to 16 inches, grayish-brown (10YR 5/2) loamy sand; weak, fine, granular structure; very friable; pockets of dark-colored loam; strongly acid; clear, smooth boundary. 12 to 36 inches thick.

A1b—16 to 22 inches, very dark gray (10YR 3/1) sandy loam; weak, medium, granular structure; very friable; very strongly acid; clear, wavy boundary. 3 to 8 inches thick.

Bb—22 to 42 inches +, light yellowish-brown (2.5Y 6/4) light sandy clay loam; common medium mottles of light gray (10YR 7/2) and strong brown (7.5YR 5/6); massive; friable; pockets and lenses of both coarser textured and finer textured material; very strongly acid.

Range in characteristics.—The color of the A horizon ranges from gray to very dark gray. The B horizon ranges from sandy loam to sandy clay loam in texture and from pale brown to light olive brown in color. Gray and brown mottles, ranging from few to many in number, occur in the uppermost 10 inches of the B horizon.

MARLBORO SERIES

Soils in the Marlboro series are classified as Typic Paleudults. They formed in moderately fine textured or fine textured sediments. Their C horizon is stratified.

In this county Marlboro soils are associated with Duplin, Dunbar, Norfolk, Faceville, Orangeburg, and Craven soils. They are better drained than Duplin and Dunbar soils. They are less sandy than Norfolk and Orangeburg soils and have a thinner A horizon and a finer textured, more sticky Bt horizon. They are coarser textured and better drained than Craven soils. Marlboro soils are less reddish in their B horizon than Faceville and Orangeburg soils and are finer textured in their Bt horizons than Orangeburg soils.

Profile of Marlboro loamy sand, 0 to 2 percent slopes, 1 mile south of St. Andrews College, 200 feet north of powerline and 25 feet west of farm road:

Ap—0 to 8 inches, grayish-brown (2.5Y 5/2) loamy sand; weak, medium, granular structure; very friable; many, fine and medium, fibrous roots; strongly acid; abrupt, smooth boundary. 4 to 12 inches thick.

B21t—8 to 20 inches, yellowish-brown (10YR 5/6) sandy clay; weak, medium, subangular blocky structure; friable when moist, sticky when wet; sheen on cut surfaces; many fine and medium roots and pores; small amount of material from the Ap horizon in old root channels; strongly acid. 8 to 15 inches thick.

B22t—20 to 33 inches, yellowish-brown (10YR 5/8) sandy clay; weak, fine or medium, subangular blocky structure; friable when moist, sticky when wet; common, medium, distinct mottles of strong brown (7.5YR 5/8); few fine roots and pores; sheen on cut surfaces; very strongly acid; gradual boundary. 10 to 18 inches thick.

B31t—33 to 38 inches, light yellowish-brown (10YR 6/4) sandy clay; many, coarse, distinct mottles of red (2.5YR 4/8), yellowish red (5YR 5/8), and strong brown 7.5YR 5/8); weak, fine subangular blocky structure; friable when moist, slightly sticky when wet; few fine roots; many fine pores; few grains of white sand in old root channels; very strongly acid; gradual boundary. 4 to 10 inches thick.

B32t—38 to 48 inches, mottled red, yellowish-red, strong-brown, and gray sandy clay loam; weak, fine, angular blocky structure; friable when moist, slightly sticky when wet; very strongly acid. 8 to 20 inches thick.

C—48 to 60 inches, mottled brownish-yellow, strong-brown, yellowish-red, and gray sandy clay loam; friable; massive; few iron nodules; very strongly acid.

Range in characteristics.—In eroded areas the Ap horizon is thinner and darker in color than that of the representative profile. In cultivated areas the Ap horizon is gray to dark grayish brown. In places a thin A2 horizon is present. The B horizon ranges from brownish yellow to strong brown in color. The thickness of the solum is more than 40 inches. The consistence is firm in places. The C horizon ranges from sandy loam to sandy clay in texture. This horizon is variable in color; in most profiles it is mottled with strong brown, red, and light gray.

McCOLL SERIES

Soils in the McColl series are classified as Plinthic Ochraquults. They formed in moderately fine textured or fine textured sediments in upland Carolina bays. They are somewhat poorly drained or poorly drained.

In this county McColl soils are associated with Lynchburg, Rains, Dunbar, Coxville, and Portsmouth soils. Their A horizon is finer textured than that of Lynchburg soils, and they are grayer and finer textured in the upper part of their B horizon than those soils. Also, they have more strong-brown color in the middle and lower parts of their B horizon than Lynchburg soils. Their A2 horizon, where present, is only weakly developed; Lynchburg soils, on the other hand, have a developed A2 horizon in many places. The upper part of the B horizon of McColl soils is grayer than that of Dunbar soils, and the middle and lower parts of the B horizon are browner. McColl soils have more strong brown and yellowish brown in the middle and lower parts of their B horizon than Rains and Coxville soils. They are better drained than Portsmouth soils, and their dark-colored surface horizon is thinner than that of those soils.

Profile of McColl loam, 1 mile northeast of Gibson and one-fourth of a mile west of school, in a cultivated field:

Ap—0 to 8 inches, very dark gray (10YR 3/1) loam; weak, medium, granular structure; very friable; slightly sticky when wet; many fine roots; very strongly acid; clear, wavy boundary. 5 to 10 inches thick.

B21tg—8 to 13 inches, gray (10YR 6/1) clay; few, fine, distinct, brownish-yellow (10YR 6/6) mottles; weak, medium, subangular blocky structure; firm when moist, sticky when wet; slightly plastic; few root channels filled with dark-gray material from the Ap horizon; very strongly acid; gradual boundary. 2 to 12 inches thick.

B22t—13 to 30 inches, strong-brown (7.5YR 5/8) sandy clay loam to sandy clay; many, coarse, prominent mottles of gray (10YR 6/1); common, medium, distinct mottles of yellowish red (5YR 5/6) and yellowish brown (10YR 5/8); weak, medium, subangular blocky structure; firm or friable when moist, sticky and slightly plastic when wet; gray color is in nearly vertical pattern; redder aggregates are brittle and firm; very strongly acid; gradual boundary. 15 to 36 inches thick.

B3g—30 to 55 inches, light-gray (10YR 7/1) sandy clay loam; common, medium, distinct, reddish-yellow (7.5YR 6/6) mottles; weak, platy structure or massive; friable or firm when moist, slightly sticky and slightly plastic when wet; very strongly acid; gradual boundary.

C—55 to 66 inches, gray, yellow, and red loamy sand; loose; structureless; very strongly acid.

Range in characteristics.—The A horizon ranges from gray to very dark gray in color. The upper part of the B horizon is gray or light gray and ranges from sandy clay to clay in texture. There are a few brownish-yellow mottles in places. The lower part of the B horizon is highly mottled with strong brown, brownish yellow, yellowish red, and gray. The texture of this part ranges from sandy clay loam to sandy clay. In places the matrix color is strong brown. The thickness of the solum is more than 40 inches. There are weak, incipient nodules of iron in some of the yellowish-red and strong-brown mottles in the lower part of the B horizon, and this part of the solum has some of the characteristics of a fragipan. The substratum is stratified. Its color varies, and its texture ranges from sand to clay.

MAXTON SERIES

Soils in the Maxton series are classified as Typic Hapludults. They formed in moderately coarse textured to moderately fine textured old alluvial sediments washed from uplands.

In this county Maxton soils are associated with Kalmia, Johns, Lumbee, Lakeland, and Chipley soils. They are the well-drained members of the Maxton-Kalmia-Johns-Lumbee-Okenee drainage sequence. They have a B horizon, which Lakeland and Chipley soils lack. They are better drained than Chipley soils. They have a redder B horizon and a browner surface horizon than Kalmia soils. They resemble Orangeburg soils, but they are thinner than those soils and have a stratified, coarse-textured C horizon.

Profile of Maxton loamy sand, 50 feet northwest of Sycamore Hill Cemetery, in the southeastern corner of Scotland County:

Ap—0 to 8 inches, grayish-brown (10YR 5/2) loamy sand; weak, medium, granular structure; very friable; few fine roots; strongly acid; clear, wavy boundary. 6 to 10 inches thick.

A2—8 to 12 inches, pale-brown (10YR 6/3) loamy sand; weak, medium, granular structure; very friable; slightly compact in place; few fine roots; small amount of material from the Ap horizon; strongly acid; clear, wavy boundary. 2 to 10 inches thick.

B1—12 to 15 inches, brown (7.5YR 5/4) sandy clay loam; weak, medium, subangular blocky structure; friable; few fine roots; small amount of material from the Ap and A2 horizons in old root channels; strongly acid; clear, wavy boundary. Up to 6 inches thick.

B2t—15 to 33 inches, yellowish-red (5YR 4/6 to 5YR 5/6) sandy clay loam; moderate, medium, subangular blocky structure; friable when moist, sticky when wet; common prominent clay films; few fine mica flakes; very strongly acid; few fine roots; gradual boundary. 12 to 30 inches thick.

B3—33 to 39 inches, yellowish-red (5YR 5/6) light sandy clay loam, grading into sandy loam; weak, medium, subangular blocky structure; friable; few fine roots; very strongly acid; gradual boundary. Up to 10 inches thick.

IIC—39 to 50 inches, reddish-yellow (7.5YR 6/6) sand and sandy loam with few, distinct, coarse, strong-brown (7.5YR 5/6) mottles; loose; few small, rounded pebbles of quartz; sand becomes lighter in color and coarser in texture as depth increases; small pebbles increase in number with depth; very strongly acid.

Range in characteristics.—The color of the A horizon ranges from light brownish gray to dark grayish brown. The A2 horizon ranges from pale brown to light yellowish brown in color. The B horizon ranges from strong brown to yellowish red in color and from sandy loam to sandy clay loam in texture. The underlying strata range from loamy sand to sand in texture. They contain fine gravel.

NORFOLK SERIES

Soils in the Norfolk series are classified as Typic Paleudults. They formed in moderately coarse textured to moderately fine textured sediments.

In this county Norfolk soils (fig. 13) are associated with Orangeburg, Kenansville, Lakeland, Marlboro, Goldsboro, Lynchburg, Rains, and Gilead soils. They are the well-drained members of the Orangeburg-Norfolk-Goldsboro-Lynchburg-Rains-Portsmouth drainage sequence. They have a B horizon, which Lakeland soils lack. Norfolk

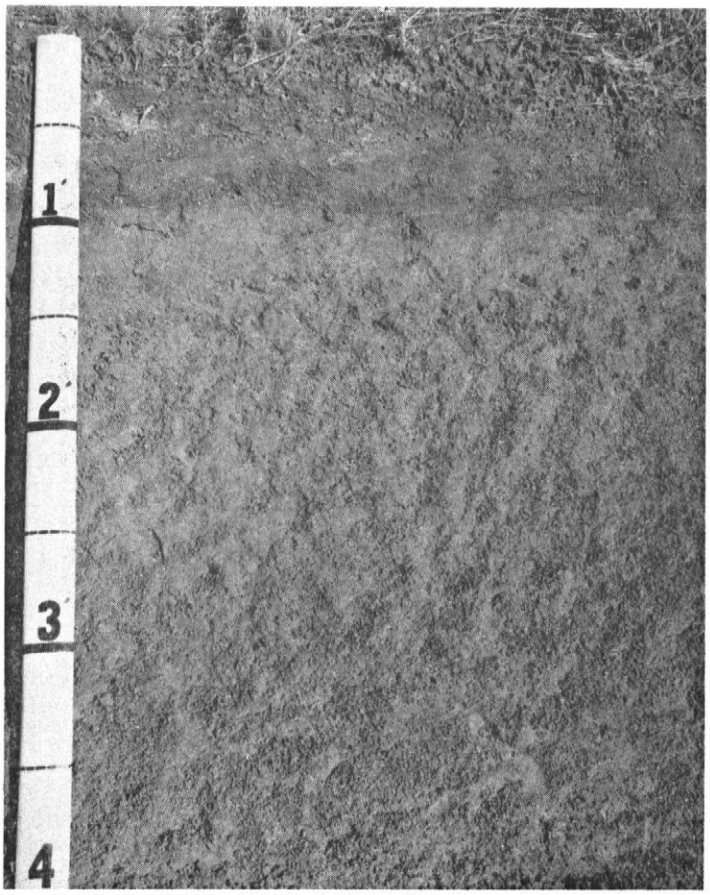

***Figure 13.*—Profile of Norfolk loamy sand.**

soils have a thicker A horizon and a sandier B horizon than Marlboro soils. They have a thicker and, in most places, a finer textured B horizon than Kenansville soils. They are similar to Gilead soils but lack firmness and cementation in the B horizon. Norfolk soils are stronger in color throughout than Gilead soils and are generally deeper.

Profile of Norfolk loamy sand, 0 to 2 percent slopes, three-fourths of a mile west of Sneads Grove, 50 feet south of Laurel Hill road:

Ap—0 to 8 inches, grayish-brown (10YR 5/2) loamy sand; weak, fine, granular structure; very friable; common fine roots; strongly acid; clear, wavy boundary. 4 to 12 inches thick.

A2—8 to 15 inches, pale-brown (10YR 6/3) loamy sand; weak, fine, granular structure; very friable; slightly compact when dry; strongly acid; clear, wavy boundary. 4 to 10 inches thick.

B1—15 to 18 inches, light yellowish-brown (10YR 6/4) sandy loam; weak, medium, subangular blocky structure; friable; slightly compact in place; few fine roots; many medium and coarse pores; few iron nodules 5 to 10 millimeters in size; strongly acid; clear, wavy boundary. 2 to 5 inches thick.

B2t—18 to 54 inches, yellowish-brown (10YR 5/6) sandy clay loam; weak, medium, subangular blocky structure; friable; many medium and large pores; few fine roots; few, medium, distinct, strong-brown (7.5YR 5/8) mottles and a few incipient iron nodules 5 to 10 millimeters in size below a depth of 30 inches; very strongly acid; gradual boundary. 24 to 48 inches thick.

B3—54 to 62 inches, yellowish-brown (10YR 5/8) sandy clay loam; common, medium to coarse, distinct, strong-brown (7.5YR 5/8) and yellowish-red (5YR 5/6) mottles; weak, medium, subangular blocky structure; friable; few incipient iron nodules 5 to 10 millimeters in size; very strongly acid.

C—62 to 72 inches +, mottled yellowish-brown, strong-brown, yellowish-red, and gray light sandy clay loam; massive; friable; very strongly acid.

Range in characteristics.—The Ap horizon ranges from gray to dark grayish brown in color, and the A2 horizon ranges from pale yellow to pale brown. The B horizon ranges from sandy loam to sandy clay loam in texture and from brownish yellow to strong brown in color. The thickness of the solum is more than 40 inches. Distinct mottles of yellowish red and strong brown are common in the lower part of the B horizon.

OCILLA SERIES

Soils in the Ocilla series are classified as Aquic Arenic Paleudults. They formed in moderately coarse textured to moderately fine textured sediments. They have a thick, coarse-textured A horizon and a moderately fine textured B horizon.

In this county Ocilla soils are associated with Chipley, Plummer, Wagram, Lynchburg, Rains, Johns, and Lakeland soils. They are also associated with Norfolk, Marlboro, Goldsboro, and Maxton soils, but they are more poorly drained than those soils, and they have a thicker A horizon. Ocilla soils have a B horizon within 20 to 30 inches of the surface, which Chipley and Lakeland soils lack. They have a thicker A horizon than Lynchburg, Johns, and Rains soils. They are better drained than Rains soils but more poorly drained than Wagram soils.

Profile of Ocilla loamy sand, half a mile south of Wright's Cemetery, in a cultivated field:

Ap—0 to 7 inches, dark-gray (10YR 4/1) loamy sand; weak, fine to medium, granular structure; very friable; many fine to medium, fibrous roots; strongly acid; abrupt, wavy boundary. 6 to 10 inches thick.

A2—7 to 22 inches, very pale brown (10YR 7/3) loamy sand; weak, fine, granular structure; very friable; very strongly acid; clear, wavy boundary. 12 to 30 inches thick.

B21t—22 to 28 inches, light yellowish-brown (2.5Y 6/4) sandy clay loam; weak, medium, subangular blocky structure; friable; very strongly acid; gradual boundary. 4 to 10 inches thick.

B22t—28 to 36 inches, light yellowish-brown (2.5Y 6/4) sandy clay loam; common, medium, distinct mottles of brownish yellow (10YR 6/6), strong brown (7.5YR 5/8), and light brownish gray (10YR 6/2); weak, medium, subangular blocky structure; friable; very strongly acid; gradual boundary. 6 to 12 inches thick.

B3—36 to 44 inches, mottled light yellowish-brown (2.5Y 6/4), light brownish-gray (2.5Y 6/2), brownish-yellow (10YR 6/6), and strong-brown (7.5YR 5/6) light sandy clay loam; weak, medium, subangular blocky structure; friable; very strongly acid; gradual boundary. 6 to 12 inches thick.

Cg—44 to 50 inches +, light-gray (10YR 7/1) sandy clay loam; many, coarse, distinct mottles of yellowish brown (10YR 5/6), strong brown (7.5YR 5/8), red (2.5YR 4/8), and light yellowish brown (2.5YR 6/4); massive; friable; very strongly acid.

Range in characteristics.—An A1 horizon is present in places. The A1 and Ap horizons range from gray to very dark gray in color. The A2 horizon ranges from grayish brown to light yellowish brown in color. The thickness of the A horizon ranges from 20 to 30 inches. The B horizon ranges from heavy sandy loam to sandy clay loam in texture and from pale brown to light olive brown mottled with gray, strong brown, and yellowish red in color. It is 20 inches or more thick.

OKENEE SERIES

Soils in the Okenee series are classified as Typic Umbraquults. They formed in moderately coarse textured to moderately fine textured old alluvial sediments washed from uplands. They occur in nearly level areas or in depressions near uplands and receive considerable seepage water. Their horizons are poorly developed.

In this county Okenee soils are associated with Lumbee, Johns, Kalmia, Maxton, Plummer, Rutledge, and Johnston soils. They are the very poorly drained members of the Maxton-Kalmia-Johns-Lumbee-Okenee drainage sequence. They have a B horizon, which Rutledge and Johnston soils lack. They have a thick, black or very dark gray surface layer, which is lacking in Plummer soils. Okenee soils resemble Portsmouth soils, but they are thinner and have a stratified, coarse-textured C horizon.

Profile of Okenee loam, 3½ miles south of Wagram, 150 yards southwest of silo:

A1—0 to 11 inches, black (N 2/0) loam; moderate, medium, granular structure; very friable; high in organic-matter content; abundant, fine and medium, fibrous roots; very strongly acid; clear, wavy boundary. 8 to 20 inches thick.

A2g—11 to 16 inches, very dark gray (10YR 3/1) sandy loam; weak, medium, granular structure; very friable; many, fine and medium, fibrous roots; very strongly acid. 3 to 8 inches thick.

B2tg—16 to 28 inches, gray or light-gray (10YR 6/1) sandy clay loam; weak, medium, subangular blocky structure; friable; material from Ap horizon in old root channels; few fine roots; few, fine, distinct mottles of strong brown (7.5YR 5/8) around old root channels;

very strongly acid; gradual boundary. 12 to 30 inches thick.

IICg—28 to 42 inches +, gray or light-gray, loose sand; a little fine gravel.

Range in characteristics.—The A1 horizon ranges from black to very dark gray in color. In wooded areas there is an O1 horizon consisting of partly decomposed litter. The B horizon ranges from light-gray to dark-gray, friable to firm sandy loam to sandy clay loam. Where mottles occur in the B horizon they range from few to common in number. They are medium in size, are prominent, and range in color from brownish yellow to strong brown. The substratum is gray or light-gray sand and has varying amounts of fine gravel at a depth of 3 to 4 feet.

ORANGEBURG SERIES

Soils in the Orangeburg series are classified as Typic Paleudults. They formed in moderately coarse textured to moderately fine textured sediments.

In this county Orangeburg soils are associated with Norfolk, Marlboro, Faceville, Vaucluse, and Lakeland soils. They are the well-drained members of the Orangeburg-Norfolk-Goldsboro-Lynchburg-Rains-Portsmouth drainage sequence. They have a browner surface horizon and a redder B horizon than Norfolk and Marlboro soils. They have a B horizon, which Lakeland soils lack. Orangeburg soils have a thicker A horizon and a sandier Bt horizon than Faceville soils. Their Bt horizon is thicker than that of Vaucluse soils, and their B horizon lacks the firmness and cementation characteristics of those soils.

Profile of Orangeburg loamy sand, 2 to 6 percent slopes, eroded, 1 mile east of McNair Research Greenhouse, 100 feet east of crossroads and 50 feet north of county road:

Ap—0 to 5 inches, brown (10YR 5/3) loamy sand; weak, medium, granular structure; very friable; common, medium and fine, fibrous roots; strongly acid; clear, wavy boundary. 4 to 10 inches thick.

A2—5 to 10 inches, yellowish-brown (10YR 5/4) loamy sand; weak, medium, granular structure; very friable; few fine roots; strongly acid; clear, wavy boundary. 2 to 9 inches thick.

B1—10 to 12 inches, strong-brown (7.5YR 5/6) sandy loam; weak, medium, subangular blocky structure; friable; few fine roots; strongly acid; clear, wavy boundary. 2 to 5 inches thick.

B21t—12 to 30 inches, yellowish-red (5YR 4/8) sandy clay loam; weak, medium, subangular blocky structure; friable; few fine roots; strongly acid; gradual boundary. 15 to 30 inches thick.

B22t—30 to 48 inches, yellowish-red (5YR 5/8) sandy clay loam; weak, medium, subangular blocky structure; friable; few fine roots; very strongly acid. 12 to 24 inches thick.

B3t—48 to 60 inches, yellowish-red (5YR 5/6) sandy clay loam; common, distinct mottles of red, strong brown, and yellowish brown; weak, fine, subangular blocky structure; friable; few iron nodules; very strongly acid. 8 to 15 inches thick.

C—60 to 72 inches, yellowish-red (5YR 5/6) to red (2.5YR 4/8) sandy clay loam; common, medium, distinct mottles of strong brown and yellowish brown; massive; friable; few iron concretions; very strongly acid.

Range in characteristics.—The Ap horizon ranges from light brownish gray to dark grayish brown in color, and the A2 horizon ranges from very pale brown to yellowish brown. The B horizon ranges from sandy loam to sandy clay loam in texture and from strong brown to red in color. The solum is more than 40 inches thick. Distinct mottles of yellowish brown are common in the lower part of the B horizon.

PLUMMER SERIES

Soils in the Plummer series are classified as Grossarenic Ochraquults. They formed in coarse-textured sediments. They occur in nearly level areas, in drainageways, in depressions, and on seepage slopes.

In this county Plummer soils are associated with Chipley, Rutlege, Lakeland, Rains, Lynchburg, and Ocilla soils. They are the poorly drained members of the Lakeland-Chipley-Plummer-Rutlege drainage sequence. Plummer soils are coarser textured than Rains soils, but they are similar in drainage characteristics. They are coarser textured than Lynchburg and Ocilla soils and are better drained.

Profile of Plummer loamy sand, 1½ miles north of Maxton, 50 feet north of airbase boundary road:

Ap—0 to 7 inches, dark-gray (10YR 4/1) loamy sand; weak, fine, granular structure; very friable or loose; many fine roots; very strongly acid; abrupt, wavy boundary. 4 to 8 inches thick.

A21g—7 to 38 inches, gray (10YR 5/1) loamy sand to sand; weak, fine, granular structure; loose; few fine roots; very strongly acid; clear, wavy boundary. 24 to 36 inches thick.

A22g—38 to 42 inches, light-gray (10YR 7/1) loamy sand; very friable; weak, fine, granular structure; very strongly acid; clear wavy boundary. 0 to 6 inches thick.

Btg—42 to 48 inches +, light-gray (2.5Y 7/2) sandy loam; common, medium, distinct mottles of brownish yellow (10YR 6/6) and light yellowish brown (10YR 6/4); weak, medium, subangular blocky structure; friable; very strongly acid.

Range in characteristics.—The surface horizon ranges from gray to very dark gray in color. The A2 horizon ranges from light gray to dark gray in color and from sand to loamy sand in texture. The sandy A horizon ranges from 40 to 60 inches in thickness. It overlies a finer textured horizon. Mottles of brown to brownish yellow are common in the Btg horizon but are not present in all profiles.

PORTSMOUTH SERIES

Soils in the Portsmouth series are classified as Typic Umbraquults. They formed in medium-textured or moderately fine textured sediments in areas where the level of ground water was high.

In this county Portsmouth soils are associated with Coxville, Rains, Dunbar, Plummer, Rutlege, and McColl soils. They are the very poorly drained members of the Orangeburg-Norfolk-Goldsboro-Lynchburg-Rains-Portsmouth drainage sequence. Portsmouth soils are finer textured than Rutlege soils. Plummer, Coxville, Rains, and McColl soils lack the thick, dark-colored surface layer that is characteristic of Portsmouth soils.

Profile of Portsmouth loam, in the northeastern part of McArn Bay, 50 feet west of canal:

A1—0 to 10 inches, black (10YR 2/1) loam; moderate, medium or coarse, granular structure; very friable; many fine roots; very strongly acid; clear, wavy boundary. 8 to 20 inches thick.

B1g—10 to 12 inches, dark-gray (10YR 4/1) and gray (10YR 5/1) sandy loam; friable; weak, medium, subangular blocky structure; many fine roots; very strongly acid; clear, wavy boundary. 2 to 6 inches thick.

B2tg—12 to 28 inches, gray (10YR 6/1) sandy clay loam to light sandy clay; weak, medium, subangular blocky structure; friable or firm; slightly sticky; few fine

roots; tongues of material from the A1 horizon extend 12 inches or more into this layer; very strongly acid; gradual boundary. 12 to 30 inches thick.

B3g—28 to 50 inches, gray (10YR 6/1) sandy clay loam; few, fine distinct mottles of brownish yellow (10YR 6/6); weak, medium, subangular blocky structure; friable; pockets of sandy loam and loamy sand; few fine roots; very strongly acid. 10 to 24 inches thick.

Cg—50 to 60 inches, gray (10YR 6/1) sandy loam; few, medium, distinct mottles of strong brown and yellowish brown; massive; friable; pockets of loamy sand; very strongly acid.

Range in characteristics.—The surface horizon is black or very dark gray. The B horizon ranges from sandy loam to light sandy clay in texture and from light gray to dark gray in color. The solum is more than 40 inches thick. Mottles of yellowish brown or pale brown and strong brown occur in some profiles. The underlying strata range from loamy sand to sandy clay in texture.

RAINS SERIES

Soils in the Rains series are classified as Typic Ochraquults. They formed in moderately coarse textured to moderately fine textured sediments.

In this county Rains soils are associated with Lynchburg, Portsmouth, Goldsboro, Norfolk, Dunbar, Coxville, Chipley, McColl, and Plummer soils. They are the poorly drained members of the Orangeburg-Norfolk-Goldsboro-Lynchburg-Rains-Portsmouth drainage sequence. Rains soils are similar to Coxville and Plummer soils in drainage and are intermediate between those soils in texture and consistence. They are coarser textured than Coxville soils and are less firm in the B horizon than those soils. They are finer textured throughout the solum than Plummer soils. They are more poorly drained than Dunbar and Chipley soils. They are finer textured than Chipley soils but coarser textured than Dunbar soils. Rains soils lack the abundant strong-brown and yellowish-brown mottles in the middle and lower parts of the subsoil that characterize McColl soils.

Profile of Rains fine sandy loam, three-fourths of a mile east of St. Peters Church, 50 feet south of the county road leading to Wagram, in a wooded area:

O1—1 inch to 0, partly decomposed leaves and straw.

A1—0 to 6 inches, very dark gray (10YR 3/1) fine sandy loam; weak, medium, granular structure; very friable; many, coarse to fine, woody roots; very strongly acid; clear, wavy boundary. 3 to 10 inches thick.

A2—6 to 14 inches, gray (10YR 5/1) fine sandy loam; weak, medium, granular structure; very friable; common, coarse to fine, woody roots; small amount of material from A1 horizon in old root channels; very strongly acid; clear, wavy boundary. 3 to 12 inches thick.

B21tg—14 to 30 inches, gray (10YR 5/1) sandy clay loam; weak, medium, subangular blocky structure; friable; slightly sticky; few, fine to medium, woody roots; small amount of material from A1 and A2 horizons in old root channels; very strongly acid; gradual boundary. 14 to 30 inches thick.

B22tg—30 to 42 inches, gray (10YR 5/1 to 10YR 6/1) sandy clay loam; common, medium, distinct mottles of brownish yellow (10YR 6/6); weak, medium, subangular blocky structure; friable to firm; few fine roots; very strongly acid. 10 to 20 inches thick.

B3g—42 to 56 inches, gray (10YR 6/1) sandy clay loam; common, medium, distinct mottles of brownish yellow and strong brown; friable; weak, fine, subangular blocky structure; very strongly acid. 8 to 15 inches thick.

Cg—56 to 60 inches +, gray (10YR 6/1) sandy clay loam; common, coarse, distinct mottles of brownish yellow and pale brown; massive; friable; pockets of sandy loam and loamy sand; very strongly acid.

Range in characteristics.—The A horizon ranges from gray to very dark gray in color and from 10 to 20 inches in thickness. The B horizon ranges from sandy loam to heavy sandy clay loam in texture and from gray to light gray in color. The solum is more than 40 inches thick. Mottles in the B horizon range from few to common in number and from brownish yellow to strong brown in color. They are medium sized and distinct. The C horizon ranges from sandy clay loam to loamy sand in texture.

RUTLEGE SERIES

Soils in the Rutlege series are classified as Typical Humaquepts. They formed in coarse-textured sediments in areas where the level of ground water was high. They have a dark-colored surface layer, 8 to 20 inches thick, overlying sand and loamy sand.

In this county Rutlege soils are associated with Plummer, Chipley, Rains, and Portsmouth soils on Coastal Plain terraces and with Okenee soils on stream terraces. They are the very poorly drained members of the Lakeland-Chipley-Plummer-Rutlege drainage sequence. Rutlege soils are more poorly drained than Plummer and Rains soils. They are coarser textured than Rains soils and have thicker sandy layers than those soils. They are similar to Portsmouth and Okenee soils in color and drainage, but they are coarse textured to a greater depth than those soils.

Profile of Rutlege loamy sand, 1 mile south of Wagram, in Goose Pond, 250 feet inside northeast rim of bay:

O1—1 inch to 0, partly decomposed leaves, straw, and moss.

A1—0 to 9 inches, black (10YR 2/1) loamy sand; medium to high in organic-matter content; weak, medium, granular structure; very friable; abundant, medium to coarse, woody roots; very strongly acid; clear, wavy boundary. 8 to 20 inches thick.

C1g—9 to 11 inches, dark-gray (10YR 4/1) or gray (10YR 5/1) loamy sand; weak, medium, granular structure; very friable; many, fine to coarse, woody roots; very strongly acid; clear, wavy boundary. 2 to 5 inches thick.

C2g—11 to 30 inches, light-gray (10YR 7/1) loamy sand; few, fine, faint mottles of light yellowish brown (10YR 6/4); weak, medium, granular structure; very friable; few, fine to medium, woody roots; very strongly acid; gradual boundary. 15 to 30 inches thick.

C3g—30 to 46 inches +, white (10YR 8/1) sand; single grain; loose; very strongly acid.

Range in characteristics.—The A horizon is very dark gray in places. The underlying sandy horizons are white to dark-gray sand and loamy sand. The depth to finer textured sediments is 40 inches or more.

ST. LUCIE SERIES

Soils in the St. Lucie series are classified as Typic Quartzipsamments. They formed in thick beds of sand. They occur on gentle slopes. In most places there is a thin layer of coarse white sand at the surface.

In this county St. Lucie soils are associated with Lakeland, Chipley, and Plummer soils. They are considerably drier than Chipley and Plummer soils and are much lighter in color and coarser in texture than those soils. They are coarser textured throughout the profile than Lakeland soils and are much lighter in color.

Profile of St. Lucie sand, 1¼ miles southeast of Wagram, 300 yards south of field and 200 feet east of Goose Pond:

A1—0 to 3 inches, gray (N 5/0) sand; very thin layer of coarse white sand at surface; single grain; loose; few, fine and medium, woody roots; very strongly acid; clear, wavy boundary. 2 to 5 inches thick.

C1—3 to 11 inches, light-gray (10YR 7/1) coarse sand; single grain; loose; few woody roots; very strongly acid; gradual boundary. 6 to 12 inches thick.

C2—11 to 50 inches +, white (N 8/0) coarse sand; single grain; loose; very strongly acid.

Range in characteristics.—The surface layer is light gray in places, and the underlying sand is light gray to white.

VAUCLUSE SERIES

Soils in the Vaucluse series are classified as Typic Fragiudults. They formed in fine-textured to moderately coarse textured sediments. They occur in the Sandhills. Discontinuous layers and fragments of ironstone are common in these soils.

In this county Vaucluse soils are associated with Gilead, Hoffman, Lakeland, and Orangeburg soils. They have a browner A horizon and a redder B horizon than Gilead and Hoffman soils and a somewhat thicker, coarser textured subsoil than Hoffman soils. Vaucluse soils are redder and finer textured throughout than Lakeland soils. They resemble Orangeburg soils in color, but their B horizon is firm and slightly cemented and is thinner than that of those soils.

Profile of Vaucluse loamy sand, 6 to 10 percent slopes, 1¼ miles southwest of Old Hundred, half a mile east of Joes Creek:

A1—0 to 3 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, fine, granular structure; very friable to loose; many, medium to coarse, woody roots; few ironstone fragments, 1 to 3 inches in size; strongly acid; abrupt, wavy boundary. 2 to 5 inches thick.

A2—3 to 12 inches, light yellowish-brown (2.5Y 6/4) loamy sand to sand; single grain; loose; few fine to medium roots; very strongly acid; clear, wavy boundary. 3 to 12 inches thick.

B2ty—12 to 17 inches, reddish-yellow (7.5YR 6/6) sandy clay loam; weak, medium, subangular blocky structure; firm and slightly cemented; few, medium, woody roots; very strongly acid; gradual boundary. 4 to 10 inches thick.

[1] B3y—17 to 26 inches, reddish-yellow (5YR 6/8) sandy loam; weak, medium, subangular blocky structure; firm and slightly cemented; few woody roots; very strongly acid; gradual boundary. 7 to 15 inches thick.

C—26 to 52 inches, red (2.5YR 5/8) and reddish-yellow (5YR 6/6) sandy loam; massive; firm and slightly cemented; very strongly acid.

Range in characteristics.—An Ap horizon is present in places. In such areas, the thickness of the combined Ap and A1 horizons ranges from 4 to 8 inches. The color of these horizons is grayish brown or dark grayish brown. The color of the A2 horizon ranges from very pale brown to yellowish brown. In places a thin, discontinuous layer of ironstone occurs at the base of the A2 horizon. The B horizon ranges from red to strong brown in color, with variations to weak red, reddish brown, or light red. It is 10 to 36 inches thick. In texture, it ranges from sandy clay loam to sandy loam. The substratum material varies in color and texture. It ranges from highly mottled, kaolinitic clay to cemented or compacted sand containing thin layers of ironstone. In some places there are small to large amounts of ironstone fragments throughout the profile. In some areas rounded quartz pebbles, up to 2 inches in diameter, occur on the surface and throughout the profile.

[1] The "y" denotes a brittle, compact, panlike horizon.

WAGRAM SERIES

Soils in the Wagram series are classified as Arenic Paleudults. They formed in coarse-textured to moderately fine textured sediments. They have a thick, coarse-textured A horizon and a moderately fine textured B horizon (fig. 14).

In this county Wagram soils are associated with Marlboro, Faceville, Norfolk, Goldsboro, Orangeburg, Lakeland, Kenansville, Eustis, and Blaney soils. They are also associated with Lynchburg, Dunbar, and Rains soils, but they are better drained and have a thicker A horizon than any of those soils. Wagram soils have a thicker A horizon than Marlboro, Faceville, Norfolk, Orangeburg, and Goldsboro soils and a coarser textured B horizon than Marlboro and Faceville soils. They have a B horizon within 20 to 40 inches of the surface, which Lakeland soils lack. Their B horizon is finer textured and yellower than that of Eustis soils; it is thicker and slightly finer textured than that of Kenansville soils. Wagram soils resemble Blaney soils, but they have a friable B horizon in contrast to the slightly cemented, firm B horizon of Blaney soils.

Profile of Wagram loamy sand, 0 to 2 percent slopes, 4.2 miles north of Laurinburg, along U.S. Highway 501, 75 feet west of the road:

Ap—0 to 8 inches, grayish-brown (10YR 5/2) loamy sand; single grain; very friable; abrupt, smooth boundary. 6 to 10 inches thick.

A2—8 to 24 inches, pale-brown (10YR 6/3) loamy sand; single grain; loose; few thin horizontal bands; gradual, wavy boundary. 14 to 20 inches thick.

B1—24 to 27 inches, yellowish-brown (10YR 5/6) sandy loam; weak, medium, subangular blocky structure; friable; some material from the A2 horizon has penetrated this horizon; strongly acid; clear, wavy boundary 2 to 6 inches thick.

B21t—27 to 38 inches, yellowish-brown (10YR 5/8) sandy clay loam; weak, medium, subangular blocky structure; friable; slightly sticky; very strongly acid; gradual, wavy boundary. 8 to 16 inches thick.

B22t—38 to 52 inches, yellowish-brown (10YR 5/8) sandy clay loam; common medium mottles of yellowish-red; weak, medium and coarse, subangular blocky structure; friable when moist, slightly sticky when wet; common grains of clear quartz, the size of coarse sand; very strongly acid; gradual, wavy boundary. 10 to 18 inches thick.

B3—52 to 75 inches, yellowish-brown (10YR 5/6) sandy clay loam; weak, medium and coarse, subangular blocky structure; friable; few, medium, yellowish-red mottles and few, medium, pale-brown mottles; very strongly acid or strongly acid; gradual, irregular boundary. 20 to 30 inches thick.

C—75 to 82 inches, mottled yellowish-brown and gray sandy loam; structureless; lenses and pockets of sandy clay loam; some gray coarse sand; very strongly acid.

Range in characteristics.—An A1 horizon is present in places. The A1 and Ap horizons range from gray to dark grayish brown in color, and the A2 horizon ranges from very pale brown to yellowish brown. The thickness of the combined layers of the A horizon ranges from 20 to 40 inches. Thick-surface phases are recognized in areas where the A horizon is more than 30 inches thick. The B horizon ranges from sandy loam to sandy clay loam in texture and from brownish yellow to yellowish red in color.

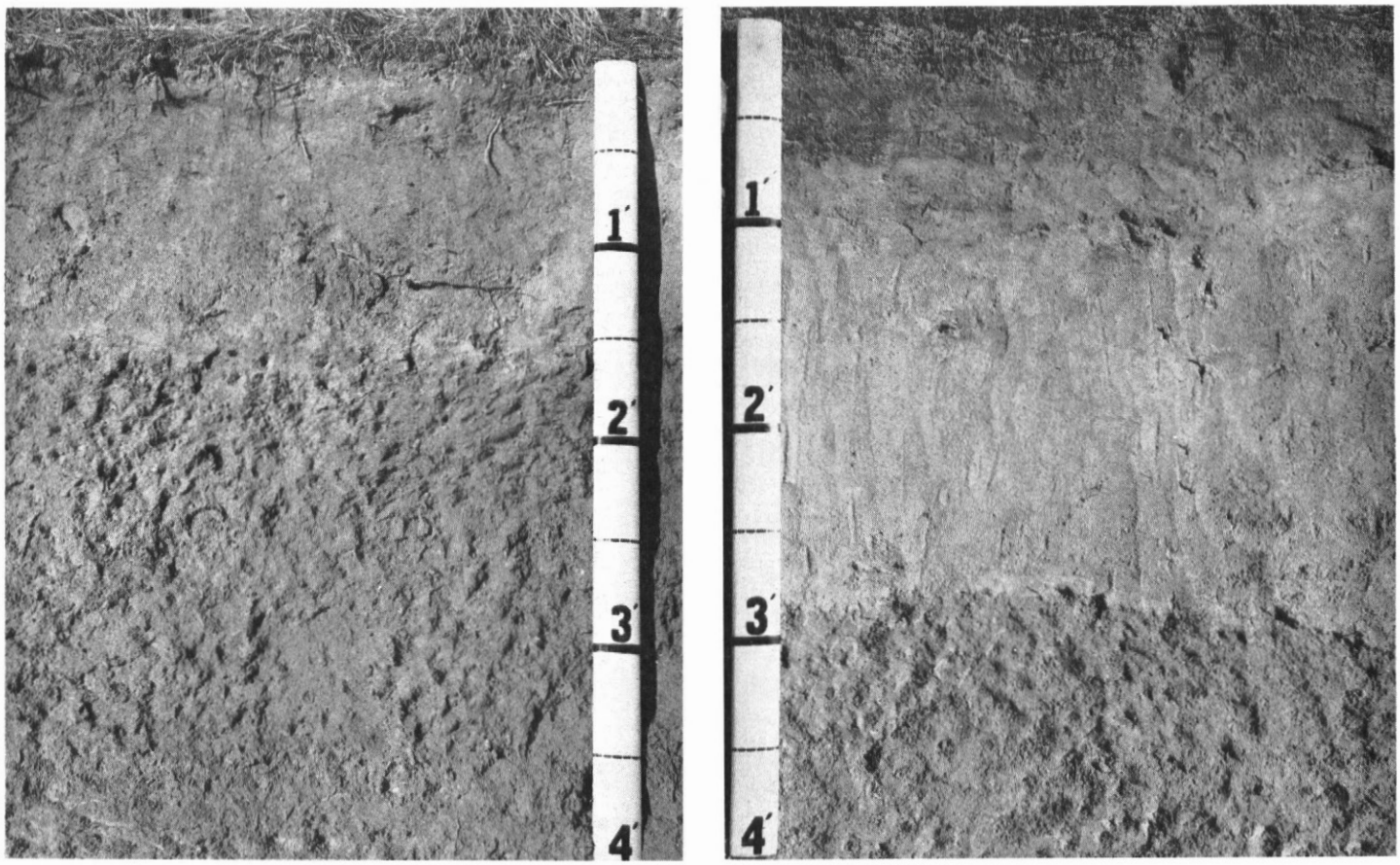

Figure 14.—**Profiles of Wagram loamy sand. The surface horizonis 20 to 30 inches thick in the profile shown at the left. It is 30 to 40 inches thick in the profile shown at the right.**

In places a discontinuous, brittle horizon occurs at the contact between the A and B horizons. In places an incipient plinthitic horizon occurs at a depth of 40 to 60 inches, and nodules of sesquioxides are present. The thickness of the solum is more than 40 inches.

General Nature of the County

This section gives general facts about Scotland County. It briefly discusses geology and physiography, water supply, agricultural history and trends, transportation and industry, and climate. The agricultural statistics used are from the North Carolina Annual Farm Census, 1964, N.C. Department of Agriculture.

Geology and Physiography [8]

Scotland County is on the Coastal Plain. The soils formed from unconsolidated sand, silt, and clay deposited mainly by water. Most of the sediments are in horizontal or gently sloping beds. The parent materials are from the Tuscaloosa formation, the Black Creek formation, and much younger surficial formations.

The Tuscaloosa formation underlies the Sandhills, which are in the western and northwestern parts of the county. The Lakeland, Gilead, and Vaucluse soils formed in material weathered from this formation and in surficial sediments that overlie it in places.

Sediments from the Black Creek formation consist of laminated clay, sandy clay, and sand. This formation underlies the lower lying, smoother soils in the southeastern parts of the county and is buried under several feet of surficial sediments in most places. The Norfolk, Marlboro, Rains, and Coxville soils formed in the surficial sediments overlying the Black Creek formation.

The northwestern part of Scotland County is in the rolling Sandhills, and the southeastern part is on the smooth part of the Coastal Plain. These two regions are separated by a distinct break in topography (fig. 15), the Orangeburg scarp.

The southeastern two-thirds of the county is nearly level to sloping. The broad plains are cut by permanent and intermittent streams. The interstream divides are pocketed with many shallow, oval-shaped depressions, called Carolina bays. These bays are oriented (fig. 16) in a northwest-southeast direction. They range in size from less than an acre to about 500 acres. Soils in the bays are mostly of the McColl, Coxville, and Portsmouth series. Sands of the Lakeland and St. Lucie series generally rim the south and east boundaries of the bays. In general, the larger the bay the more pronounced and more sandy the rims. These bays lack natural drainage outlets. A few are filled with water for long periods.

[8] R. J. McCracken, head, Soil Science Department, North Carolina State University, Raleigh, assisted in writing this section.

Water Supply

Scotland County has a well-distributed annual rainfall of 47.7 inches. The Lumber River forms its eastern boundary. Shoe Heel Creek, Leith Creek, and Gum Swamp Creek are the major streams. There are many other streams and ponds, and ground water is plentiful throughout the county. Water is at or near the surface in the area south and southeast of the Sandhills. It is easily tapped for household use, for watering livestock, and for irrigating fields. In many parts of the county, excavated ponds are used as sources of water for livestock and for irrigation.

History and Agricultural Trends

Scotland County was established in 1899. Laurinburg, the county seat, traces its history as far back as 1785, when the first families settled at the present townsite. The area was originally forested. Grasses growing in the pine forests provided good pasture for livestock, and the sale of cattle supplied the larger part of the cash income of the early settlers. The first clearings were small and scattered. Corn and wheat were grown for home use.

Cotton became a major crop near the end of the 18th century, and by 1850 it was the county's principal crop. Peaches, melons, and cantaloups were considered promising crops in the 1920's and 30's, but now there is only one commercial orchard in the county, and less than a thousand acres are planted to melons and cantaloups. Through the years, cotton has continued to be the principal crop. Improved varieties, mechanization, insect control, increased fertilization, and improved drainage have resulted in increased yields. The average production is now more than one bale per acre. In 1963, cotton was grown on 16,900 acres.

Much of the land in Scotland County is owned by absentee owners. In the wake of mechanization, many owners are hiring farm managers or are renting their land for large, mechanized operations. The number of sharecroppers is rapidly decreasing. Numerically, farms decreased from 1,241 in 1954 to 858 in 1963, but in the same period their average size increased from 100.5 to 115 acres. In 1963 cropland in the conservation reserve program amounted to 16,578 acres. A large part of this acreage is planted to trees.

Livestock and poultry products are increasing in importance. Beef cattle, hogs, laying hens, and turkeys are showing the greatest increase. Large acreages of the droughty, sandy soils once used for row crops have been converted to pasture and forage plants.

The following list shows estimated acreages of the major crops in 1963.

Crop	*Acres*
Cotton	16,900
Tobacco	996
Soybeans	10,000
Corn	9,093
Wheat	904
Oats	2,000
Barley	2,282
Hay and forage crops	6,000

Transportation and Industry

The county has railway service, airport facilities, and good highways. A number of industries are located at the site of a former military base.

Production of textiles, in eleven plants in the county, is by far the major industrial enterprise. The main tex-

Figure 15.—Landscape showing distinct break (the Orangeburg scarp) between the smooth part of the Coastal Plain and the Sandhills. Lakeland sand is on the higher area; Marlboro and Dunbar soils on the lower, smoother area.

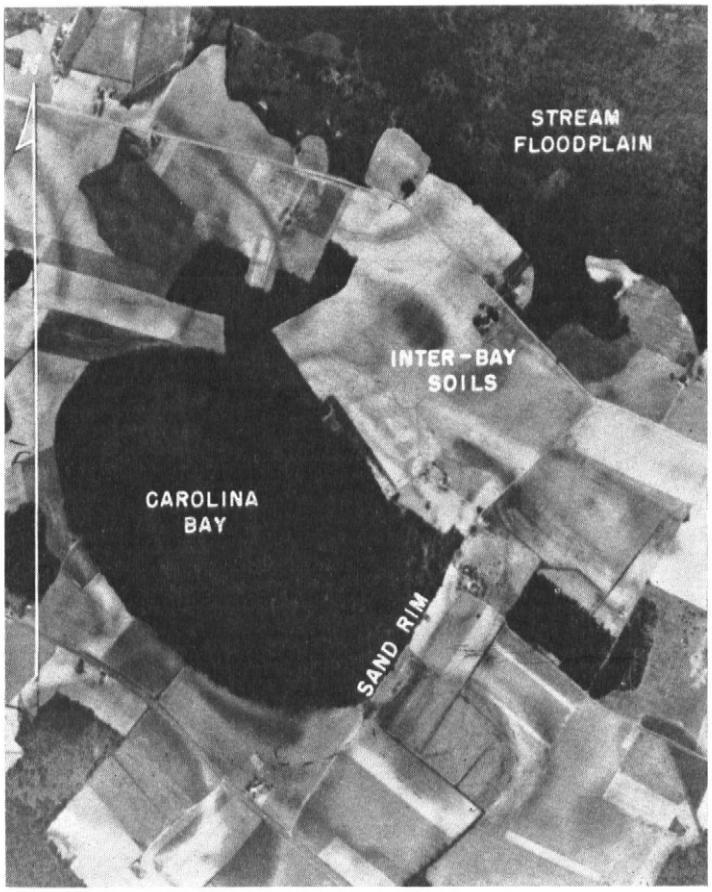

Figure 16.—Orientation of Carolina bays on the landscape of Scotland County.

tile products are cotton and synthetic yarns, towels, dish clothes, bedspreads, and tire cords. Other industrial products of the county are cornmeal, watches, mobile trailer homes, electric wire, furniture, fertilizer, and farm machinery. Seed-oil mills, seed processing plants, and two dehydrating plants are operated in the county, and there are a number of small, farm-related enterprises.

Forest industries produce lumber, plywood, and pulpwood. Two firms produce finished lumber; their combined cut is from 10 to 12 million board feet annually. One sawmill is at Wagram, and the other at Laurinburg. Pine lumber is the chief product, but lumber is also made from good-quality hardwoods and Atlantic white-cedar. A veneer and plywood plant is located at Laurinburg. It processes 2 to 4 million feet a year. The principal species milled are tupelo-gum, sweetgum, blackgum, and yellow-poplar. One firm purchases pulpwood at its buying yard in Maxton. Southern yellow pine is the principal kind bought; gum, yellow-poplar, maple, oak, and elm are bought as the need arises (*3*).

Climate [9]

Scotland County is in the North Carolina Sandhills. It adjoins South Carolina at the fall line, that is, at the zone of transition between the Piedmont and the Coastal Plain. Some areas have the rolling terrain characteristic of the Eastern Piedmont, but much of the county is relatively flat. Most of the area is 200 to 300 feet above sea level. Weather data for the county are taken at Laurinburg, which is slightly southeast of center, at an elevation of about 225 feet. Laurinburg is about 85 miles from the Atlantic Ocean to the southeast, and well over 100 miles from the Appalachian Mountains to the northwest. Both the mountains and the ocean have a moderating effect on the climate of the county. The Appalachians, which extend in a general northeast-southwest direction across the western part of the State, break the flow of cold air that moves in from the northwest, and the ocean tends to stabilize the temperature of the air that moves in from the east.

Precipitation.—Precipitation is usually plentiful and well distributed throughout the year in Scotland County. Normally, precipitation is most plentiful during the growing season and is ample for plant growth. The amount of rainfall varies considerably, however, and at least 1 year in 5 has 1 or more months during the growing season when rainfall is less than half of normal. In such years, as well as for shorter periods in other years, supplemental irrigation may be worth while if it can be provided economically.

The average amounts of rainfall listed in table 9 are from records at Laurinburg, and they are essentially accurate for all of Scotland County. The amount of rainfall during a particular rain varies considerably from place to place, but the average over extended periods is fairly uniform throughout the county. Variability is greatest in summer, when thunderstorms bring most of the rainfall. Characteristically, summer thunderstorms affect small areas, which may be widely scattered or close together. Usually, much rain falls in some parts of the county during such storms and little or none in other parts. As a result, the soils in some parts of the county may lack moisture while the soils in other parts are well supplied.

Winter precipitation is usually the result of movement of large low-pressure areas, and winter storms cover larger areas than do summer thundershowers. Winter rains usually are evenly distributed over the country. Snow does not fall every winter. The figures on snow cover in

[9] By A. V. HARDY, State climatologist, North Carolina.

TABLE 9.—*Temperature and precipitation data*

[All data from Laurinburg]

Month	Temperature				Precipitation				
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with—		Average total	One year in 10 will have—		Days with snow cover	Average depth of snow on days with snow cover
			Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than—	More than—		
	°F.	°F.	°F.	°F.	*Inches*	*Inches*	*Inches*	*Number*	*Inches*
January	58	34	76	18	3.2	1.7	6.0	1	1
February	61	37	77	21	3.6	1.2	6.8	(1)	1
March	65	41	81	27	4.3	1.2	6.9	(1)	2
April	76	50	88	36	3.7	1.1	7.0	0	
May	84	59	94	47	3.6	.8	6.2	0	
June	89	66	99	55	5.0	1.8	9.3	0	
July	92	69	100	63	5.3	2.1	10.0	0	
August	91	68	99	60	4.6	2.0	9.5	0	
September	85	62	94	50	4.6	.9	10.0	0	
October	76	51	88	37	3.4	.6	6.7	0	
November	68	41	81	27	3.4	.7	6.3	0	
December	58	34	75	17	3.0	1.2	6.0	(1)	2
Year	75	51	[2] 101	[3] 14	47.7	33.5	60.0	2	1

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

table 9 are averages for a period of several years. Very rarely—about once in 10 years—light snow falls in November and April, but it melts rapidly.

Thunderstorms account not only for most of the rainfall in Scotland County in summer, but also for most of the damage caused by weather. Violent thunderstorms bring heavy rains in the growing season, and sometimes strong wind. The damage caused by wind is usually confined to small areas, but in an average summer there are several local storms accompanied by winds strong enough to break tree limbs. In general, however, damage by wind throughout the county is slight.

Occasionally, hail accompanies thunderstorms during the growing season. About every second summer some areas are damaged by hail, but the percentage of cultivated land affected is small. Hail is most likely in May, June, and July, but occasionally it falls in August.

Damage resulting from excessively heavy rain is even more rare than wind and hail damage. Occasionally, 3 to 5 inches of rain falls in a single hour in an area of a few square miles. This is enough to cause flash flooding of streams and drainage facilities. At any given point in the county, however, such a rain can be expected only once or twice in 50 years.

Scotland County is not in the normal path of tropical hurricanes, but once in 10 to 20 years such a storm takes an inland course, and winds reaching the county have enough force to blow down trees and loosen shingles. Winter cold fronts usually move in from the northwest, and the intensity of both wind and cold is diminished as the fronts cross the Appalachians. Ice storms and tornadoes are rare in this county.

Prevailing winds.—Except late in summer and early in autumn, the prevailing winds are from the southwest. Winds are variable, however, and often shift to the northeast.

Sunshine and humidity.—More than 60 percent of the daylight hours are sunny. The proportion ranges from about half in winter to more than two-thirds late in spring and early in summer. The average relative humidity is less than 70 percent the year around. The humidity ranges from about 85 percent near sunrise to about 45 percent at midafternoon. It is highest late in summer and lowest in spring.

Probability of freezing temperature.—Figures 17 and 18 show the probabilities of the latest spring and earliest

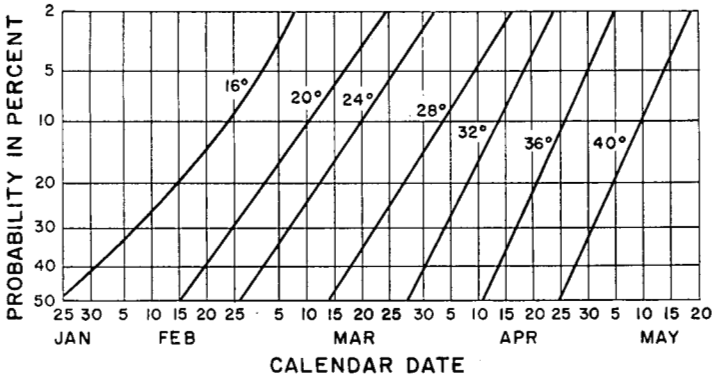

Figure 17.—**Probability that the temperature at Laurinburg will be 16° F., 20°, 24°, 28°, 32°, 36°, and 40° after the dates indicated in spring.**

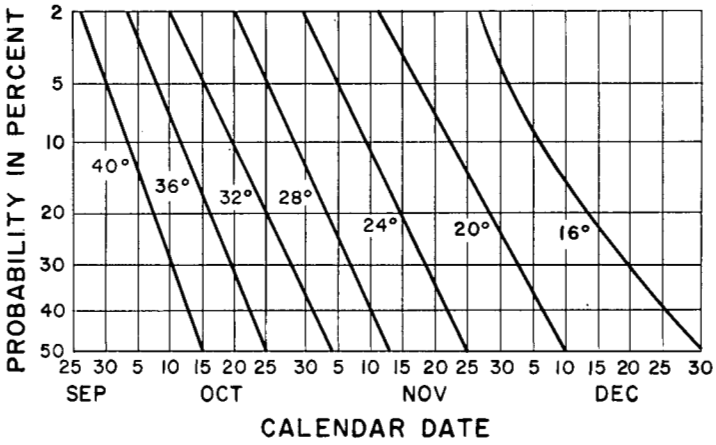

Figure 18.—**Probability that the temperature at Laurinburg will be 16° F., 20°, 24°, 28°, 32°, 36°, and 40° before dates indicated in fall.**

fall dates of specified temperatures. The probabilities are based on data recorded at Laurinburg over a period of 15 consecutive years. In general, the occurrence of frost or freezing temperature varies only slightly from place to place in the level areas, but variations may be significant in areas where there are hills and valleys.

To determine from figure 17 the probability that there will be a temperature at Laurinburg of 28° F. or lower after April 1, lay a ruler vertically on the line extending from the point indicated by April 1. Look to the left from the point where the ruler crosses the diagonal 28° line, and read the percentage listed at the side of the graph. The probability of a 28° temperature is approximately 14 percent, or about 1 year in 7. In the same manner, figure 18 can be used to determine the probability that the temperature listed will occur before the dates indicated in fall.

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Glossary

Acidity, soil. See Reaction, soil.

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity. The capacity of a soil to hold water in a form available to plants. Amount of moisture held in soil between field capacity, or about one-third atmosphere of tension, and the wilting coefficient, or about 15 atmospheres of tension.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

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; will 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 but can be pressed into a lump; will form a wire when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Brittle.—Breaking with a sharp, clean fracture when dry, or shattering into cleanly broken hard fragments if struck a sharp blow.

Cemented.—Hard and brittle; little affected by moistening.

Compact.—Dense and firm but without any cementation.

Creep, soil. The downward movement of masses of soil and soil material, primarily through the action of gravity. The movement is generally slow and irregular. It occurs most commonly when the lower part of the soil is nearly saturated with water, and it may be facilitated by alternate freezing and thawing.

Erosion. The wearing away of the land surface by wind, running water, and other geological agents.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Forest type. A collective term for a group of woodland stands that are similar in composition and development because of certain ecological factors.

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

Natural drainage. The conditions that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low water-holding capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and the C horizons.

Somewhat poorly drained soils are wet for significant periods but not all the time.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling in the deeper parts of the profile.

Permeability, soil. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are as follows: *Very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

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, or it is the hardened relict of the soft, red mottles. It is a form of laterite.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline.	9.1 and higher

Sand. As a soil separate, individual rock or mineral fragments ranging from 0.05 to 2.0 millimeters in diameter. Most sand grains consist of quartz, but sand may be of any mineral composition. As a textural class, soil that is 85 percent or more sand and not more than 10 percent clay.

Sesquioxides. Oxides having trivalent cations, as iron or aluminum oxides.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting upon parent material, as conditioned by relief over periods of time.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are (1) *single grain* (each grain by itself, as in dune sand) or (2) *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 profile below plow depth.

Substratum. Any layer lying beneath the solum, or true soil.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

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 porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

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