United States Department of Agriculture

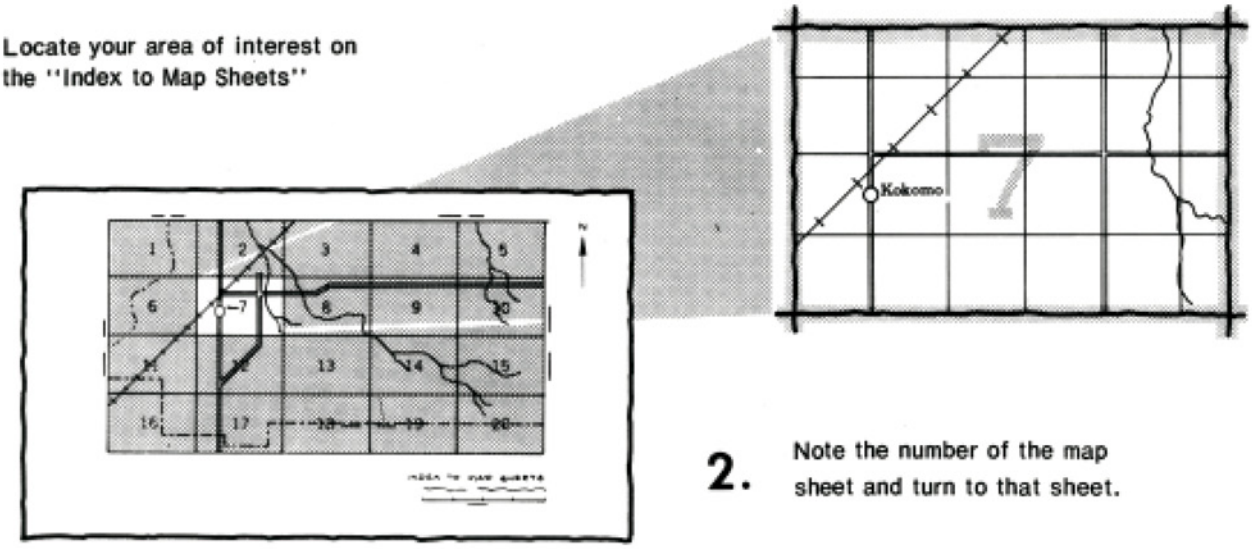
Soil Conservation Service

In cooperation with the North Carolina Department of Natural Resources and Community Development, the North Carolina Agricultural Research Service, the North Carolina Agricultural Extension Service, and the Sampson County Board of Commissioners

Soil Survey of Sampson County, North Carolina

HOW TO USE

1. Locate your area of interest on the "Index to Map Sheets"



2. Note the number of the map sheet and turn to that sheet.

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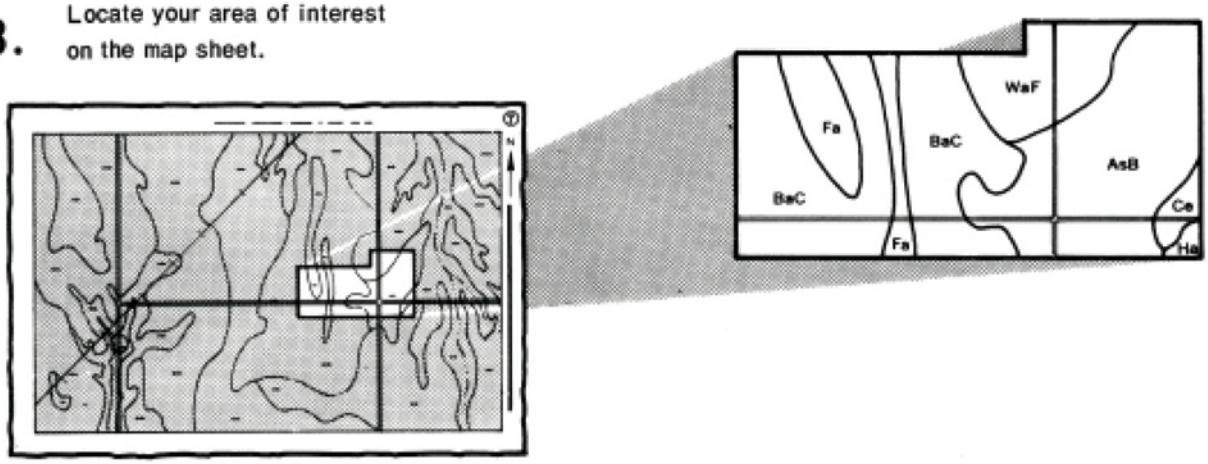
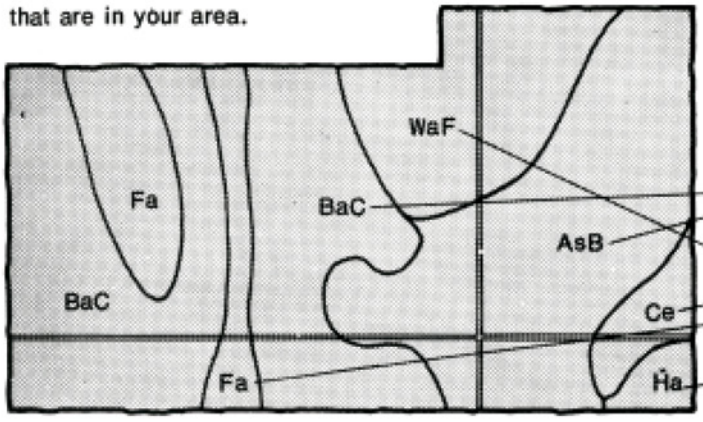


4. List the map unit symbols that are in your area.



Symbols

AsB
BaC
Ce
Fa
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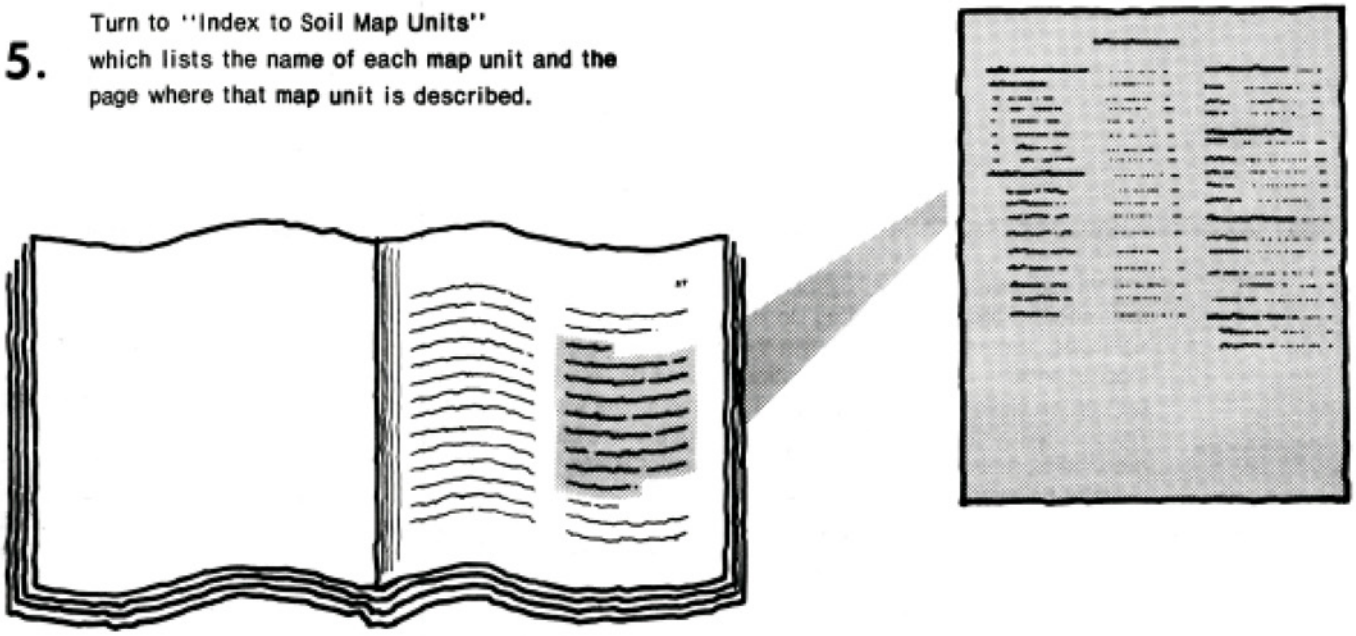
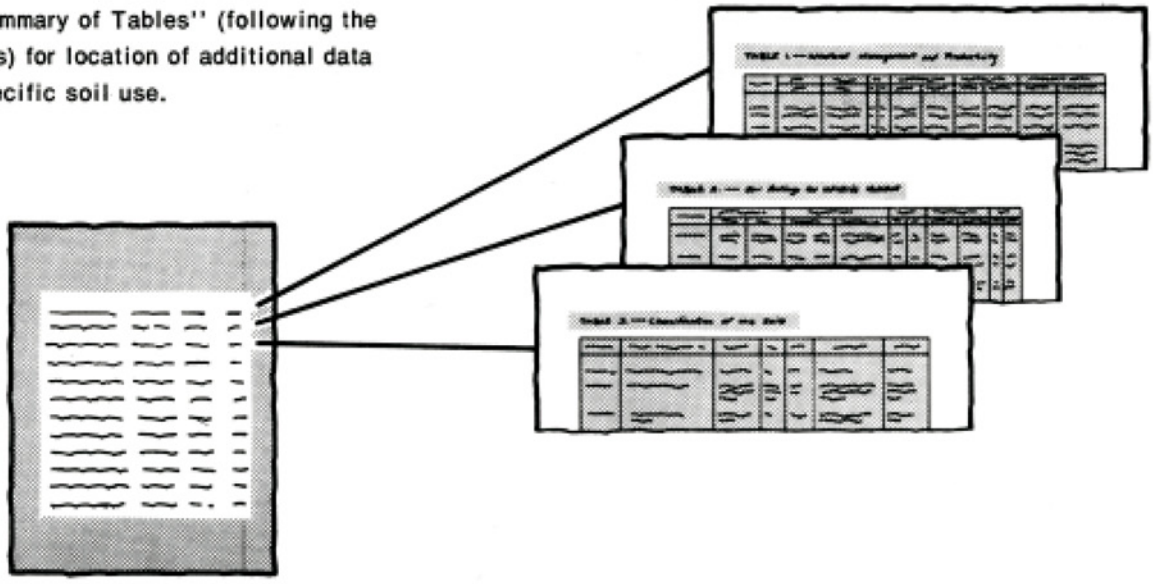
WaF

THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Research Service, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in 1981. Soil names and descriptions were approved in 1981. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1981. This survey was made cooperatively by the Soil Conservation Service and the North Carolina Department of Natural Resources and Community Development, the North Carolina Agricultural Research Service, the North Carolina Agricultural Extension Service, and the Sampson County Board of Commissioners. It is part of the technical assistance furnished to the Sampson County Soil and Water Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

This survey supersedes the soil survey of Sampson County published in 1926 (*4*).

Cover: A roadside stand of tomatoes, bell pepper, squash, potatoes, watermelon, cantaloup, and peaches. Sampson County is a major producer of vegetables and fruit in North Carolina.

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Foreword

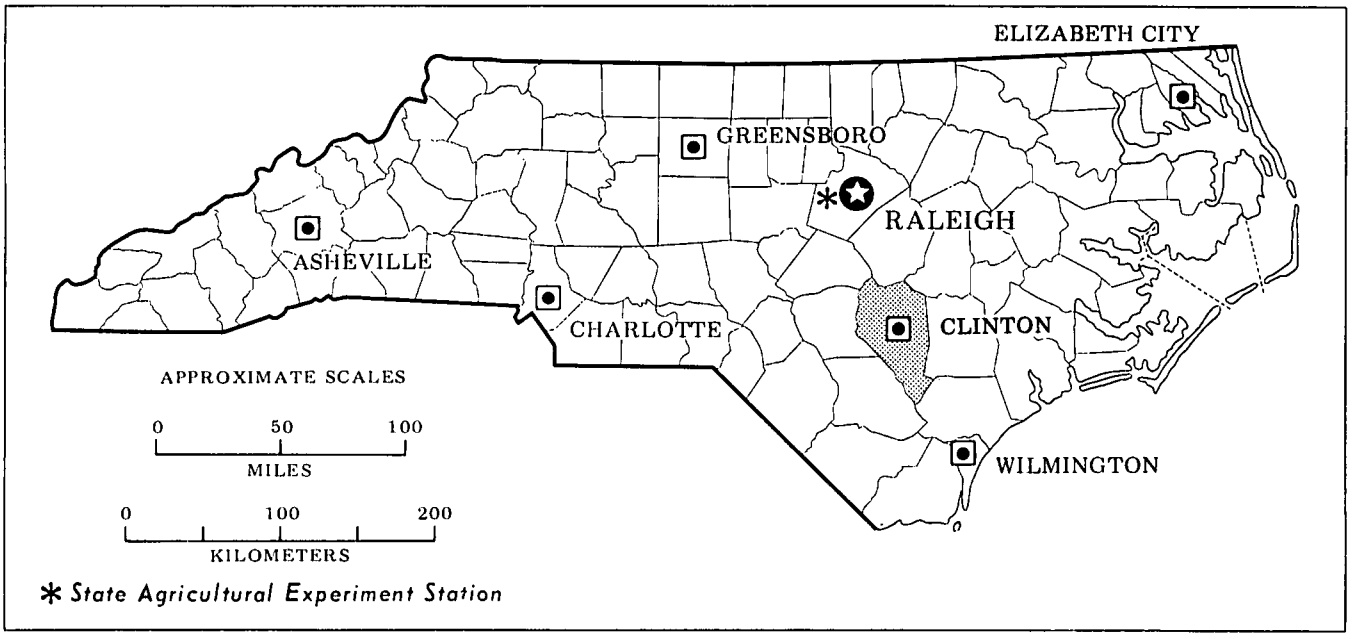
This soil survey contains information that can be used in land-planning programs in Sampson County, North Carolina. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the North Carolina Agricultural Extension Service.

Coy A. Garrett
State Conservationist
Soil Conservation Service



Location of Sampson County in North Carolina.

Soil Survey of Sampson County, North Carolina

By Clarence E. Brandon, Soil Conservation Service

Fieldwork by Clarence E. Brandon, William L. Barnhill, Mark Hudson, and Phil Tant, Soil Conservation Service; James R. Lemly and Jim Thayer, North Carolina Agricultural Extension Service; and Jim Norris and Richard H. Brooks, North Carolina Department of Natural Resources and Community Development

United States Department of Agriculture, Soil Conservation Service, in cooperation with the North Carolina Department of Natural Resources and Community Development, the North Carolina Agricultural Research Service, the North Carolina Agricultural Extension Service, and the Sampson County Board of Commissioners

Sampson County is in the southeastern part of North Carolina. It has a total area of 616,320 acres, or 963 square miles. Elevation ranges from about 20 feet in the southern part of the county to about 210 feet in the northern part.

Sampson County is bounded on the north by Harnett, Johnston, and Wayne Counties; on the northwest by Cumberland County; on the southwest by Bladen County; on the south by Pender County; and on the east by Duplin County. Mingo Swamp and the South River are along the entire western edge of the county. Little Coharie Creek, Great Coharie Creek, and Six Runs Creek are all major waterways, which form in the northern part of the county and come together in the southern part to form the Black River. The Black River joins the South River at the Bladen-Pender county line a few miles south of Sampson County.

In 1980, the total population of Sampson County was 49,687. The county seat is Clinton, near the center of the county. Its population was 9,000 in 1980 (*3*).

General Nature of the Survey Area

General information about the county is given in this section. Climate; physiography, relief, and drainage; natural resources; settlement; and farming are described.

Climate

Prepared by the National Climatic Center, Asheville, North Carolina.

Sampson County is hot and generally humid in summer because of moist maritime air. The winter is moderately cold but short because the mountains to the west protect the area against many cold waves. Precipitation is quite evenly distributed throughout the year and is adequate for all crops.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Clinton, North Carolina, in the period 1951 to 1976. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 43 degrees F, and the average daily minimum temperature is 32 degrees. The lowest temperature on record, which occurred at Clinton on December 19, 1964, is 3 degrees. In summer the average temperature is 77 degrees, and the average daily maximum temperature is 88 degrees. The highest recorded temperature, which occurred at Clinton on June 28, 1954, is 106 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50

degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 49 inches. Of this, 28 inches, or 58 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 24 inches. The heaviest 1-day rainfall during the period of record was 6.01 inches at Clinton on August 4, 1966. Thunderstorms occur on about 46 days each year, and most occur in summer.

The average seasonal snowfall is 2 inches. Seldom is there an accumulation of 1 inch or more. The greatest snow depth at any one time during the period of record was 4 inches.

The average relative humidity in midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 65 percent of the time possible in summer and 60 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 10 miles per hour, in spring.

Physiography, Relief, and Drainage

Sampson County is in the Coastal Plain physiographic province. The elevation ranges from 20 feet above sea level in the southwestern corner to 210 feet above sea level in the northern and northwestern parts of the county. The land surface is mostly nearly level to gently sloping but includes some side slopes along the dissected, shallow stream valleys. The area is made up of sedimentary soils transported from other areas by the ocean or rivers.

Most of Sampson County is in the Cape Fear River Basin. The drainage is southward into the Black River. The water in the Goshen Swamp watershed flows eastward into the Neuse River Basin. The flat or slightly depressional areas are generally swampy, and many creeks and rivers encircle the swamps. Large bays and pocosins are in the southern tip and in the northwestern part of the county.

Flooding in low-lying areas is common throughout the county. The principal flood plains border the South and Black Rivers and Little Coharie Creek, Great Coharie Creek, Six Runs Creek, Turkey Creek, and Stewart Creek. Specific flood hazard information on most streams is available from the U.S. Army Corps of Engineers.

Natural Resources

The principal natural resources in the county are a reasonable abundance of surface water, an excellent subsurface water supply, soils capable of producing a variety of crops, timber, an excellent climate, adequate rainfall, and favorable topography. Some clay deposits in the county are used for the manufacture of bricks.

Settlement

Sampson County was formed by an act of the Legislature of the State of North Carolina in 1784. The act divided Duplin County into two parts; the western part became Sampson County. Additional lands later were added to the county, and by 1872 the present boundaries were established, making Sampson County the largest county in North Carolina.

The early settlers in the county were farmers of Scotch-Irish, English, French, and Swiss descent; and from the time of the first settlement to the present, agriculture has been the mainstay of the economy in Sampson County. Most of the land that is easy to till has been cleared. The total acreage in cropland is increasing as more of the woodland is cleared, but cropland acreage around the towns is decreasing because of urban development. Soil wetness is the major limitation to most land uses in the county (fig. 1).

Farming

Sampson County farmers raise a variety of crops and livestock. The county is a primary producer of vegetables and swine in North Carolina, and it is a secondary producer of forestry products. It also ranks high in the production of turkeys, soybeans, eggs, and tobacco (*3*).

Farm woodlands are important in the county. Many farmers are carrying out improved woodland conservation practices and are deriving a supplemental income from their farm woodlands. About 59 percent of the county is in woodland.

The average farm size is continuing to increase. The trend is toward more mechanization and leasing of farmland. The use of irrigation (fig. 2) is increasing, especially for high-value cash crops.

About 203,000 acres, or 33 percent of the county, is cropland. It is estimated that 40,000 acres, or 20 percent of this land, has been adequately treated. The erosion hazard and inadequate drainage are conservation concerns on approximately 165,000 acres (*3*).

The future of farming looks bright for those farmers who protect and improve their natural resources and follow good proven production practices.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of sediment. They dug many holes to study the soil profile, which is the

Figure 1.—Soil wetness is a major limitation in the county. Here, a 5-inch drain tile is plowed under by a laser-controlled tile plow.

sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biologic activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, acidity, and other features that enable them to identify soils. After

Figure 2.—Irrigation is used primarily for the production of vegetable crops in the county. This sprinkler irrigation system is well suited to Orangeburg loamy sand, 0 to 2 percent slopes, and uses good-quality water from a deep well.

describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management were assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and

biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed, and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soils on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Soil Descriptions

1. Wagram-Autryville-Blanton

Nearly level and gently sloping, well drained and moderately well drained soils that have a sandy surface layer and a loamy subsoil; on uplands

This map unit is on broad, smooth uplands (fig. 3) in the western, central, and southern parts of the county.

This map unit makes up about 25 percent of the county. It is about 35 percent Wagram soils, 22 percent Autryville soils, 20 percent Blanton soils, and 23 percent Goldsboro, Leon, Lynchburg, Lynn Haven, Marvyn, Norfolk, Rains, Foreston, Torhunta, and Woodington soils.

The Wagram soils, which are nearly level and gently sloping, are well drained. Typically, the surface layer is grayish brown loamy sand. The subsurface layer is pale brown loamy sand. The upper part of the subsoil is yellowish brown sandy clay loam, and the lower part is brownish yellow sandy clay loam.

The Autryville soils, which are nearly level and gently sloping, are well drained. Typically, the surface layer is grayish brown loamy sand. The subsurface layer is pale brown loamy sand. The upper part of the subsoil is brownish yellow loamy sand, the middle part is yellowish brown sandy loam, and the lower part is brownish yellow loamy sand. The underlying material is very pale brown sand in the upper part and brownish yellow sandy clay loam in the lower part.

The nearly level and gently sloping Blanton soils are moderately well drained. Typically, the surface layer is grayish brown sand. The subsurface layer is very pale brown sand. The upper part of the subsoil is light yellowish brown sandy loam, the middle part is yellowish brown sandy clay loam, and the lower part is light yellowish brown sandy clay loam.

The major soils in this map unit are used mainly as cropland. In a few areas they are used as pasture and woodland. The Wagram and Autryville soils are suited to crops; the Blanton soils are poorly suited. The soils in this unit are well suited or suited to pasture. They are well suited or suited to most urban and recreation uses. Leaching of plant nutrients, soil blowing, and droughtiness are the main limitations to all uses.

2. Norfolk-Rains-Goldsboro

Nearly level and gently sloping, well drained, moderately well drained, and poorly drained soils that have a sandy or loamy surface layer and a loamy subsoil; on uplands

This map unit is on broad, smooth flats on the uplands. Areas of these soils are mainly in the northern part of the county, and a few areas are in the eastern and southern parts.

This map unit makes up 40 percent of the county. It is about 27 percent Norfolk soils, 25 percent Rains soils, 13 percent Goldsboro soils, and 35 percent Autryville, Aycock, Blanton, Faceville, Gritney, Lynchburg, Marvyn, Orangeburg, and Wagram soils.

The nearly level and gently sloping Norfolk soils are well drained soils, commonly on the higher lying and more sloping parts of the landscape. Typically, the surface layer is grayish brown loamy sand. The subsurface layer is very pale brown loamy sand. The upper part of the subsoil is yellowish brown sandy clay loam, and the lower part is mottled yellowish brown, gray, dark gray, and red sandy clay loam. The underlying material is strong brown sandy loam.

The nearly level Rains soils are poorly drained. Typically, the surface layer is very dark gray sandy loam. The subsurface layer is grayish brown sandy loam. The subsoil is gray sandy loam in the upper part and gray sandy clay loam in the lower part. The underlying material is gray sandy loam.

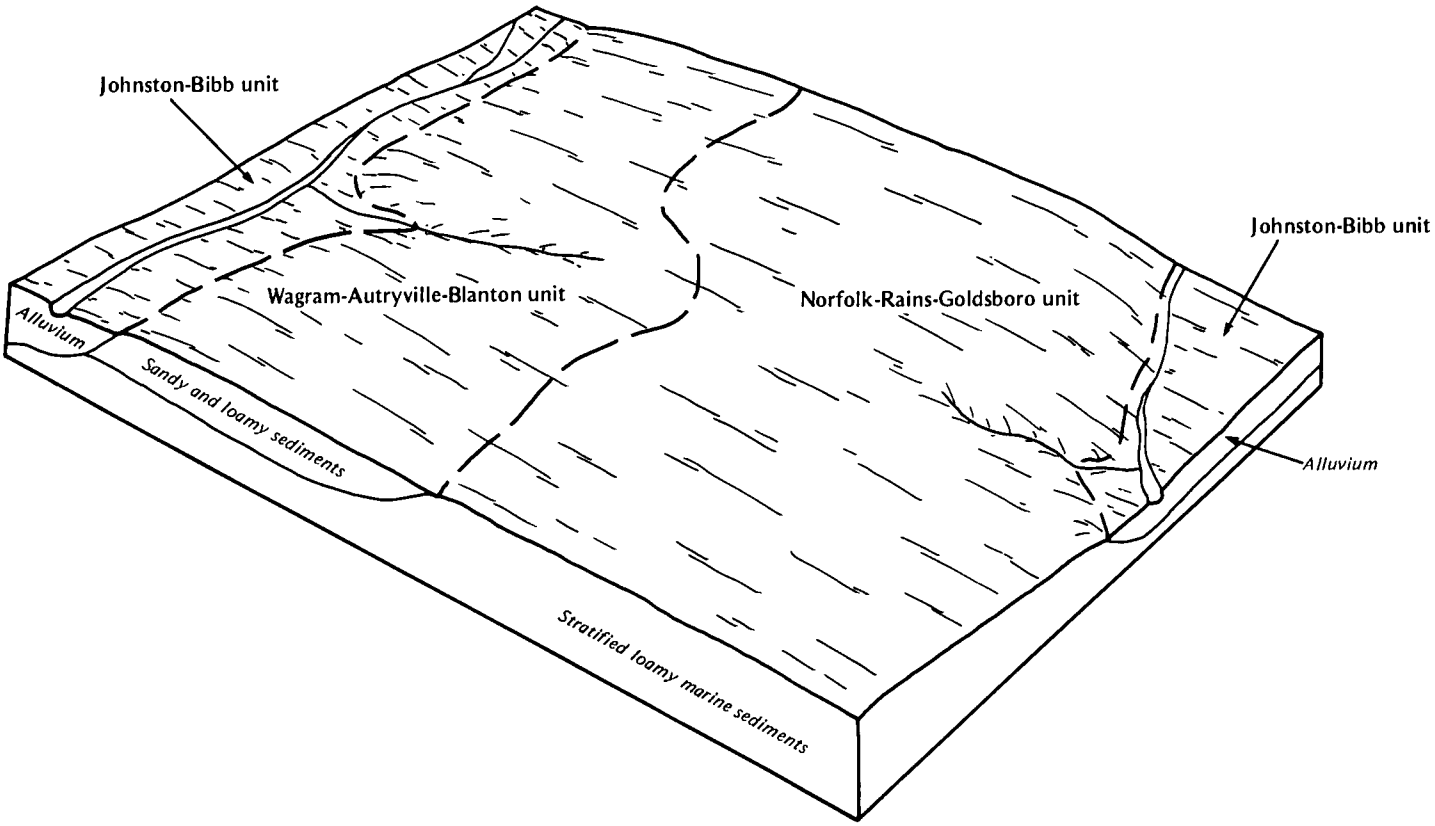


Figure 3.—Pattern of soils in map units 1, 2, and 5 north of Clinton.

The nearly level Goldsboro soils are moderately well drained. They are commonly on the smooth parts of the landscape. Typically, the surface layer is dark grayish brown loamy sand. The subsurface layer is pale brown loamy sand. The upper part of the subsoil is yellowish brown sandy clay loam; the middle part is pale brown sandy clay loam; and the lower part is mottled yellowish brown, light gray, brownish yellow, and light yellowish brown sandy clay loam. The underlying material is mottled light gray, light yellowish brown, and red sandy loam.

The soils of this map unit are used mainly as cropland. In some areas they are used as pasture and woodland. These soils are well suited to use as cropland and pasture. They are well suited or poorly suited to most urban and recreation uses. A seasonal high water table is the main limitation to most uses.

3. Aycock-Exum-Grantham

Nearly level and gently sloping, well drained, moderately well drained, and poorly drained soils that have a loamy surface layer and a loamy subsoil; on uplands

This map unit is on broad, smooth uplands in the northwestern part of the county.

This map unit makes up about 4 percent of the county. It is about 31 percent Aycock soils, 20 percent Exum soils, 10 percent Grantham soils, and 39 percent Nahunta, Norfolk, Goldsboro, Lynchburg, Rains, Faceville, Marvyn, and Gritney soils.

The nearly level and gently sloping Aycock soils are well drained soils, commonly on slightly rounded parts of the landscape. Typically, the surface layer is grayish brown silt loam. The subsurface layer is pale brown very fine sandy loam. The subsoil is light yellowish brown loam in the upper part, yellowish brown clay loam in the middle part, and brownish yellow clay loam in the lower part. The underlying material is mottled light gray, strong brown, and red clay loam.

The nearly level Exum soils are moderately well drained. They are commonly on the smooth parts of the landscape. Typically, the surface layer is grayish brown silt loam. The subsurface layer is pale brown very fine sandy loam. The upper part of the subsoil is brownish yellow loam; the middle part is yellowish brown and brownish yellow clay loam; and the lower part is mottled

light gray, brownish yellow, and red clay loam. The underlying material is gray clay loam.

The nearly level Grantham soils are poorly drained. They are commonly on the slightly lower lying or depressional parts of the landscape. Typically, the surface layer is black loam. The subsurface layer is grayish brown and light brownish gray loam. The upper part of the subsoil is gray clay loam, and the lower part is light gray clay loam.

The major soils of this map unit are used mainly as cropland. In a few areas they are used as pasture and woodland. These soils are well suited or suited to use as cropland and pasture. They are well suited, suited, or poorly suited to most urban and recreation uses. Wetness, low strength, and moderately slow permeability are the main limitations to most uses.

4. Lynn Haven-Leon-Cainhoy

Nearly level and gently sloping, poorly drained and somewhat excessively drained soils that have a sandy surface layer and a sandy subsoil; on uplands

This map unit is on broad, flat areas and low sand ridges on uplands. Areas of these soils are in the southern and southwestern parts of the county.

This map unit makes up about 12 percent of the county. It is about 27 percent Lynn Haven soils, 18 percent Leon soils, 17 percent Cainhoy soils, and 38 percent Tomahawk, Pamlico, Bibb and Johnston, Autryville, Blanton, Wagram, Marvyn, Woodington, Foreston, Pantego, and Torhunta soils.

The nearly level Lynn Haven soils are poorly drained. They are on broad, flat parts of the landscape. Typically, the surface layer is black sand. The subsurface layer is gray sand. The upper part of the subsoil is black sand, the middle part is light gray sand, and the lower part is black sand.

The nearly level Leon soils are poorly drained. They are on broad, flat parts of the landscape. Typically, the surface layer is dark gray sand. The subsurface layer is light gray sand. The upper part of the subsoil is dark reddish brown, weakly cemented sand, and the lower part is black, weakly cemented sand. The underlying material is light brownish gray sand.

The nearly level and gently sloping Cainhoy soils are somewhat excessively drained. They are on low sand ridges. Typically, the surface layer is gray sand. The subsoil is yellow and strong brown sand. The underlying material is light gray and dark reddish brown sand.

The soils in this map unit are used mainly as woodland. In a few areas they are used as cropland and pasture. They are poorly suited to use as cropland or pasture. They are poorly suited to most urban and recreation uses. Wetness, leaching of plant nutrients, soil blowing, and droughtiness are the main limitations to most uses.

5. Johnston-Bibb

Nearly level, poorly drained and very poorly drained soils that have a loamy or sandy surface layer and a loamy or sandy subsoil; on flood plains

This map unit is on nearly level flood plains and terraces of the streams and rivers throughout the county.

This map unit makes up about 19 percent of the county. It is about 32 percent Johnston soils, 17 percent Bibb soils, and 51 percent Chipley, Johns, Kalmia, Lumbee, Paxville, Roanoke, and Pamlico soils.

The Johnston soils are very poorly drained. Typically, the surface layer is black loam. The underlying material is dark grayish brown sandy loam in the upper part, light brownish gray loamy sand in the middle part, and dark grayish brown loamy sand in the lower part.

The Bibb soils are poorly drained. Typically, the surface layer is dark grayish brown loamy sand. The underlying material is grayish brown sandy loam in the upper part, gray sandy loam in the middle part, and light brownish gray loamy sand in the lower part.

The soils in this map unit are used mainly as woodland. In a few areas they are used as pasture. These soils are poorly suited to most locally grown crops and pasture. They are poorly suited to most urban and recreation uses. Wetness and the hazard of flooding are the main limitations to most uses.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Faceville fine sandy loam, 0 to 2 percent slopes, is one phase in the Faceville series.

Some map units in this survey area are made up of two major soils. These map units are called soil complexes or undifferentiated groups.

A *soil complex* consists of two or more major soils or one or more soils and a miscellaneous area (an area that has little or no soil material and supports little or no vegetation). The soils making up a complex, and the miscellaneous area if included, occur in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils and miscellaneous area are somewhat similar in all areas. Lynchburg-Urban land complex is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in a mapped area are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. Bibb and Johnston soils, frequently flooded, is an undifferentiated group in this survey area.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Soil Descriptions

Au—Autryville loamy sand, 0 to 6 percent slopes. This is a well drained soil on broad, smooth uplands. Most of the acreage of this soil is used as cropland. The rest is in forest and pasture. Mapped areas are irregular in shape and range from 25 to 400 acres.

Typically, the surface layer is grayish brown loamy sand 9 inches thick. The subsurface layer is pale brown loamy sand 14 inches thick. The subsoil, which extends to a depth of 41 inches, is brownish yellow loamy sand in the upper part and yellowish brown sandy loam in the lower part. The underlying material to a depth of 85 inches is brownish yellow loamy sand in the upper part, very pale brown sand in the middle part, and brownish yellow sandy clay loam in the lower part.

Permeability in the Autryville soil is moderately rapid in the upper part of the subsoil and moderate in the lower part. This soil has low available water capacity. It is very strongly acid or strongly acid throughout, except where the surface layer has been limed. The seasonal high water table remains below a depth of about 4 feet.

Included in mapping are a few small areas of Blanton, Cainhoy, Foreston, Norfolk, and Wagram soils. Blanton and Wagram soils are intermingled throughout the mapped areas. Foreston soils are in slight depressions.

Small areas of Norfolk soils are commonly in the mapped areas of this Autryville soil that are adjacent to areas dominated by Norfolk soils. Cainhoy soils are on small knolls. Typically, only two or three of these included soils are in any one mapped area, and they make up 5 to 20 percent of the total acreage.

This Autryville soil is suited to most crops and is used chiefly for tobacco, corn, peanuts, soybeans, small grains, sweetpotato, and watermelons. This soil is droughty and is subject to soil blowing. The blowing sand could damage young crops. Growing winter cover crops, minimum tillage, and use of windbreaks, crop residue, and crop rotations that include close-growing crops help to conserve moisture and reduce erosion by wind and water. This soil is well suited to pasture forage crops, such as Coastal bermudagrass and bahiagrass.

The dominant trees are loblolly and longleaf pines. The understory includes threeawn, panicum, turkey oak, common persimmon, and sassafras. Droughtiness is the main limitation to woodland use.

This soil is suited to most urban uses. Lawns and shrubs may be difficult to establish and maintain because of leaching of plant nutrients and droughtiness. Caving of trench walls and seepage are other urban problems. This soil is suited to recreation uses. The sandy surface layer is the main limitation to those uses.

This soil is in capability subclass IIs and woodland group 3s.

AyB—Aycock silt loam, 1 to 4 percent slopes. This is a well drained soil on smooth uplands near small intermittent streams. Most of the acreage of this soil is used as cropland, and some areas are in pasture and forest. The mapped areas are irregular in shape and range from 10 to 200 acres.

Typically, the surface layer is grayish brown silt loam 8 inches thick. The subsurface layer consists of pale brown very fine sandy loam 3 inches thick. The subsoil is 64 inches thick. The upper part is light yellowish brown loam. The middle part is yellowish brown clay loam. The lower part is brownish yellow clay loam mottled with light gray and strong brown below a depth of 52 inches. The underlying material to a depth of 85 inches is mottled light gray, strong brown, and red clay loam.

This Aycock soil has moderate permeability and high available water capacity. The subsoil is very strongly acid or strongly acid unless the soil has been limed. Surface runoff is medium.

Included in mapping are a few small areas of Exum, Gritney, Faceville, Norfolk, and Wagram soils and areas of soils that are slightly more clayey than is typical for the Aycock soil. Exum soils are in small depressions. Faceville soils are on slightly elevated ridges. The other inclusions are mostly near the outer edge of the mapped areas. The areas of included soils are less than 4 acres, and they make up 10 to 25 percent of the map unit.

This Aycock soil is well suited to crops. The major crops are corn, cotton, peanuts, pasture, small grains, soybeans, and truck crops. Surface runoff and susceptibility to erosion are the main limitations. Growing winter cover crops, minimum tillage (fig. 4), and use of crop residue help control runoff and erosion. This soil is well suited to pasture forage crops.

The dominant trees are loblolly pine, slash pine, and southern red oak. The understory includes American holly, flowering dogwood, low blueberry, greenbrier, and common persimmon.

This soil is suited to most urban uses and well suited to most recreation uses. The moderate permeability and low strength of the soil are the main limitations to those uses.

This soil is in capability subclass IIe and woodland group 2o.

BH—Bibb and Johnston soils, frequently flooded. This map unit consists of nearly level, poorly drained and very poorly drained soils along the major streams. Land use is predominantly woodland. Areas are oblong and range up to several hundred acres. Accessibility is limited by the dense vegetation and wet soil. The characteristics and composition of the soils were determined at points of access from roads, trails, and ditches. These observations should provide the soil interpretations needed for the expected land use.

The poorly drained Bibb soils make up about 45 percent of this map unit. They commonly are near the stream channel. Typically, they have a dark grayish brown loamy sand surface layer 6 inches thick. The underlying material to a depth of 80 inches is grayish brown sandy loam in the upper part, gray sandy loam in the middle part, and light brownish gray loamy sand in the lower part.

The very poorly drained Johnston soils make up about 35 percent of this map unit. They commonly are in abandoned stream channels and seep areas near higher lying soils. Typically, they have a black muck surface layer 30 inches thick. The underlying material to a depth of 62 inches is dark grayish brown sandy loam in the upper part, light brownish gray loamy sand in the middle part, and dark grayish brown loamy sand in the lower part.

The seasonal high water table in these soils is at or near the surface for several months during the year. When the water table is low, permeability of the loamy subsoil is moderate to moderately rapid. These soils are very strongly acid or strongly acid. They are flooded for brief periods.

Included in mapping are small areas of soils that are similar but are nonacid and a few small areas of muck. Also included are a few small areas of Lumbee and Paxville soils on low terraces. The included soils make up about 20 percent of this map unit.

Figure 4.—This corn was planted on Aycock silt loam, 1 to 4 percent slopes, in a field of Crimson Clover sod. Use of crop residue and minimum tillage improves the physical condition of the soil and conserves moisture.

Bibb and Johnston soils are poorly suited to crops. Flooding and wetness are the main limitations. Lack of suitable outlets is a limitation to the installation of drainage systems. If drained and protected from flooding, these soils are suited to pasture forage crops, such as fescue and Ladino clover.

The dominant trees are sweetgum, cottonwood, American sycamore, loblolly pine, yellow-poplar, green ash, water tupelo, and water oak. The understory includes panicum, bluestem, and perennial grasses. Wetness and flooding are the main limitations to woodland use.

These soils are poorly suited to urban and recreation uses. Wetness and flooding are the main limitations.

The Bibb soils are in capability subclass Vw and woodland group 2w, and the Johnston soils are in capability subclass VIIw and woodland group 1w.

BoB—Blanton sand, 0 to 6 percent slopes. This moderately well drained soil is on broad, smooth sand ridges on uplands. About half the acreage of this soil is used as cropland, turkey range, and pasture. The rest is mainly in woodland. The mapped areas are about as broad as long, and they range from about 20 to more than 150 acres.

Typically, the surface layer is grayish brown sand 8 inches thick. The subsurface layer is very pale brown sand 40 inches thick. The subsoil, which extends to a depth of 85 inches, is light yellowish brown sandy loam

in the upper part, yellowish brown sandy clay loam in the middle part, and light yellowish brown sandy clay loam in the lower part.

Permeability is rapid in the thick sandy surface layer and moderate in the subsoil. The available water capacity is low. This soil is very strongly acid or strongly acid unless limed. Surface runoff is slow. The seasonal high water table is below a depth of 5 or 6 feet.

Included in mapping are small areas of Wagram, Autryville, and Cainhoy soils. Also included in some mapped areas are small, oblong depressions that are somewhat poorly drained and contain a thin, weakly cemented subsoil layer. The included soils are intermingled throughout the mapped areas. They make up 10 to 20 percent of this map unit.

This Blanton soil is poorly suited to most crops; however, in some places it is used for crops, mainly peanuts, sweetpotato, and watermelon. Leaching of plant nutrients, soil blowing, and low available water capacity are the main limitations. Minimum tillage, use of crop residue and of windbreaks, and including close-growing grasses and legumes in the cropping system are needed to control soil blowing, reduce leaching, and conserve moisture. This soil is suited to pasture forage crops, such as Coastal bermudagrass and bahiagrass.

The dominant trees are loblolly, slash, and longleaf pines. The understory includes pineland threeawn, bluestem, turkey oak, and annual forbs. The thick, sandy surface layer is the main limitation.

This soil is suited to most urban and recreation uses. Droughtiness due to the sandy nature of this soil is the main limitation. Management commonly includes small, frequent applications of fertilizer and additions of water to lawns and plants during periods of limited rainfall.

This soil is in capability subclass IIIs and woodland group 3s.

CaB—Cainhoy sand, 0 to 5 percent slopes. This is a somewhat excessively drained soil on uplands. Most of this soil is in woodland. The rest is in pasture or hay. The mapped areas are generally about as broad as long and range from 10 to 100 acres.

Typically, the surface layer is gray sand 3 inches thick. The subsoil, which extends to a depth of 99 inches, is sand. It is yellow and strong brown in the upper part, light gray in the middle part, and dark reddish brown in the lower part.

This Cainhoy soil has rapid permeability and low available water capacity. It ranges from very strongly acid to slightly acid throughout. Surface runoff is slow.

Included in mapping are small areas of Blanton and Autryville soils. Also included are sandy soils that have a thin, black layer high in organic matter content within 60 inches of the surface; areas of Leon soils in shallow, narrow depressions; areas of soils that are loamy below a depth of 80 inches; and small areas of soils that have a whitish surface layer. The included soils are intermingled throughout the mapped areas. Typically, only two or three of these included soils are in any one mapped area, and they make up about 15 to 20 percent.

This Cainhoy soil is poorly suited to most locally grown crops. It is suited to Coastal bermudagrass. Droughtiness, leaching of plant nutrients, and soil blowing are the main limitations. Minimum tillage and the use of cover crops are practices that control soil blowing and reduce leaching.

The major trees are loblolly, slash, and longleaf pines. The understory includes little bluestem, panicum, and threeawn. The loose, sandy surface is the main limitation.

This soil is suited to most urban uses. Lawns are difficult to establish and maintain because of droughtiness. Sidewalls of excavated areas are commonly unstable. A high seepage rate limits the use of this soil as a site for sanitary facilities. This soil is poorly suited to most recreation uses, mainly because of the loose sand on the surface.

This soil is in capability subclass IVs and woodland group 3s.

ChA—Chipley sand, 0 to 2 percent slopes. This nearly level, moderately well drained soil is on smooth, low ridges. Most of the acreage of this soil is in woodland. The rest is mainly in cultivated crops and pasture. The mapped areas are oblong and range from 5 to 100 acres.

Typically, the surface layer is dark grayish brown sand 6 inches thick. The subsoil is yellowish brown sand 20 inches thick. The underlying material to a depth of 80 inches is sand. It is pale brown in the upper part, light brownish gray in the middle part, and light gray in the lower part.

Permeability is rapid, and available water capacity is low. This soil is very strongly acid or strongly acid throughout. Surface runoff is slow. The seasonal high water table is 2 to 3 feet below the surface.

Included in mapping are small areas of the Lumbee, Leon, Lynn Haven, Johns, and Kalmia soils. Johns, Leon, and Lynn Haven soils are in small depressions, and the Lumbee and Kalmia soils are intermingled throughout. The included soils make up 10 to 25 percent of this unit.

This Chipley soil is poorly suited to corn, soybeans, tobacco, and small grains. Droughtiness and susceptibility to leaching are the main limitations. Conservation practices, such as no-tillage, growing winter cover crops, and use of field borders and crop rotations that include close-growing crops, help to reduce leaching. This soil is suited to pasture forage crops.

The dominant trees are loblolly and slash pines. The understory includes panicum, turkey oak, greenbrier, and annual forbs.

This soil is poorly suited to most urban uses. Wetness is the main limitation. The soil is suited to dwellings without basements and to roads, and it is poorly suited to dwellings with basements and to septic tank absorption fields. It is poorly suited to most recreation uses because of the sandy texture of the surface layer.

This soil is in capability subclass IIIs and woodland group 2s.

Co—Coxville loam. This nearly level, poorly drained soil is in smooth or slightly depressional areas. Most of the acreage of this soil is in woodland. The rest is mainly in pasture and cultivated crops. The mapped areas are generally oval, and a few are large and range up to 40 acres in size.

Typically, the surface layer is dark gray loam 10 inches thick. The subsoil is 54 inches thick. It is gray clay loam in the upper part and gray sandy clay in the lower part. The underlying material to a depth of 85 inches is gray sandy loam.

Permeability is slow. This soil is very strongly acid or strongly acid throughout unless the surface layer has been limed. Surface runoff is slow to ponded. The seasonal high water table is at or near the surface.

Included in mapping are a few small areas of Grantham, Rains, Lynchburg, and Nahunta soils, mostly near the outer edge of the mapped areas. The included soils make up 10 to 25 percent of this map unit.

If drained, this Coxville soil is suited to the production of corn, soybeans, and small grains. It is poorly suited to tobacco and cotton. Wetness is the main limitation. Drainage systems commonly include tile and open ditches. In some areas, suitable outlets for the drainage system may be difficult to obtain. Even if drained, this soil is slower to dry out and warm up in spring than the adjacent, better drained soils. Use of crop residue helps to maintain tilth. This soil is suited to pasture and forage crops, such as fescue and Ladino clover.

The dominant trees are loblolly pine, slash pine, sweetgum, and water oak. The understory includes inkberry, large holly, greenbrier, southern bayberry, sourwood, American holly, and switchcane. Wetness is the main limitation to woodland use.

This soil is poorly suited to most urban and recreation uses. It is limited mainly by wetness, slow permeability, and low strength.

This soil is in capability subclass IIIw and woodland group 2w.

ExA—Exum silt loam, 0 to 2 percent slopes. This nearly level, moderately well drained soil is on broad, smooth uplands. The mapped areas are near shallow drainageways. Most of the acreage of this soil is cultivated. The rest is mainly in woodland and pasture. Mapped areas are irregular in shape and range from 10 to 25 acres.

Typically, the surface layer is grayish brown silt loam 7 inches thick. The subsurface layer is pale brown very fine sandy loam 4 inches thick. The subsoil is 57 inches thick. It is brownish yellow loam in the upper part, yellowish brown and brownish yellow clay loam in the middle part, and mottled light gray, brownish yellow, and red clay loam in the lower part. The underlying material to a depth of 85 inches is gray clay loam.

Permeability is moderate, and available water capacity is high. This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Surface runoff is slow. The seasonal high water table is 2 to 3 feet below the surface.

Included in mapping are a few small areas of Aycock, Goldsboro, Nahunta, and Norfolk soils. Aycock soils are on the slightly higher parts of the landscape. Nahunta soils are in small depressions. Goldsboro and Norfolk soils are in the mapped areas of this Exum soil that adjoin areas dominated by those soils. Typically, only two or three of the included soils are in any one mapped area, and they make up about 20 percent.

This Exum soil is well suited to all crops and is used chiefly for corn, soybeans, tobacco, and small grains. Artificial drainage may be required for tobacco. Conservation practices, such as no-tillage and use of field borders and crop rotations that include close-growing crops, help to hold the soil in place. Artificial drainage may be needed to remove water from small wet areas. This soil is well suited to pasture forage crops.

The dominant trees are yellow-poplar, sweetgum, white oak, southern red oak, American sycamore, slash pine, and loblolly pine. The understory includes American holly, flowering dogwood, low blueberry, common persimmon, and greenbrier. Wetness is the main limitation to woodland use.

This soil is suited to most urban and recreation uses. Wetness and low strength are the main limitations.

This soil is in capability subclass IIw and woodland group 2w.

FaA—Faceville fine sandy loam, 0 to 2 percent slopes. This well drained soil is on slightly convex to rounded uplands. Most of the acreage of this soil is in cultivated crops. The mapped areas are irregular in shape and range from 10 to 30 acres.

Typically, the surface layer is brown fine sandy loam 8 inches thick. The subsurface layer is light yellowish brown fine sandy loam 6 inches thick. The subsoil to a depth of 99 inches is yellowish red clay in the upper part, yellowish red sandy clay in the middle part, and mottled strong brown, yellowish brown, and red sandy clay loam in the lower part.

Permeability is moderate, and available water capacity is moderate. This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Surface runoff is medium.

Included in mapping are a few small areas of Norfolk and Wagram soils. Also included are small areas of soils that have pronounced iron concretions in the lower part of the subsoil. The included soils are intermingled throughout the mapped areas. They commonly are less than 4 acres, and they make up about 10 to 25 percent of each map unit.

This Faceville soil is well suited to most locally grown crops. Snap beans, tomatoes, cucumbers, sweetpotato, corn, soybeans, and tobacco are the main crops. Row crops can be grown continuously. Use of crop residue, cover crops, and field borders should be considered in managing this soil. This soil is well suited to the production of pasture forage crops.

The dominant trees are loblolly pine, slash pine, yellow-poplar, cherrybark oak, American holly, flowering dogwood, black cherry, hickory, red oak, and white oak. The understory includes spreading panicum, little bluestem, American holly, flowering dogwood, and greenbrier.

This soil is well suited to most urban and recreation uses.

This soil is in capability class I and woodland group 3o.

FaB—Faceville fine sandy loam, 2 to 6 percent slopes. This well drained soil is on slightly convex to rounded uplands. Most of the acreage of this soil is cultivated. The rest is in woodland and pasture. The mapped areas are irregular in shape and range from 10 to about 30 acres.

Typically, the surface layer is brown fine sandy loam 8 inches thick. The subsurface layer is light yellowish brown fine sandy loam 6 inches thick. The subsoil to a depth of 99 inches is yellowish red clay in the upper part, yellowish red sandy clay in the middle part, and strong brown sandy clay loam in the lower part.

Permeability is moderate, and available water capacity is moderate. This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Surface runoff is medium. The hazard of erosion is moderate.

Included in mapping are a few small, eroded spots that have a sandy clay loam surface layer. Also included are small areas of Norfolk, Aycock, and Wagram soils and areas of soils that have pronounced iron concretions in the lower part of the subsoil. The included soils are intermingled throughout the mapped areas. They commonly are less than 4 acres, and they make up about 25 percent of each map unit.

This Faceville soil is well suited to the production of tobacco, corn, soybeans, vegetable crops, and small grains. The susceptibility of this soil to erosion is the main limitation. Conservation practices, such as use of field borders, crop residue, and crop rotations that include close-growing crops, help control erosion and conserve water. This soil is well suited to pasture forage crops.

The dominant trees are loblolly and slash pines. The understory includes spreading panicum, little bluestem, American holly, flowering dogwood, and greenbrier.

This soil is well suited to most urban and recreation uses. Low strength of the soil is a limitation to the design and construction of roads.

This soil is in capability subclass IIe and woodland group 3o.

Fo—Foreston loamy sand. This nearly level, moderately well drained soil is on broad, smooth uplands. About half the acreage of this soil is cultivated. The rest is mainly in woodland or pasture. The mapped areas are irregular in shape and range from about 10 to 50 acres.

Typically, the surface layer is very dark gray loamy sand 2 inches thick. The subsurface layer is grayish brown loamy sand 4 inches thick. The subsoil is 61 inches thick. It is light yellowish brown sandy loam in the upper part, gray loamy sand in the middle part, and light brownish gray loamy sand in the lower part. The underlying material to a depth of 85 inches is pinkish gray sand.

Permeability is moderately rapid, and available water capacity is low. This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Surface runoff is slow. The seasonal high water table is between depths of 2.5 and 3.5 feet.

Included in mapping are small areas of Rains, Woodington, Autryville, and Lynchburg soils. The included soils, which are intermingled throughout the mapped areas, make up about 10 percent of each.

This Foreston soil is well suited to the production of corn, soybeans, tobacco, cotton, and small grains. Wetness is the main limitation. Artificial drainage may be required for tobacco. Use of crop residue helps maintain tilth. This soil is well suited to pasture forage crops.

The dominant trees are loblolly, slash, and longleaf pines. The main understory includes little bluestem, panicum, pineland threeawn, toothachegrass, gallberry, and switchgrass.

This soil is suited to most urban uses. Wetness is the main limitation to those uses. Caving of trench walls is common. The soil is well suited to most recreation uses.

This soil is in capability subclass IIw and woodland group 2w.

GoA—Goldsboro loamy sand, 0 to 2 percent slopes. This nearly level, moderately well drained soil is on smooth flats and in shallow depressions on uplands. Most of the acreage of this soil is cultivated. The rest is in woodland and pasture. The mapped areas are nearly as broad as long and range from 10 to about 30 acres.

Typically, the surface layer is dark grayish brown loamy sand 8 inches thick. The subsurface layer is pale

brown loamy sand 2 inches thick. The subsoil is 86 inches thick. It is yellowish brown sandy clay loam in the upper part, pale brown sandy clay loam in the middle part, and mottled yellowish brown, light gray, brownish yellow, and light yellowish brown sandy clay loam in the lower part. The underlying material to a depth of 99 inches is mottled light gray, light yellowish brown, and red sandy loam.

Permeability is moderate, and available water capacity is moderate. This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Surface runoff is slow to medium. The seasonal high water table remains below a depth of about 2 to 3 feet.

Included in mapping are a few small areas of Lynchburg, Norfolk, and Foreston soils, areas of a more clayey soil near Kerr and Harrels, and areas of soils that have slopes greater than 2 percent. The included soils are intermingled throughout. They commonly are less than 4 acres and make up about 25 percent of this map unit.

This Goldsboro soil is well suited to corn, cotton, tobacco (fig. 5), soybeans, vegetable crops, and small grains. Wetness is the main limitation. Use of crop residue is a common practice. Artificial drainage generally is required to prevent tobacco from drowning during wet seasons. This soil is well suited to the production of pasture forage crops.

The dominant trees are sweetgum, southern red oak, white oak, yellow-poplar, American sycamore, slash pine, and loblolly pine. The understory includes American holly, low blueberry, flowering dogwood, greenbrier, and persimmon.

This soil is suited to most urban and recreation uses. Wetness is the main limitation.

This soil is in capability subclass IIw and woodland group 2w.

Gr—Grantham loam. This nearly level, poorly drained soil is in smooth, shallow depressions on uplands. Most of the acreage of this soil is in woodland. The rest is mainly cultivated or in pasture. The mapped areas are oblong and range from 5 to about 20 acres.

Typically, the surface layer is black loam 3 inches thick. The subsurface layer, 6 inches thick, is grayish brown loam in the upper part and light brownish gray loam in the lower part. The subsoil to a depth of 85 inches is gray clay loam in the upper part and light gray clay loam in the lower part.

Permeability is moderately slow. This soil ranges from extremely acid to strongly acid throughout, except where the surface layer has been limed. The seasonal high water table is at or near the surface.

Included in mapping are small intermingled areas of soils that have a more clayey subsoil than this Grantham soil. Also included are small areas of Rains, Nahunta, and Lynchburg soils. The Rains and Lynchburg soils are on the outer edge of the mapped areas. The Nahunta soils are intermingled throughout slightly elevated areas. Typically, only two or three of the included soils are in any one mapped area, and they make up about 15 percent.

If this Grantham soil is used for crops, wetness is the main limitation. If drained, this soil is suited to corn, soybeans, vegetable crops, and small grains. Tillage might be delayed because of wetness, particularly in spring. Lack of suitable outlets and moderately slow permeability of the soil are limitations to the installation of drainage systems. This soil is well suited to pasture forage crops, such as fescue and Ladino clover.

The dominant trees are sweetgum, American sycamore, and yellow-poplar. The understory includes sourwood, greenbrier, giant cane, sweetbay, sassafras, and American holly. Wetness is the main limitation to woodland use.

This soil is poorly suited to most urban and recreation uses. Wetness is the main limitation.

This soil is in capability subclass IIIw and woodland group 2w.

GtC—Gritney fine sandy loam, 4 to 8 percent slopes. This well drained or moderately well drained soil is on short side slopes. Most of the acreage of this soil is in woodland. The mapped areas are long and narrow and range from 5 to 20 acres.

Typically, the surface layer is dark grayish brown fine sandy loam 4 inches thick. The subsurface layer is pale brown fine sandy loam 8 inches thick. The subsoil is 46 inches thick. It is yellowish brown sandy clay loam in the upper part, yellowish brown clay in the middle part, and gray clay in the lower part. The underlying material to a depth of 85 inches is mottled gray, brownish yellow, and red clay loam.

In this Gritney soil, permeability is slow, available water capacity is moderate, and shrink-swell potential is high. This soil is very strongly acid or strongly acid throughout. Surface runoff is medium to rapid.

Included in mapping are a few small areas of Norfolk, Bibb, and Johnston soils. The Bibb and Johnston soils are along the narrow drainageways. Norfolk soils are intermingled throughout the mapped areas of this Gritney soil. The included soils make up about 25 percent of this map unit.

This Gritney soil is poorly suited to crops. The short side slopes limit farming.

The dominant trees are loblolly, slash, and longleaf pines. The understory includes little bluestem and panicum.

This soil is poorly suited to most urban and recreation uses. The clayey subsoil and high shrink-swell potential are the main limitations to those uses.

This soil is in capability subclass IVe and woodland group 3o.

Figure 5.—A young crop of tobacco is intermingled with field windstrips on Goldsboro loamy sand, 0 to 2 percent slopes.

Jo—Johns fine sandy loam. This nearly level, somewhat poorly drained to moderately well drained soil is on stream terraces. About half the acreage of this soil is in cultivated crops or in pasture. The rest is in woodland. The mapped areas are much longer than wide and range from 20 to 80 acres.

Typically, the surface layer is dark gray fine sandy loam 8 inches thick. The subsurface layer is pale brown sandy loam 4 inches thick. The subsoil is 24 inches thick. It is brown sandy loam in the upper part, yellowish brown sandy clay loam in the middle part, and grayish brown sandy loam in the lower part. The underlying material to a depth of 65 inches is light gray sand.

Permeability is moderate. This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Surface runoff is slow. The seasonal high water table is 1.5 to 3.0 feet below the surface. This soil is subject to rare flooding.

Included in mapping are a few small areas of Kalmia, Lumbee, and Chipley soils, mostly near the outer edge of the mapped areas. Typically, only one or two of these soils are in any one area, and they make up about 15 percent.

This Johns soil is poorly suited to crop production. The main limitations to the use of the soil for crops are wetness and flooding. If drained, this soil is well suited to the production of cotton, corn, soybeans, small grains, cucumbers, and bell peppers. The most common conservation practice is use of crop residue. Artificial drainage is generally required to prevent tobacco from drowning during wet seasons. This soil is well suited to

pasture forage crops, such as Ladino clover and tall fescue.

The dominant trees are loblolly pine, slash pine, and sweetgum. The understory includes American holly, flowering dogwood, low blueberry, greenbrier, and common persimmon.

This soil is poorly suited to most urban and recreation uses. It is limited mainly by wetness and flooding. Caving of cutbanks is also a concern.

This soil is in capability subclass IIw and woodland group 2w.

JT—Johnston loam. This nearly level, very poorly drained soil is on narrow to moderately broad flood plains. Although this unit was mapped with fewer detailed observations than were most other units in the survey area, these observations should provide the soil interpretations needed for the major expected land uses. Most of the acreage of this soil is in woodland. A small acreage is in pasture. The mapped areas are 10 to more than 1,000 acres.

Typically, the surface layer is black loam 30 inches thick. The underlying material to a depth of 62 inches is dark grayish brown sandy loam in the upper part, light brownish gray loamy sand in the middle part, and dark grayish brown loamy sand in the lower part.

Permeability is moderately rapid in the upper part of this soil and rapid in the lower part. This soil is very strongly acid or strongly acid. The seasonal high water table is at or near the surface. This soil is subject to frequent flooding for long periods.

Included in mapping are small narrow strips of Bibb soils that are commonly adjacent to the stream channel.

This Johnston soil is poorly suited to the production of row crops and pasture forage crops. Wetness and flooding are the main limitations.

The dominant trees are baldcypress, pond pine, red maple, ash, sweetgum, tupelo, elm, yellow-poplar, river birch, water oak, willow oak, and swamp white oak. The understory includes inkberry, American holly, greenbrier, switchcane, and blueberry. Wetness and flooding are the main limitations to woodland use.

This soil is poorly suited to most urban and recreation uses. Flooding and wetness are the main limitations.

This soil is in capability subclass VIIw and woodland group 1w.

KaA—Kalmia loamy sand, 0 to 3 percent slopes. This well drained soil is on terraces. Most of the acreage of this soil is cultivated. Only a small acreage is used for pasture and woodland. The mapped areas are oblong and range from 10 to 30 acres.

Typically, the surface layer is dark grayish brown loamy sand 9 inches thick. The subsoil is 27 inches thick. It is dark yellowish brown sandy loam in the upper part, yellowish brown sandy clay loam in the middle part, and yellowish brown sandy loam in the lower part. The underlying material to a depth of 65 inches is light yellowish brown sand.

In this Kalmia soil, permeability is moderate, and available water capacity is moderate. This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Surface runoff is medium. This soil is subject to rare flooding.

Included in mapping are a few small areas of Johns, Lumbee, and Chipley soils. Most of the included soils are on the outer edge of the mapped areas. The included soils are less than 4 acres and make up between 20 and 25 percent of this map unit.

This Kalmia soil is well suited to the production of corn, tobacco, soybeans, and small grains. Growing winter cover crops, minimum tillage, and use of crop residue help maintain tilth and conserve water.

The dominant trees are loblolly pine, slash pine, yellow-poplar, and cherrybark oak. The understory includes American holly, flowering dogwood, persimmon, blueberry, greenbrier, and sourwood.

This soil is well suited to most urban and recreation uses. Seepage is the main limitation.

This soil is in capability class I and woodland group 2o.

LeA—Leon sand, 0 to 2 percent slopes. This nearly level, poorly drained soil is on broad, smooth interstream divides and in oval depressions. Most of the acreage of this soil is forested. A small acreage is in blueberries, row crops, or pasture. The mapped areas are generally as broad as they are long, and they range from 5 to 100 acres.

Typically, the surface layer is dark gray sand 3 inches thick. The subsurface layer is light gray sand 19 inches thick. The subsoil is 24 inches thick. It is dark reddish brown sand in the upper part and black sand in the lower part. The underlying material to a depth of 70 inches is light brownish gray sand.

Permeability is rapid in the upper part of this soil and moderate to moderately rapid in the lower part. This soil is extremely acid to strongly acid throughout, except where the surface layer has been limed. Surface runoff is slow. The seasonal high water table is at or near the surface.

Included in mapping are small areas of Lynn Haven, Cainhoy, and Tomahawk soils, generally near the outer edge of the mapped areas. Also included in some areas are soils that have a hardpan in the lower part of the subsoil. This hardpan restricts root penetration and the downward movement of water. The included soils make up about 10 to 25 percent of the map unit.

This Leon soil is well suited to certain varieties of blueberries, but it is poorly suited to most other local crops. Wetness, sandy texture, and in some places, a thin, dense soil layer within 30 inches of the surface are the main limitations to cropland use.

The dominant trees are loblolly, slash, and longleaf pines (fig. 6). The understory includes creeping bluestem, hairy panicum, pineland threeawn, and inkberry. Wetness is the main limitation to woodland use.

This soil is poorly suited to most urban and recreation uses. Wetness and sandy texture are the main limitations to those uses.

This soil is in capability subclass IVw and woodland group 4w.

Lm—Lumbee sandy loam. This nearly level, poorly drained soil is on smooth flats and in shallow depressions on stream terraces. Most of the acreage of this soil is in woodland. The mapped areas are long and generally narrow and range from 10 to 100 acres.

Typically, the surface layer is dark grayish brown sandy loam 8 inches thick. The subsoil, about 31 inches thick, is grayish brown sandy clay loam in the upper part and gray sandy clay loam in the lower part. The underlying material to a depth of 65 inches is dark gray loamy sand.

In this Lumbee soil, permeability is moderate. This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Surface runoff is very slow. The seasonal high water table is at or near the surface. Low-lying areas are subject to rare flooding.

Included in mapping are a few areas of Johns, Chipley, and Paxville soils. The Johns and Chipley soils are on slightly elevated ridges, and the Paxville soils are intermingled throughout the mapped areas. The included soils make up about 15 percent of this map unit.

Wetness and flooding are the main limitations to the use of this Lumbee soil as cropland. If artificially drained and protected from flooding, this soil is suited to the production of corn, soybeans, and small grains. It is poorly suited to tobacco and cotton crops. Lack of suitable outlets is a limitation to the installation of drainage systems. If open ditches are dug, caving of side walls is also a limitation.

The dominant trees are loblolly pine, slash pine, water tupelo, and sweetgum. The understory includes inkberry, large holly, southern bayberry, switchcane, huckleberry, and blueberry. Wetness is the main limitation to woodland use.

This soil is poorly suited to most urban and recreation uses. Wetness and flooding are the main limitations.

This soil is in capability subclass IIIw and woodland group 2w.

Ln—Lynchburg sandy loam. This nearly level, somewhat poorly drained soil is on broad, smooth uplands. Areas commonly are around the heads of pronounced drainageways and in shallow depressions. About half the acreage of this soil is cultivated. The rest is mainly in woodland or pasture. The mapped areas are 5 to 200 acres.

Typically, the surface layer is dark gray sandy loam 8 inches thick. The subsurface layer is pale brown sandy loam 3 inches thick. The subsoil to a depth of 85 inches is pale brown sandy clay loam in the upper part, gray sandy clay loam in the middle part, and light brownish gray sandy loam in the lower part.

In this Lynchburg soil, permeability is moderate. This soil ranges from extremely acid to strongly acid throughout unless the surface layer has been limed. Surface runoff is slow. The seasonal high water table is 0.5 foot to 1.5 feet below the surface.

Included in mapping are a few small areas of Foreston, Goldsboro, and Rains soils. Areas of these soils generally are less than 5 acres and are along the outer edge of the mapped areas. Typically, only two or three of these included soils are in any one mapped area, and they make up about 20 percent.

If this Lynchburg soil is used for crops, wetness is the main limitation. Tillage might be delayed in spring because of wetness. If drained, this soil is well suited to the production of corn, cotton, and soybeans. Erosion can be a hazard in cultivated areas. Growing winter cover crops and use of crop residue and field borders are the principal practices used in managing cultivated areas of this soil. This soil is well suited to the production of pasture forage crops.

The dominant trees are loblolly pine, slash pine, American sycamore, and sweetgum. The understory includes little bluestem, panicum, common carpetgrass, switchcane, southern bayberry, and large holly.

This soil is poorly suited to most urban and recreation uses. Wetness is the main limitation to those uses.

This soil is in capability subclass IIw and woodland group 2w.

Lu—Lynchburg-Urban land complex. This map unit consists of the nearly level Lynchburg sandy loam and areas of Urban land. It is in built-up areas throughout the county. From 40 to 60 percent is Lynchburg sandy loam, 20 to 40 percent is Urban land, and 15 to 25 percent is other soils.

The somewhat poorly drained Lynchburg soil is in the open areas that have been relatively undisturbed by construction. Typically, the surface layer is dark gray sandy loam 8 inches thick. The subsurface layer is pale brown sandy loam 3 inches thick. The subsoil to a depth of 85 inches is pale brown sandy clay loam in the upper part, gray sandy clay loam in the middle part, and light brownish gray sandy loam in the lower part.

Urban land consists of areas that are covered with impervious materials, such as shopping centers, factories, municipal buildings, apartment complexes, parking lots, and roads. Slope generally has been modified. The extent of site modification varies greatly; some areas have had little disturbance, while others have been reshaped through cutting, grading, and filling.

Figure 6.—Longleaf pine growing on Leon sand.

Included in mapping are small areas of Norfolk, Aycock, Goldsboro, Foreston, Exum, Nahunta, and Rains soils and of open areas that have been reshaped during construction. The inclusions are intermingled throughout the map unit and make up about 15 to 25 percent.

Because of wetness, the Lynchburg soil is poorly suited to cropland. Surface runoff on Urban land is much greater than it is on Lynchburg sandy loam. Recommendations for the use and management of the soil generally require onsite investigation.

This map unit has not been assigned to a capability subclass or a woodland group.

Ly—Lynn Haven sand. This nearly level, poorly drained soil is on broad, smooth uplands, typically on flat areas or in large, shallow, oval depressions. Most of the acreage of this soil is in woodland. The mapped areas are generally oblong or oval and range from 5 to 50 acres.

Typically, the surface layer is black sand 8 inches thick. The subsurface layer is gray sand 4 inches thick. The subsoil to a depth of 70 inches is black sand in the upper part, light gray sand in the middle part, and black sand in the lower part.

In this Lynn Haven soil, permeability is moderate or moderately rapid. This soil ranges from extremely acid to strongly acid throughout. Surface runoff is slow. The seasonal high water table is at or near the surface.

Included in mapping are a few small areas of Leon, Chipley, and Torhunta soils and areas of soils that are similar to this Lynn Haven soil but do not have the gray subsurface layer. Chipley soils are near the outer edge

of the mapped areas. Leon and Torhunta soils are intermingled throughout. The included soils make up between 25 and 40 percent of this map unit.

This Lynn Haven soil is poorly suited to most crops. Wetness and sandy texture are the main limitations.

The dominant trees are loblolly, slash, and longleaf pines. The understory includes bluestem, panicum, threeawn, sawpalmetto, and inkberry. Wetness is the main limitation to woodland use.

This soil is poorly suited to most urban and recreation uses. Wetness is the main limitation to those uses.

This soil is in capability subclass IVw and woodland group 3w.

MaC—Marvyn loamy sand, 6 to 12 percent slopes. This well drained soil is on short side slopes along the more pronounced drainageways on uplands. Most of the acreage of this soil is in woodland. The rest is in cultivated crops or pasture. The mapped areas are long and narrow and are from 5 to about 25 acres.

Typically, the surface layer is brown loamy sand 7 inches thick. The subsurface layer is pale brown loamy sand 8 inches thick. The subsoil is 40 inches thick. It is yellowish brown sandy clay loam in the upper part and strong brown sandy clay loam in the lower part. The underlying material to a depth of 64 inches is strong brown sandy loam.

In this Marvyn soil, permeability is moderate, and available water capacity is moderate. This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Surface runoff is medium.

Included in mapping are a few small areas of soils that have a surface layer more than 20 inches thick. These soils commonly are near the toe slopes. Also included are small areas of Gritney soils and narrow strips of Bibb soils along the drainageways. The included soils make up about 25 percent of each mapped area.

This Marvyn soil is poorly suited to corn, soybeans, tobacco, cotton, and small grains. Slope, surface runoff, and susceptibility to erosion are the main limitations. Growing winter cover crops and use of minimum tillage and crop residue help to control runoff and erosion. This soil is suited to the production of pasture and forage crops.

The dominant trees are loblolly pine, slash pine, and mixed hardwoods. The understory includes little bluestem, broomsedge, flowering dogwood, honeysuckle, panicum, purpletop, and indiangrass.

This soil is suited to most urban and recreation uses. Slope is the main limitation to those uses.

This soil is in capability subclass IIIe and woodland group 2o.

Na—Nahunta loam. This nearly level, somewhat poorly drained soil is in smooth areas, commonly around the heads of shallow drainageways. Most of the acreage of this soil is cultivated. The rest is mainly in pasture and woodland. The mapped areas are oblong and irregular in shape and range from 5 to 50 acres.

Typically, the surface layer is very dark gray loam 2 inches thick. The subsurface layer is pale brown loam 3 inches thick. The subsoil is 67 inches thick. It is pale brown loam in the upper part, pale brown clay loam in the middle part, and gray clay loam in the lower part. The underlying material to a depth of 85 inches is gray clay loam.

In this Nahunta loam, permeability is moderate. This soil is extremely acid to strongly acid throughout, except where the surface layer has been limed. Surface runoff is slow. The seasonal high water table is 1.0 foot to 2.5 feet below the surface.

Included in mapping are a few small areas of Exum, Goldsboro, Grantham, and Lynchburg soils. Lynchburg and Goldsboro soils are near the outer edge of the mapped areas. Exum soils are on slightly elevated ridges, and Grantham soils are in slight depressions. The included soils are less than 4 acres, and they make up about 20 percent of this map unit.

If this Nahunta soil is used for crops, wetness is the main limitation. If drained, this soil is well suited to corn, cotton, soybeans, vegetable crops, tobacco, and small grains. Growing winter cover crops and use of crop residue, field borders, and crop rotations are the main conservation practices used in managing this soil. Artificial drainage is generally required to prevent tobacco from drowning during wet seasons. This soil is well suited to pasture forage crops, such as fescue and Ladino clover.

The dominant trees are loblolly pine, slash pine, American sycamore, and sweetgum. The understory includes American holly, flowering dogwood, greenbrier, low blueberry, and common persimmon. Wetness is the main limitation to woodland use.

This soil is poorly suited to most urban and recreation uses. Wetness is the main limitation.

This soil is in capability subclass IIw and woodland group 2w.

NoA—Norfolk loamy sand, 0 to 2 percent slopes. This well drained soil is on broad, smooth areas on the uplands. Most of the acreage is cultivated. The rest is mainly in pasture or woodland. The mapped areas are 5 to 200 acres.

Typically, the surface layer is grayish brown loamy sand 8 inches thick. The subsurface layer, about 5 inches thick, is very pale brown loamy sand. The subsoil is 70 inches thick. It is yellowish brown sandy clay loam in the upper part and mottled yellowish brown, dark gray, gray, and red sandy clay loam in the lower part. The underlying material to a depth of 99 inches is strong brown sandy loam.

In this Norfolk soil, permeability is moderate, and available water capacity is moderate. This soil is very

strongly acid or strongly acid throughout, except where the surface layer has been limed. Surface runoff is slow. The seasonal high water table is 4 to 6 feet below the surface.

Included in mapping are small areas of Goldsboro and Orangeburg soils, commonly along the outer edge of the mapped areas. Also included are small areas of Wagram soils that are generally less than 3 acres and are intermingled throughout the mapped areas. The included soils make up about 20 to 25 percent of the mapped area.

This Norfolk soil is well suited to the production of cotton, tobacco, corn, soybeans, small grains, and vegetable crops. Growing winter cover crops, minimum tillage, and use of crop residue and field borders are the main conservation practices used in managing this soil. This soil is well suited to the production of pasture forage crops, such as fescue and Ladino clover.

The dominant trees are loblolly and slash pines. The understory includes American holly, flowering dogwood, common persimmon, blueridge blueberry, and greenbrier.

This soil is well suited to most urban and recreation uses. During seasons of high rainfall, wetness may be a problem for septic tank absorption fields.

This soil is in capability class I and woodland group 2o.

NoB—Norfolk loamy sand, 2 to 6 percent slopes. This well drained soil is on slightly rounded parts of low ridges and side slopes on the uplands. Most of the acreage of this soil is cultivated. The rest is mainly in pasture and woodland. The mapped areas are irregularly shaped and are 5 to 200 acres.

Typically, the surface layer is grayish brown loamy sand 8 inches thick. The subsurface layer is very pale brown loamy sand 5 inches thick. The subsoil is 70 inches thick. It is yellowish brown sandy clay loam in the upper part and mottled yellowish brown, dark gray, gray, and red sandy clay loam in the lower part. The underlying material to a depth of 99 inches is strong brown sandy loam.

Permeability is moderate, and available water capacity is moderate. This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Surface runoff is slow. The seasonal high water table is 4 to 6 feet below the surface.

Included in mapping are a few areas of eroded soils that have less than 5 inches of topsoil. Also included are small areas of Orangeburg and Goldsboro soils intermingled with Wagram soils. The Orangeburg soils are along the outer edge of the mapped areas. The areas of Wagram soils generally are less than 3 acres. The included soils make up about 25 percent of this map unit.

This Norfolk soil is well suited to the production of cotton, tobacco, corn, soybeans, small grains, and vegetable crops. The hazard of erosion is the main limitation to cropland use. Growing winter cover crops, minimum tillage, and use of crop residue, field borders, and crop rotations are the main practices used in managing cultivated areas of this soil. This soil is well suited to pasture forage crops, such as fescue and Ladino clover.

The dominant trees are loblolly and slash pines. The understory includes American holly, flowering dogwood, common persimmon, blueridge blueberry, and greenbrier.

This soil is well suited to most urban and recreation uses. During seasons of high rainfall, wetness may be a problem for septic tank absorption fields.

This soil is in capability subclass IIe and woodland group 2o.

NuB—Norfolk-Urban land complex, 0 to 6 percent slopes. This map unit consists of areas of the Norfolk soils and Urban land. From 40 to 60 percent is Norfolk loamy sand, and 15 to 35 percent is Urban land. Soils of minor extent make up the rest.

The well drained Norfolk soils are in the open, relatively undisturbed parts of the map unit. Typically, the surface layer is grayish brown loamy sand 8 inches thick. The subsurface layer is very pale brown loamy sand 5 inches thick. The subsoil is 70 inches thick. It is yellowish brown sandy clay loam in the upper part and mottled yellowish brown, dark gray, gray, and red sandy clay loam in the lower part. The underlying material to a depth of 99 inches is strong brown sandy loam.

Urban land consists of areas that are covered with impervious materials, such as shopping centers, factories, municipal buildings, apartment complexes, parking lots, and roads. Slope generally has been modified. The extent of site modification varies greatly; some areas have had little disturbance, while others have been reshaped through extensive cutting, grading, and filling.

Included in mapping are small areas of Autryville, Aycock, Goldsboro, Lynchburg, Exum, Nahunta, and Wagram soils. Also included are areas that have been graded and reshaped.

This Norfolk soil is well suited to most urban and recreation uses. During seasons of high rainfall, wetness may be a problem for septic tank absorption fields. Surface runoff on the Urban land part of this map unit is much greater than it is on Norfolk loamy sand. Recommendations for the use and management of these soils generally require an onsite investigation.

This unit has not been assigned to a capability subclass or a woodland group.

OrA—Orangeburg loamy sand, 0 to 2 percent slopes. This well drained soil is on smooth, flat uplands. Most of the acreage of this soil is cultivated. The rest is mainly in pasture and woodland. The mapped areas are irregularly shaped and are 5 to 40 acres.

Typically, the surface layer is yellowish brown loamy sand 9 inches thick. The subsoil to a depth of 82 inches is yellowish red sandy clay loam in the upper part and mottled red, reddish yellow, brownish yellow, light gray, and yellow sandy clay loam in the lower part.

In this Orangeburg soil, permeability is moderate, and available water capacity is moderate. This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Surface runoff is slow.

Included in mapping are a few areas of Norfolk and Wagram soils. They are intermingled throughout the mapped areas. The included soils make up about 15 percent of this unit.

This Orangeburg soil is well suited to tobacco, corn, soybeans, cotton, vegetable crops, and small grains. Sprinkler irrigation systems are used in some areas of these crops. Growing winter cover crops, minimum tillage, and use of crop residue and field borders are the main conservation practices. This soil is well suited to pasture forage crops.

The major trees are loblolly and slash pines. The understory includes bluestem and panicum.

This soil is well suited to most urban and recreation uses.

This soil is in capability class I and woodland group 2o.

OrB—Orangeburg loamy sand, 2 to 6 percent slopes. This well drained soil is on side slopes and slightly rounded knolls on uplands in the central part of the county. Most of the acreage of this soil is cultivated. The rest is mainly in pasture and woodland. The mapped areas are elongated or irregularly shaped and are 5 to more than 30 acres.

Typically, the surface layer is yellowish brown loamy sand 9 inches thick. The subsoil to a depth of 82 inches is yellowish red sandy clay loam in the upper part and mottled red, reddish yellow, brownish yellow, light gray, and yellow sandy clay loam in the lower part.

In this Orangeburg soil, permeability is moderate, and available water capacity is moderate. This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Surface runoff is slow.

Included in mapping are a few areas of eroded soils that have less than 5 inches of topsoil. Also included are a few small areas of Norfolk and Faceville soils. The included soils are intermingled throughout each mapped area, and they make up about 20 percent.

This Orangeburg soil is well suited to the production of tobacco, corn, soybeans, cotton, vegetable crops, and small grains. Sprinkler irrigation systems are used in some cropped areas of this soil. The hazard of erosion is the main limitation. Growing winter cover crops, minimum tillage, and use of crop residue help maintain tilth. Conservation practices such as no-tillage and use of field borders and crop rotations that include close-growing crops also help conserve soil and water. This soil is well suited to the production of pasture forage crops, such as fescue and Ladino clover.

The main trees are loblolly and slash pines. The understory includes bluestem and panicum.

This soil is well suited to most urban and recreation uses.

This soil is in capability subclass IIe and woodland group 2o.

Pm—Pamlico muck. This is a nearly level, very poorly drained soil in wide drainageways at the base of the uplands or in shallow depressions on uplands. Most of the acreage of this soil is forested. The rest is mainly in pasture. The mapped areas are nearly circular to oblong and range from 10 to 100 acres.

Typically, the surface layer is muck about 36 inches thick. It is very dark gray in the upper part, black in the middle part, and very dark brown in the lower part. Below the muck to a depth of 60 inches is very dark grayish brown loamy sand.

Permeability is moderate. This soil ranges from extremely acid to strongly acid throughout. Surface runoff is very slow to ponded. The seasonal high water table is at or near the surface. The soil is subject to rare flooding.

Included in mapping are areas where the muck surface is covered with loamy overwash. Also included are areas of Johnston soils and a few areas where the muck is less than 16 inches thick. The included soils are intermingled throughout and make up about 20 percent of this map unit.

This Pamlico soil is poorly suited to cultivated crops unless drained. Wetness and the hazard of flooding are the main limitations. Lack of suitable outlets limits the installation of drainage systems. This soil is poorly suited to pasture forage crops because of low strength and flooding.

The dominant trees are pond pine, water tupelo, and cypress. The understory includes gallberry, huckleberry, greenbrier, waxmyrtle, switchcane, and blueberry. Wetness and flooding are the main limitations to woodland use.

This soil is poorly suited to most urban and recreation uses. Flooding, wetness, and low strength are the main limitations to those uses.

This soil is in capability subclass VIIw and woodland group 4w.

Pn—Pantego loam. This nearly level, very poorly drained soil is in shallow depressions on uplands. Most of the acreage of this soil is in woodland. The rest is mainly in pasture or cultivated crops. The mapped areas are generally oblong and range from 5 to about 20 acres.

Typically, the surface layer is loam 13 inches thick. It is black in the upper part and very dark gray in the lower part. The subsoil is 51 inches thick. The upper part is

dark gray sandy clay loam, the middle part is grayish brown sandy clay loam, and the lower part is gray sandy clay loam. The underlying material to a depth of 85 inches is light gray sandy loam.

In this Pantego soil, permeability is moderate. This soil ranges from extremely acid to strongly acid throughout, except where the surface layer has been limed. Surface runoff is very slow or ponded. The seasonal high water table is at or near the surface.

Included in mapping are small areas of Rains, Woodington, Torhunta, and Toisnot soils. The included soils are on the outer edge of the mapped areas, and they make up about 20 percent.

This Pantego soil is poorly suited to crop production. Wetness and seepage are the main limitations. Tillage is normally delayed in the spring because of wetness. If drained, this soil is well suited to the production of vegetable crops, corn, soybeans, and small grains. It is poorly suited to cotton and tobacco. This soil normally can be drained with tile if an outlet is available. Lack of suitable outlets commonly is a limitation to the installation of drainage systems. Drainage and use of crop residue are the main practices used in managing cultivated areas of this soil. This soil is well suited to forage crops, such as fescue and Ladino clover.

The dominant trees are loblolly and slash pines. The understory includes inkberry, large holly, sweetbay, greenbay, and red maple. Wetness is the main limitation to woodland use.

This soil is poorly suited to most urban and recreation uses. Wetness is the main limitation.

This soil is in capability subclass VIw and woodland group 1w.

Px—Paxville fine sandy loam. This nearly level, very poorly drained soil is on smooth flats and in slight depressions on stream terraces. Most of the acreage of this soil is in woodland. The rest is in pasture and cultivated crops. The mapped areas are oblong and range from 5 to 50 acres.

Typically, the surface layer is black fine sandy loam 14 inches thick. The subsoil is 44 inches thick. It is very dark gray sandy clay loam in the upper part, dark gray sandy clay loam in the middle part, and very dark gray and dark gray sandy clay loam in the lower part. The underlying material to a depth of 80 inches is gray loamy sand and sand.

In this Paxville soil, permeability is moderate. This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Surface runoff is slow or ponded. The seasonal high water table is at or near the surface during much of the year. Occasionally, some areas are flooded during periods of high rainfall.

Included in mapping are small areas of Roanoke, Torhunta, and Lumbee soils, which are intermingled throughout the mapped areas. These included soils commonly make up about 20 percent of this map unit.

Wetness is the main limitation to use of this Paxville soil as cropland. If drained, this soil is suited to corn, soybeans, vegetable crops, and small grains. Even if drained, the soil is poorly suited to cotton and tobacco. Drainage and use of crop residue are the main practices used in managing cultivated areas of this soil. This soil normally can be drained with tile if an outlet is available. Lack of suitable drainage outlets commonly is a limitation to the installation of drainage systems. Drained areas of this soil are well suited to the production of pasture forage crops, such as fescue and Ladino clover.

The dominant trees are loblolly pine, slash pine, sweetgum, and American sycamore. The understory includes bluestem and panicum. Wetness is the main limitation to woodland use.

This soil is poorly suited to most urban and recreation uses. Wetness is the main limitation.

This soil is in capability subclass IIIw and woodland group 1w.

Ra—Rains sandy loam. This nearly level, poorly drained soil is on broad, smooth uplands and in shallow depressions near drainageways. It is in most parts of the county. About half the acreage of this soil has been cleared and is cultivated. The rest is in woodland and pasture. The mapped areas are generally as broad as they are long and range from 5 to 200 acres.

Typically, the surface layer is very dark gray sandy loam 3 inches thick. The subsurface layer is grayish brown sandy loam 2 inches thick. The subsoil is 71 inches thick. It is gray sandy loam in the upper part and gray sandy clay loam in the lower part. The underlying material to a depth of 96 inches is gray sandy loam.

In this Rains soil, permeability is moderate. This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Surface runoff is slow to ponded. The seasonal high water table is at or near the surface.

Included in mapping are small areas of Woodington, Coxville, Lynchburg, Pantego, and Torhunta soils. The Pantego, Coxville, and Woodington soils are scattered throughout the areas mapped. The Lynchburg soils generally are along an edge of the area. The included soils make up about 25 percent of this map unit.

Wetness is the main limitation to use of this Rains soil as cropland. If drained, this soil is well suited to corn, soybeans, vegetable crops, and small grains. It is poorly suited to cotton and tobacco. Drainage and use of crop residue are the main practices used in managing cultivated areas of this soil. This soil normally can be drained with tile if an outlet is available. Lack of suitable drainage outlets commonly is a limitation to the installation of drainage systems. This soil is well suited to pasture forage crops, such as fescue and Ladino clover.

The dominant trees are loblolly pine, slash pine, sweetgum, and American sycamore. The understory includes little bluestem, panicum, threeawn, switchgrass,

large holly, and toothachegrass. Wetness is the main limitation to woodland use.

This soil is poorly suited to most urban and recreation uses. Wetness is the main limitation.

This soil is in capability subclass IVw and woodland group 2w.

Ro—Roanoke loam. This nearly level, poorly drained soil is on stream terraces. Most of the acreage of this soil is in woodland. The rest is in pasture or cultivated crops. The mapped areas are generally longer than they are broad and range from 5 to 100 acres.

Typically, the surface layer is dark gray loam 4 inches thick. The subsoil is 52 inches thick. It is gray clay loam in the upper part, gray clay in the middle part, and dark gray clay loam and sandy clay loam in the lower part. The underlying material to a depth of 72 inches is dark gray sandy loam.

In this Roanoke soil, permeability is slow, and shrink-swell potential is moderate. This soil is very strongly acid or strongly acid. Surface runoff is slow. Unless the soil is drained, the seasonal high water table is at or near the surface. This soil is subject to rare flooding.

Included in mapping are small areas of Johns, Lumbee, and Torhunta soils, which are intermingled throughout. Typically, only one or two of the included soils are in any one mapped area, and they make up about 15 percent.

Wetness and flooding are the main limitations to use of this Roanoke soil as cropland. If drained, this Roanoke soil is suited to selected crops, such as corn, soybeans, and small grains. It is poorly suited to tobacco and cotton. Adequate drainage may be difficult to obtain because of slow permeability and lack of suitable outlets. Drainage and use of crop residue are the main practices used in managing cultivated areas of this soil. Because of the clayey subsoil, the time period is short when the soil is dry enough to be cultivated. This soil responds poorly to tile drainage.

The dominant trees are loblolly and slash pines. The understory includes bluestem. Wetness is the main limitation to woodland use.

This soil is poorly suited to most urban and recreation uses. Wetness, flooding, moderate shrink-swell potential, and slow permeability are the main limitations.

This soil is in capability subclass IIIw and woodland group 2w.

Tn—Toisnot fine sandy loam. This nearly level, poorly drained soil is around the heads of shallow drainageways and around the edge of large bays in most parts of the county. Most of the acreage of this soil is in woodland; the rest is mainly in pasture. The mapped areas are generally as broad as they are long and range from 5 to 50 acres.

Typically, the surface layer is very dark gray fine sandy loam 5 inches thick. The subsurface layer is grayish brown fine sandy loam 11 inches thick. The subsoil is 56 inches thick. It is gray sandy loam in the upper part, light gray loamy sand with a dense hardpan in the middle part, and white sandy clay loam in the lower part. The underlying material to a depth of 85 inches is light gray sandy loam and loamy sand.

Permeability is slow. This soil ranges from extremely acid to strongly acid throughout unless the surface layer has been limed. Unless the soil is drained, the seasonal high water table is at or near the surface. Surface runoff is slow to ponded.

Included in mapping are small areas of Rains, Woodington, Torhunta, and Bibb soils. Bibb soils are along shallow drainageways. The other included soils are intermingled throughout the mapped areas. The included soils do not have a brittle subsoil. They make up about 20 percent of this map unit.

This Toisnot soil is poorly suited to crop production. Wetness and the dense hardpan in the subsoil are the main limitations. Drainage for crop production is not practical. Root development is restricted to the sandy soil layers that lie above the hardpan, and if these layers are drained, they would have low available water capacity. Benefits from fracturing the hardpan are questionable since it is likely to reform within a few years. Lack of suitable drainage outlets is a limitation in some areas. This soil is suited to pasture forage crops, such as fescue and Ladino clover.

The dominant trees are sweetgum, slash pine, and loblolly pine. The understory includes sweetbay, inkberry, large holly, greenbrier, switchcane, and southern bayberry. Wetness is the main limitation to woodland use.

This soil is poorly suited to most urban and recreation uses. Wetness and the cemented pan are the main limitations.

This soil is in capability subclass IVw and woodland group 3w.

To—Tomahawk sand. This nearly level, somewhat poorly drained or moderately well drained soil is on smooth uplands. Most of the acreage of this soil is cultivated. The rest is mainly in woodland and pasture. Areas are irregular in shape and range from 5 to more than 100 acres.

Typically, the surface layer is very dark gray sand 4 inches thick. The subsurface layer is pale brown sand 20 inches thick. The subsoil is 18 inches thick. It is light yellowish brown sandy loam in the upper part and pale brown sandy loam in the lower part. The underlying material to a depth of 80 inches is very dark grayish brown loamy sand in the upper part, dark reddish brown sand in the middle part, and black sand in the lower part.

Permeability is moderately rapid. This soil is very strongly acid or strongly acid in the upper part and very strongly acid to slightly acid in the lower part. Surface

runoff is slow. The seasonal high water table is 1.5 to 3.5 feet below the surface.

Included in mapping are small areas of Cainhoy and Leon soils. Cainhoy soils are on narrow mounds on the slightly higher positions, and the Leon soils are in slight depressions. The included soils make up about 20 percent of this map unit.

Wetness is the main limitation to use of this Tomahawk soil as cropland. If drained, this soil is suited to corn, soybeans, small grains, tobacco, and cotton. Artificial drainage is generally required to prevent tobacco from drowning during wet seasons. Drainage and use of crop residue are the main practices used in managing cultivated areas of this soil. This soil is suited to pasture forage crops.

The dominant trees are loblolly pine, slash pine, yellow-poplar, American sycamore, and sweetgum. The understory includes inkberry, large holly, huckleberry, pineland threeawn, southern bayberry, blueberry, turkey oak, common sassafras, and common persimmon.

This soil is poorly suited to most urban and recreation uses. Wetness and a sandy surface layer are the main limitations.

This soil is in capability subclass IIw and woodland group 3w.

Tr—Torhunta fine sandy loam. This nearly level, very poorly drained soil is on smooth upland bays and stream terraces. Most of the acreage of this soil is in woodland. The rest is mainly in pasture and cultivated crops. The mapped areas commonly range from 25 to several hundred acres.

Typically, the surface layer is 16 inches thick. The upper part is black fine sandy loam, and the lower part is very dark gray sandy loam. The subsoil is gray sandy loam 29 inches thick. The underlying material to a depth of 80 inches is gray loamy sand in the upper part and light gray loamy sand in the lower part.

The seasonal high water table is near the surface for several months during the year. When the water table is low, water moves through the subsoil at a moderately rapid rate. This soil ranges from extremely acid to strongly acid unless limed. Because this soil is in slight depressions, surface runoff is slow to ponded.

Included in mapping are small areas of Rains, Woodington, Paxville, and Lynn Haven soils. Most of the included soils are in the mapped areas of this Torhunta soil that commonly are adjacent to areas dominated by these soils. These soils make up about 20 percent of this map unit.

On this Torhunta soil, water oak and pond pine are the major trees that provide a canopy. Some areas contain loblolly pine, American sycamore, and sweetgum. American cyrilla, blackgum, gallberry, greenbrier, sweetbay, pineland threeawn, large holly, and southern bayberry are in the understory. Wetness is the main limitation.

Surface and subsurface drainage is needed before this soil can be used for cultivated crops or pasture. If drained, this soil is suited to a few locally grown crops, chiefly corn, soybeans, small grains, and blueberries. The sandy substratum causes ditchbanks to be unstable. This unstable condition and the lack of suitable outlets are limitations to the installation and maintenance of drainage systems.

This soil is poorly suited to urban development and recreation uses. Wetness is the main limitation.

This soil is in capability subclass IIIw and woodland group 2w.

UD—Udorthents, loamy. This map unit consists of borrow areas and landfill areas, where most or all of the natural soil material has been altered by digging, grading, or filling.

Borrow pits are excavated areas where the soil material has been removed for use as fill for construction purposes. The cuts are 4 to more than 10 feet deep. In these cuts the base slope is level to gently sloping, and most cuts have two or more short, nearly vertical side slopes. The surface layer is exposed in places and consists mainly of dense loamy marine deposits. These areas commonly range from 3 to 30 acres. Areas less than 3 acres in size are shown by a special symbol on the soil map.

Included with the borrow areas in mapping are small areas that are ponded intermittently and small areas of excavated material.

Some of the borrow pits have been seeded to grass. A few areas are naturally reseeded to wild grasses, weeds, and loblolly pine. The soils are poorly suited to plant growth because of the unfavorable properties of the soil, low fertility, and low available water capacity.

Landfill areas are excavated areas where the natural soil material has been altered by landfill operations. They consist of graded trenches that are backfilled with alternate layers of solid refuse and soil material. The surface has a final cover of about 2 feet of soil material. After the final cover is added, the surface ranges from nearly level to gently sloping.

Included in mapping are areas of undisturbed soil, commonly near the edge of the mapped areas. The soil between the trenches is relatively undisturbed, except for the final cover used to smooth the entire area.

In landfill areas the soil material is suited to plant growth. Available water capacity is generally low. A permanent vegetative cover is essential to protect the soil from erosion.

The characteristics of Udorthents within these mapped areas vary to such a degree that onsite examinations of the soil are needed before interpretations can be made.

No capability subclass or woodland group has been assigned.

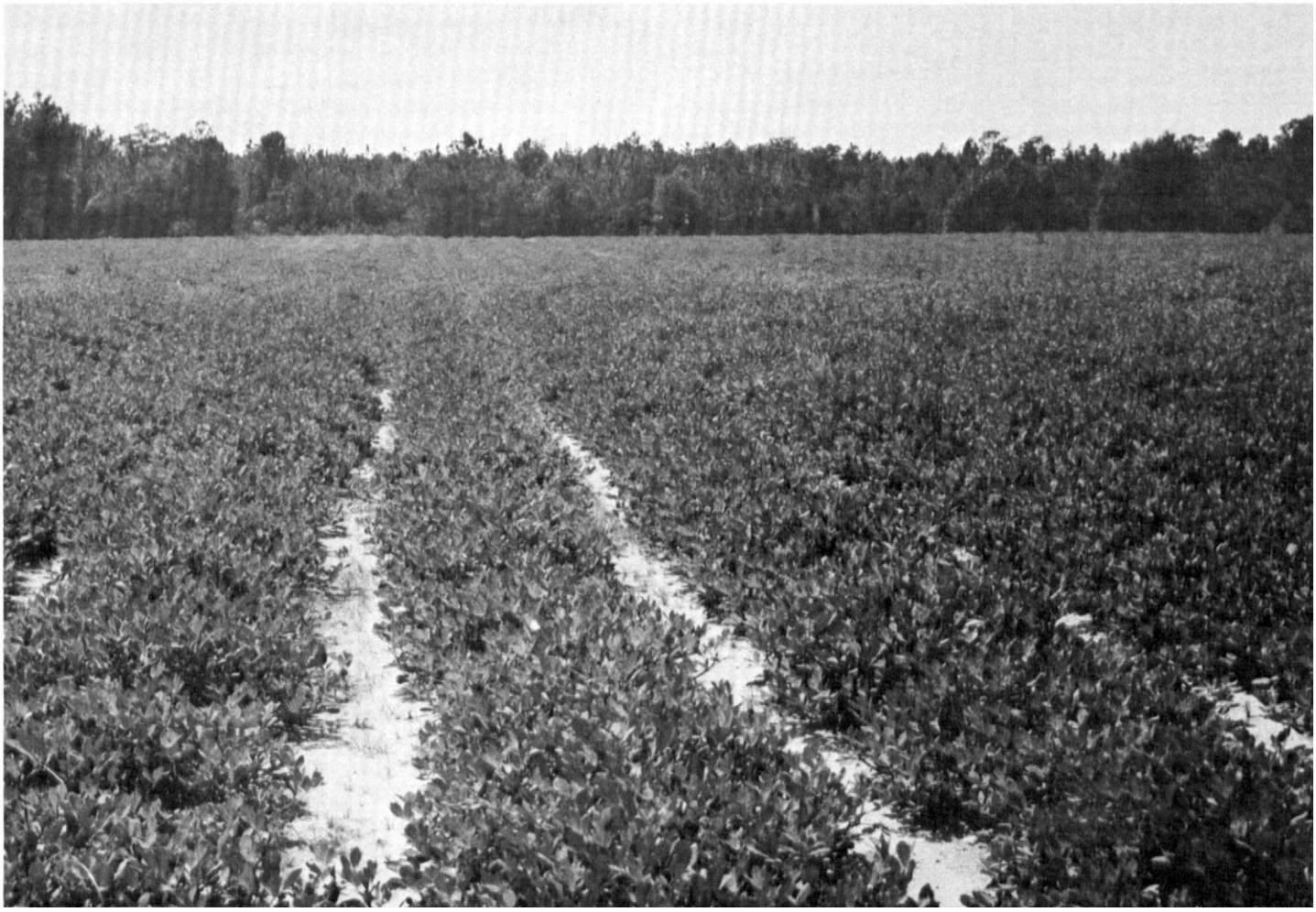


Figure 7.—Peanuts growing on Wagram loamy sand, 0 to 6 percent slopes.

WaB—Wagram loamy sand, 0 to 6 percent slopes. This well drained soil is in broad areas on the uplands. Most of the acreage of this soil is cultivated. The rest is in pasture and woodland. The mapped areas are irregular in shape and range from 10 to about 200 acres.

Typically, the surface layer is grayish brown loamy sand 7 inches thick. The subsurface layer is pale brown loamy sand 21 inches thick. The subsoil to a depth of 99 inches is yellowish brown sandy clay loam in the upper part and brownish yellow sandy clay loam in the lower part.

Permeability is moderate in this Wagram soil, and available water capacity is moderate. This soil is very strongly acid or strongly acid unless limed. Surface runoff is slow.

Included in mapping are small areas of Autryville and Blanton soils on the outer edge of the mapped areas. Also included are small intermingled areas of Norfolk, Orangeburg, and Goldsboro soils and short, narrow strips of Bibb soils along the drainageways. Typically, only two or three of the included soils are in any one delineation, and they make up between 25 and 35 percent.

This Wagram soil is suited to the production of tobacco, corn, soybeans, vegetable crops, peanuts (fig. 7), small grains, sweetpotato, and watermelons. Leaching of plant nutrients, soil blowing, and low available water capacity are the main limitations. Minimum tillage, the use of cover crops, and the use of crop residue are practices that help control soil blowing and reduce leaching. This soil is well suited to Coastal bermudagrass and bahiagrass.

The dominant trees are loblolly pine, slash pine, and longleaf pine. The understory includes American holly, flowering dogwood, common persimmon, and greenbrier.

This soil is droughty, and the thick, sandy surface layer is the main limitation to woodland use.

This soil is well suited to most urban uses. Lawns and shrubs may be difficult to maintain because of droughtiness. This soil is suited to most recreation uses. The thick, sandy surface layer is the main limitation to recreation uses.

This soil is in capability subclass IIs and woodland group 3s.

Wo—Woodington loamy sand. This nearly level, poorly drained soil is on smooth uplands. Most of the acreage of this soil is in woodland. The rest is cultivated or in pasture. The mapped areas are generally as broad as they are long, and they range from 10 to 50 acres.

Typically, the surface layer is very dark gray loamy sand 5 inches thick. The subsurface layer is light brownish gray loamy sand 5 inches thick. The subsoil is 55 inches thick. The upper part is gray sandy loam, and the lower part is light brownish gray sandy loam. The underlying material to a depth of 70 inches is light brownish gray loamy sand.

Unless this Woodington soil is drained, the seasonal high water table is near the surface for several months during the year. When the water table is low, permeability throughout the subsoil is moderately rapid. This soil ranges from extremely acid to strongly acid. Because the surface is nearly level to slightly depressional, runoff is slow to ponded.

Included in mapping are a few areas of Foreston, Torhunta, Rains, and Toisnot soils. The Foreston soils are on the slightly elevated areas, and the rest of the soils are near the outer edge of this unit. The included soils make up about 25 percent of this map unit.

Surface and subsurface drainage is needed if this Woodington soil is cultivated or in pasture. If drained, this soil is suited to a few locally grown crops, chiefly corn, soybeans, and small grains. It is poorly suited to tobacco and cotton. Where the lower part of the subsoil is sandy, the ditchbanks are unstable. This instability and the lack of suitable outlets are limitations in installation and maintenance of drainage systems.

Water oak and pond pine are the major canopy trees in undrained areas. Loblolly pine, yellow-poplar, American sycamore, and sweetgum are common in drained or partly drained areas. American holly, blackgum, gallberry, greenbrier, and sweetbay are the common understory species. Wetness is the main limitation to woodland use.

This soil is in capability subclass IIIw and woodland group 3w.

Important Farmland

With land use changing constantly, public interest in the productive capacity of America's farmlands has increased. To provide information about the farmland in Sampson County, the soils are identified that have a good potential for food and fiber production. These soils are grouped into "Prime Farmland" and "Additional Farmland of State and Local Importance." About 478,380 acres, or about 78 percent of the land in the county, is in these two categories.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in providing the nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, state, and federal levels, as well as individuals, must encourage and facilitate the wise use of our nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to producing food, feed, forage, fiber, and oilseed crops. Such soils have properties that are favorable for the economic production of sustained high yields of crops. The soils need only to be treated and managed using acceptable farming methods. The moisture supply, of course, must be adequate, and the growing season has to be sufficiently long. Prime farmland soils produce the highest yields with minimal inputs of energy and economic resources, and farming these soils results in the least damage to the environment.

Prime farmland soils may presently be in use as cropland, pasture, or woodland, or they may be in other uses. They either are used for producing food or fiber or are available for these uses. Urban or built-up land and water areas cannot be considered prime farmland.

Prime farmland soils usually get an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not flooded during the growing season. The slope ranges mainly from 0 to 6 percent.

About 172,854 acres, or about 28 percent of Sampson County, meets the soil requirements for prime farmland. This farmland is mainly in the central and northern parts of the county. Map units 2 and 4 on the general soil map contain a significant acreage of these soils. The main crops are cotton, tobacco, pepper, cucumber, squash, eggplants, green beans, tomatoes, corn, and soybeans.

The map units, or soils, that make up prime farmland in Sampson County are listed in this section. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps in the back of the publication. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units."

The soils identified as prime farmland are:

AyB Aycock silt loam, 1 to 4 percent slopes
ExA Exum silt loam, 0 to 2 percent slopes
FaA Faceville fine sandy loam, 0 to 2 percent slopes
FaB Faceville fine sandy loam, 2 to 6 percent slopes
Fo Foreston loamy sand
Go Goldsboro loamy sand, 0 to 2 percent slopes
Jo Johns fine sandy loam
KaA Kalmia loamy sand, 0 to 3 percent slopes
NoA Norfolk loamy sand, 0 to 2 percent slopes
NoB Norfolk loamy sand, 2 to 6 percent slopes
OrA Orangeburg loamy sand, 0 to 2 percent slopes
OrB Orangeburg loamy sand, 2 to 6 percent slopes

Additional Farmland of State and Local Importance

About 305,526 acres, or nearly 50 percent of Sampson County, meets the requirements for farmland of state and local importance. The areas are scattered throughout the county. The main crops are watermelons, peanuts, asparagus, cucumbers, corn, soybeans, and Coastal bermudagrass.

Farmland of state and local importance is important to the agriculture of Sampson County. In one or more ways, the soil characteristics do not meet the requirements of prime farmland. Crop selection is limited and more management is required because these soils are sloping, naturally wet, or droughty. Yet, these are productive and have the potential needed to realize good yields under good management.

The soils in the following list are identified as farmland of state and local importance:

Au Autryville loamy sand, 0 to 6 percent slopes
BoB Blanton sand, 0 to 6 percent slopes
CaB Cainhoy sand, 0 to 5 percent slopes
ChA Chipley sand, 0 to 2 percent slopes
Co Coxville loam[1]
Gr Grantham loam
Lm Lumbee sandy loam
Ln Lynchburg sandy loam[1]
Na Nahunta loam[1]
Pn Pantego loam
Px Paxville fine sandy loam
Ra Rains sandy loam[1]
Ro Roanoke loam
Tn Toisnot fine sandy loam
To Tomahawk sand
Tr Torhunta fine sandy loam
WaB Wagram loamy sand, 0 to 6 percent slopes
Wo Woodington loamy sand

[1] The wet soils that are adequately drained meet the definition of prime farmland.

Leon and Lynn Haven soils (about 35,397 acres) are suited to commercial blueberries; however, only about 200 acres of these soils is presently used for blueberries.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and suitabilities of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the suitabilities and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand, roadfill, and topsoil. They can use it to identify areas where wetness or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

Foy D. Hendrix, conservation agronomist, Soil Conservation Service, Raleigh, North Carolina, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the North Carolina Agricultural Extension Service.

More than 181,000 acres in the survey area was used for crops and pasture in 1978, according to the Census of Agriculture Preliminary Report (*9*). Of that, about 13,000 acres was used for hay and pasture and about 168,000 acres for row crops, mainly tobacco, corn, soybeans, cotton, small grains, and truck crops. Corn for grain took up 63,200 acres; soybeans, 56,353 acres; truck crops, 12,877 acres; tobacco, 12,433 acres; and sweetpotatoes, 5,435 acres. All other crops plus idle cropland took up 17,708 acres.

Agriculture has had and will continue to have an important role in Sampson County's economy. Suitable soils and a favorable climate contribute to the production of corn, tobacco, soybeans, pepper, cucumbers, sweetpotatoes, and cotton.

Total acreage of cropland has gradually been increasing as more and more woodland is cleared. Around the perimeter of towns, however, the cropland acreage is decreasing as urban use increases. The use of this soil survey to help make land use decisions that may influence the future role of farming in the survey area is described in the section "General Soil Map Units."

Farms in Sampson County are following a nationwide pattern in physical change. The average farm is becoming larger, and the total number of farms is diminishing. Farmers are increasing their acreage by using more and larger farm machinery and other advancements in agricultural technology.

Cropland Management

The well drained, nearly level to gently sloping soils that have a surface layer of loamy sand, fine sandy loam, or silt loam are the choice soils used to produce crops. These soils include Aycock, Norfolk, Faceville, Orangeburg, Goldsboro, and Exum soils.

Corn and soybeans are planted on a variety of soils, such as the deep, droughty sandy soils near the community of Autryville; the deep silty soils near

Roseboro; and the broad, flat, nearly level, poorly drained soils near Ivanhoe. Wheat and other grain crops are planted primarily for winter cover crops. When small grains are grown for grain, soybeans usually follow.

Vegetable crops are suited to most of the soils in the county. Vegetable production is increasing, and vegetables currently occupy about 8 percent of the cropland in the county. Proper irrigation is important in producing good-quality vegetables.

The major problem in vegetable production is the inability to obtain good stands. Very strongly acid or strongly acid soils, nematodes, and inadequate soil moisture result in low seed germination and seedling survival rates. Seedbed preparation and timeliness are special considerations if vegetable crops are planted. Seeds planted too early have a high mortality rate because of cold soil temperatures. The average yields per acre that can be expected of the major truck crops under a high level of management are shown in table 5.

Most of the soils used as cropland are limited by such conservation problems as poor drainage, erosion hazard, or droughty sands. About 10 percent of the cropland is without any particular conservation problem. Continuous production of crops is common on such soils as Norfolk, Orangeburg, Faceville, Exum, and Goldsboro.

Water erosion is a major concern on about 15 percent of the cropland. If slope is more than 2 percent, erosion is a hazard. Norfolk, Aycock, Orangeburg, and Faceville soils with slopes of 2 to 6 percent are subject to moderate erosion. Marvyn and Gritney soils have slopes of 4 to 12 percent, and in cultivated areas of these soils the erosion hazard is severe.

Loss of the surface layer through erosion is damaging for two reasons. First, productivity generally is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on soils, such as Gritney, that have a clayey subsoil.

Second, soil erosion results in sedimentation of streams. Control of erosion minimizes sedimentation of streams and improves the quality of water for municipal use, for recreation, and for fish and wildlife.

In areas of some gently sloping soils, tilling or preparing a good seedbed is difficult because the original friable surface soil has been eroded. Small eroded spots are common in mapped areas of Norfolk, Aycock, Orangeburg, and Faceville soils.

Erosion control practices that provide a protective surface cover, reduce runoff, and increase infiltration will reduce soil loss. A cropping system that keeps a vegetative cover on the soil for extended periods can help reduce soil losses by erosion to amounts that will not reduce soil productivity.

Terraces, diversions, contouring, and contour stripcropping are recommended erosion control practices in the county. They are best adapted to soils that have smooth, uniform slopes, including most areas of the gently sloping Aycock, Faceville, Norfolk, and Orangeburg soils.

Short and irregular slopes make contour tillage and terracing impractical in most areas of the sloping Gritney and Marvyn soils. On these soils, a cropping system that provides substantial vegetative cover is needed to control erosion. Minimizing tillage and leaving crop residue on the surface help increase infiltration and reduce the hazards of runoff and erosion. These practices can be adapted to most soils in the county.

Soil blowing is a hazard on the sandy Blanton, Cainhoy, Autryville, and Wagram soils. Soil blowing can damage the young crops on these soils in a few hours if winds are strong and the soil surface is dry and without cover. Maintaining vegetative cover, use of windbreaks, stripcropping, leaving mulch on the surface, or roughening surfaces by proper tillage minimizes soil blowing. These sandy soils are droughty when rainfall is limited during the growing season. Mulches aid in maintaining soil moisture.

A compacted traffic pan (fig. 8) is between the topsoil and subsoil in many soils in Sampson County. These pans reduce root penetration and permeability. Runoff can increase during prolonged rains after the soil above the pan is saturated. The erosion hazard is greater on sloping soils with traffic pans. Conservation tillage systems using rippers, subsoilers, and chisels are effective in temporarily breaking up the pan in Norfolk, Autryville, Wagram, and Aycock soils. The occurrence and density of the traffic pan in these soils increase with the number of times equipment is used on a site per crop season.

Soil drainage is the major management need on about 45 percent of the acreage used for crops and pasture in the county. Some soils are so wet that growing crops common to the area generally is not possible without artificial drainage. These wet soils are the poorly drained and very poorly drained Coxville, Grantham, Roanoke, Lumbee, Pantego, Rains, Toisnot, and Woodington soils.

Unless artificially drained, the somewhat poorly drained soils are so wet that crops are damaged in most years. Such soils are the Johns, Lynchburg, and Foreston soils.

The moderately well drained Exum, Goldsboro, and Chipley soils tend to dry out slowly after rains. These soils include small wet areas around natural drainageways and in depressions on the broad, flat landscapes. Artificial drainage is needed to drain these areas.

The design of both surface and subsurface drainage systems may differ with the soil. A combination of surface drainage and tile drainage is needed in most areas of the poorly drained and very poorly drained soils used for intensive rowcropping. Tile drains have to be more closely spaced in slowly permeable soils, such as Nahunta, Coxville, and Grantham, than in more permeable soils, such as Lynchburg and Rains.

Figure 8.—Profile of Norfolk loamy sand, 0 to 2 percent slopes. This soil commonly develops a traffic pan, which tends to restrict water movement and development of roots. The pan ranges from 1 to 3 inches in thickness.

Soil fertility. None of the soils in Sampson County have enough natural fertility to produce economic returns on crops. They are naturally acid and require additions of lime to make them usable for most crops.

Liming requirements are perhaps the farmer's first concern because the acidity of the soil affects the availability of many nutrient elements and the activity of beneficial bacteria. Lime provides calcium, also magnesium if dolomitic lime is used. The addition of lime neutralizes exchangeable aluminum and thereby counteracts the adverse effects aluminum has on many important crops grown in the county.

Liming requirements are based upon soil test determinations. In soils that have a sandy surface texture, not only the available calcium level may be low but also magnesium. A guide to use in calcitic or dolomitic liming can be obtained only by soil testing. Also, the desired pH levels differ depending upon the soil properties and the crop to be grown. Such differences are considered in the recommendations available through soil testing.

Nitrogen is required for all crops. Application of nitrogen generally is not required for peanuts, clovers, and in some rotations of soybeans. No soil test is available for predicting nitrogen requirements. Appropriate rates are discussed in the section "Yields Per Acre." Because nitrogen can be readily leached from sandy soils, it may be necessary to apply nitrogen on these soils more than once during the growing season.

The need for phosphorous fertilizers can be predicted from soil tests. It is necessary to determine phosphate requirements for specific crops by sampling each field and obtaining the soil test recommendations. In Sampson County, it is particularly important to have a soil test of each field to determine phosphate requirements because past fertilizer applications tend to build up in the soil. Potassium needs are also determined by soil tests.

Chemical weed control. The use of herbicides for weed control in crops is a common practice in Sampson County. Successful use results in less tillage and is an integral part of modern farming. Selected soil properties, such as organic matter content and texture of the surface layer, affect the rate of herbicide application. Estimates for both of these properties were determined for the soils described in this survey. Table 16 shows a general range of organic matter content. The surface texture is shown in table 15 in the "USDA texture" column.

Rapid leaching of herbicides may damage young plants or prevent normal seed germination in sandy soils containing less than 2 percent organic matter. The effectiveness of herbicides commonly decreases as the organic matter content exceeds 6 to 10 percent.

For specific herbicide rates, according to the organic matter content and surface texture, read the label before application.

In some cases, the organic matter content for a specific soil may range outside that shown in table 16. The higher ranges may occur in soil areas that have received large amounts of animal or manmade waste. Soils currently being brought into cultivation may contain higher levels of organic matter in their surface layer than like soils that have been cultivated for a long period. Conservation tillage may also increase the organic matter content in the surface layer. Lower levels of organic matter are common in soils where the surface layer has been partly or completely removed by erosion, land smoothing, or other activities. Other activities may also affect the organic matter content for a given soil. Current soil tests should be used for determination of specific organic matter content.

Pasture Management

Pastureland consists mainly of two types: (1) fescuegrass and clover pastures on somewhat poorly drained to poorly drained Rains, Lynchburg, Grantham, and Coxville soils; and (2) Coastal bermudagrass pastures on sandy soils, such as Autryville, Wagram, Blanton, and Cainhoy. The amount of land used as pastureland is decreasing because of the trend toward row crops. Soil test recommendations are needed for initial establishment of these pastures. Proper management, including liming, fertilizing, and weed control, is recommended for maximum production.

Coastal bermudagrass used for hay production requires a high level of fertilization. Pure sprig sources are important for initial establishment.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. Table 5 shows the average yields per acre that can be expected of truck crops under a high level of management. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green-manure crops; harvesting that insures the smallest possible loss; and timeliness of all fieldwork.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the North Carolina Agricultural Extension Service can provide information about the management and productivity of the soils for those crops.

Maintenance of proper soil reaction and fertility levels should be based on standard soil tests. Nitrogen rates for corn on soils that have a yield potential of 125 to 150 bushels per acre should be 140 to 160 pounds per acre. Where the yield potential is only 100 bushels per acre, rates of 100 to 120 pounds of nitrogen per acre should be used. Application of nitrogen in excess of that needed to realize potential yields is not usually a sound practice. The use of excess fertilizer on cropland causes water pollution and is expensive. Where corn or cotton follows harvested soybeans or peanuts, nitrogen rates can be reduced 20 to 30 pounds per acre.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. These levels are defined in the following paragraphs.

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

Class I soils have few limitations that restrict their use.

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

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

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

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w,* or *s,* 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 (in some soils the wetness can be partly corrected by artificial drainage); and *s* shows that the soil is limited mainly because it is shallow or droughty.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w* or *s,* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-4 or IIIe-6.

The acreage of soils in each capability class and subclass is shown in table 7. The capability classification of each map unit is given in the section "Detailed Soil Map Units."

Woodland Management and Productivity

Edwin J. Young, state staff forester, Soil Conservation Service, and Tommy Glover, Agricultural Extension Service, Sampson County, helped prepare this section.

Forest land is of economic, social, recreational, and environmental importance to Sampson County. Commercial forest land covers 59 percent of the land area, or approximately 358,600 acres (*7*). It is estimated that more than half of the forested acreage harvested annually in the county receives no reforestation or stand improvement. Much of the acreage harvested in the county is high-graded timber, or it is cut mainly for pulpwood, resulting in a poorly stocked residual stand of timber.

A forest survey (*7*) conducted by the Forest Service of the U.S. Department of Agriculture identifies five forest types in Sampson County. They are: *loblolly-shortleaf pine* (123,346 acres), which is more than 50 percent of these species with associated oaks, hickory, and gum; *longleaf-slash pine* (16,566 acres), of which longleaf and slash pines, singly or in combination, make up more than 50 percent of the stocking; *oak-pine* (73,727 acres), in which upland oaks, gum, hickory, and yellow-poplar make up more than 50 percent of the stocking, but pines make up 25 to 50 percent; *oak-hickory* (59,440 acres) in which upland oaks and hickory make up more than 50 percent of the stocking and common associates include elm, maple, yellow-poplar, and black walnut; and *oak-gum-cypress* (85,490 acres) bottom-land forests in which tupelo, blackgum, sweetgum, oak, and southern cypress, singly or in combination, make up a plurality of the stocking. Common associates in the oak-gum-cypress forests include cottonwood, willow, ash, elm, hackberry, and maple.

Table 8 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination (woodland suitability) symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *w* indicates excessive water in or on the soil; and *s*, sandy texture. The letter *o* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: w and s.

In table 8, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index.* This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. Site index (*6*) was determined at age 30 years for eastern cottonwood, 35 years for American sycamore, and 50 years for all other species. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement

cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suited to the soils and to commercial wood production.

Recreation

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface absorbs rainfall readily but remains firm and is not dusty when dry. Strong slopes can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, and are not subject to flooding during the period of use.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is firm after rains and is not dusty when dry.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

J. P. Edwards, biologist, Soil Conservation Service, helped with this section.

Sampson County has excellent fish and wildlife habitat, especially for small game species, such as rabbit, squirrel, quail, and dove. Conditions of deer habitat are fair, and populations are moderate.

The soils of the county are generally excellent for managing most wildlife species. Aycock, Exum, Faceville, Goldsboro, Norfolk, Orangeburg, and Chipley soils have the greatest potential for supporting habitat for small game and big game.

Areas suitable for waterfowl habitat are primarily confined to the Bibb, Grantham, Johnston, and Roanoke soils. The soils that have the highest potential for supporting wetland wildlife habitat are rated as "good" or "fair" in table 10.

General land use patterns in the county are especially favorable to small game species. Of the approximately 379,782 acres in farmland in the county, about 35 percent, or 133,517 acres, is made up of farms of 100 to 259 acres. On these farms, openland and woodland are well interspersed, thus creating an abundance of very favorable edge habitat for most wildlife populations.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, barley, millet, buckwheat, soybeans, cowpeas, and sunflowers.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, switchgrass, clover, bahiagrass, trefoil, and crownvetch.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are goldenrod, beggarweed, patridgepea, and pokeweed.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, the available water capacity, and wetness. Examples of these plants are oak, poplar, sweetgum, dogwood, hickory, blackberry, blueberry, sweetbay, redbay, and titi. An example of a fruit-producing shrub that is suitable for planting on soils rated *good* is crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine and cedar.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, and slope. Examples of wetland plants are smartweed, wild millet, wildrice, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are wetness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include some woodpeckers, squirrels, and gray fox.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, Canadian geese (fig. 9), herons, muskrat, raccoon, and redwing blackbird.

Engineering

John F. Rice, civil engineer, Soil Conservation Service, helped prepare this section.

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

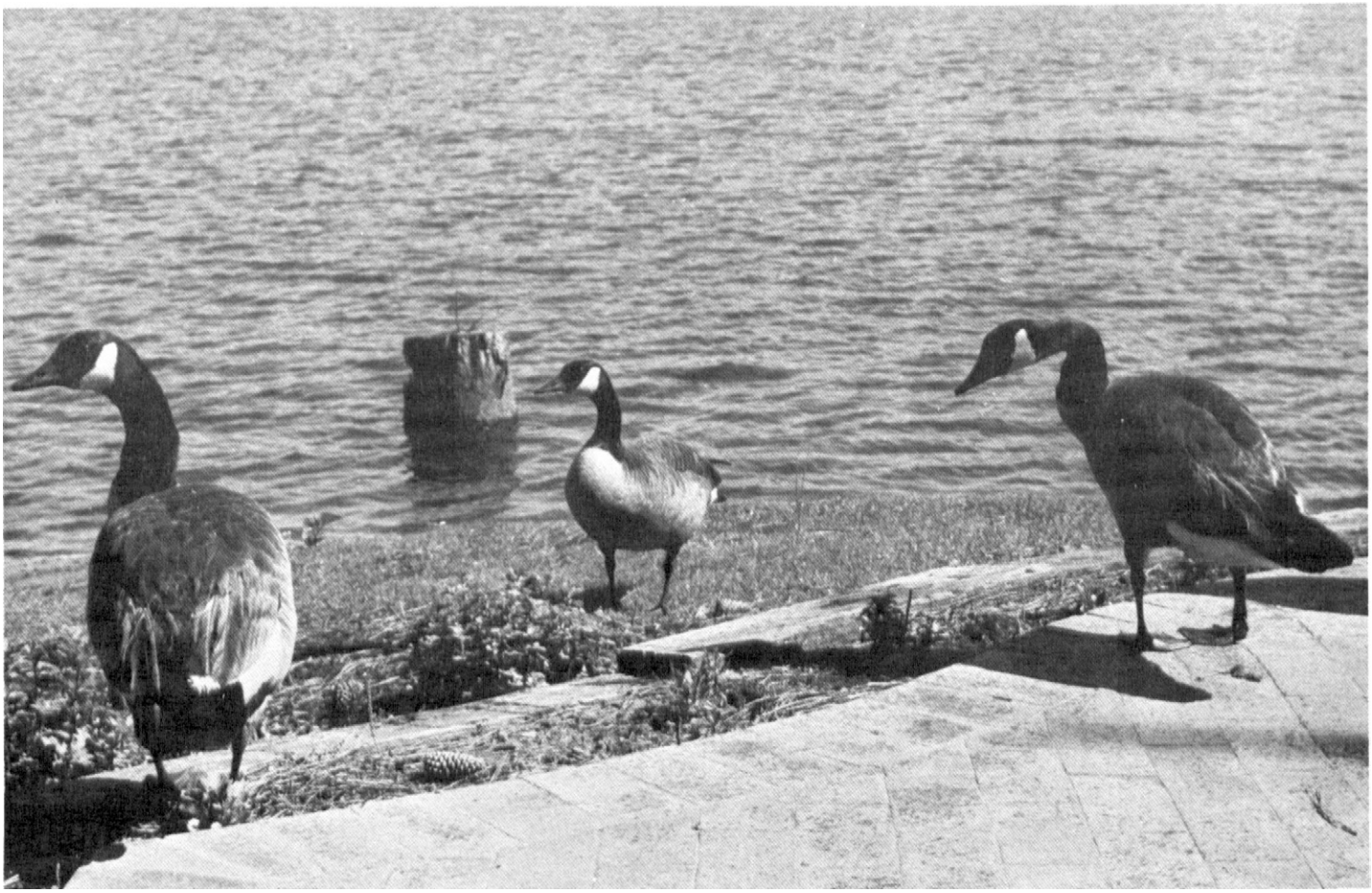


Figure 9.—Canadian geese, the largest of our North American waterfowl, are common winter residents of Sampson County. Here, a small flock begins its afternoon feeding.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and waste lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by soil texture and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to a high water table, flooding, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, and depth to a high water table affect the traffic supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, and the available water capacity in the upper 40 inches affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 12 shows the degree and the kind of soil limitations that affect septic tank absorption fields, waste lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, and flooding affect absorption of the effluent. A cemented pan interferes with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil

material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Waste lagoons are ponds constructed to hold waste material while anaerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Waste lagoons (fig. 10) generally are designed to hold waste within a depth of 6 to 12 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, flooding, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of waste material in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. Slope can cause construction problems.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Figure 10.—This waste lagoon is used to store animal waste material until proper disposal practices are implemented. This lagoon was constructed in Wagram loamy sand, 0 to 6 percent slopes.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, slope, and flooding affect both types of landfill. Texture, highly organic layers, and soil reaction affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 13 gives information about the soils as a source of roadfill, sand, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by a high water table and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand, and they have at least 5 feet of suitable material. The shrink-swell potential is low. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10 and a high shrink-swell potential. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand is a natural aggregate suitable for commercial use with a minimum of processing. Sand is used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand are gradation of grain sizes (as indicated by the engineering classification of the soil) and the thickness of suitable material. Acidity and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or a layer of sand that is up to 12 percent silty fines. This material must be at least 3 feet thick. All other soils are rated as an improbable source.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They have slopes of less than 8 percent, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, or soils that have slopes of 6 to 12 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for embankments, dikes, and levees and aquifer-fed ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of organic matter. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to stratified layers that affect the rate of water movement, permeability, depth to a high water table or depth of standing water if the soil is subject to ponding, slope, susceptibility to flooding, and subsidence of organic layers. Excavating and grading and the stability of ditchbanks are affected by slope and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The performance of a system is affected by the depth of the root zone and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope and wetness affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of erosion by wind or water, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Wetness and slope affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 18.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 18.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity,

infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

In table 17, some of the soils that have a high water table are shown with dual hydrologic groups, for example B/D. This means that under natural undrained conditions the soils fit in hydrologic group D; however, with artificial drainage, the water table can be lowered to such a depth that the soils fit in hydrologic group B. Onsite investigation is needed to determine the hydrologic group of the soil in a particular location.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions: *occasional* that it occurs, on the average, no more than once in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table—that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 17.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An *artesian* water table is under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil.

Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Engineering Index Test Data

Table 18 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." The soil samples were tested by North Carolina Department of Transportation and Highway Safety, Materials and Tests Unit.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are: AASHTO classification—M 145-73 (AASHTO), Mechanical analysis—T 88 (AASHTO), Liquid limit—T 89 (AASHTO), Plasticity index—T 90 (AASHTO), Moisture density, Method A—T 99 (AASHTO).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*8*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 19 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. They are differentiated on the basis of dominant soil-forming processes and degree of soil formation. Each order is identified by a word ending in *sol*. An example is Ultisol (a highly weathered mineral soil that has a subsoil of illuvial clay accumulation and is low in base saturation.)

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth. The last syllable in the name of a suborder indicates the order. An example is Aquult (*Aqu*, meaning water, plus *ult*, from Ultisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates properties of the soil. An example is Paleaquults (*Pale*, meaning development that is greater than normal, plus *aquult*, the suborder of the Ultisols that have an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not characteristic of the great group and are not transitions to any other known kind of soil. For example, an extragrade may be shallower to bedrock than other soils in the great group. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. Examples of subgroups are Typic Paleaquults and Aeric Paleaquults. Table 20 lists and explains the adjectives and formative elements used in naming the subgroups.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-silty, siliceous, thermic Typic Paleaquults.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual (*5*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*8*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Autryville Series

The Autryville series consists of well drained soils on uplands. These soils formed in sandy and loamy marine deposits. Slopes range from 0 to 6 percent.

Typical pedon of Autryville loamy sand, 0 to 6 percent slopes, in a cultivated field approximately 5 miles northwest of Piney Green; 0.4 mile southwest on State Road 1466 from the intersection of State Road 1466 and State Road 1456, 50 feet west of State Road 1466:

Ap—0 to 9 inches; grayish brown (10YR 5/2) loamy sand; very weak medium granular structure; very friable; many fine roots; medium acid; abrupt smooth boundary.
E—9 to 23 inches; pale brown (10YR 6/3) loamy sand; weak medium granular structure; very friable; few fine roots; 50 percent of sand grains have thin coatings of silt and clay; strongly acid; clear smooth boundary.
Bt1—23 to 26 inches; brownish yellow (10YR 6/8) loamy sand; weak medium granular structure; very friable; few fine roots; few thin clay coatings and bridgings of sand grains; strongly acid; clear smooth boundary.
Bt2—26 to 41 inches; yellowish brown (10YR 5/8) sandy loam; weak fine subangular blocky structure; very friable, slightly sticky; few fine roots; few thin clay films on faces of peds; strongly acid; clear wavy boundary.
Bt3—41 to 46 inches; brownish yellow (10YR 6/6) loamy sand; weak medium granular structure; very friable; few thin clay coatings and bridgings of sand grains; very strongly acid; clear irregular boundary.
E'—46 to 58 inches; very pale brown (10YR 7/4) sand; single grained; loose; 50 percent of sand grains have thin coatings of silt and clay; very strongly acid; clear wavy boundary.
Bt'—58 to 85 inches; brownish yellow (10YR 6/8) sandy clay loam with pockets of sandy loam; common medium distinct light gray (10YR 7/1) and yellowish red (5YR 5/8) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; many thick clay films on faces of peds; very strongly acid.

Autryville soils are more than 60 inches thick. Reaction is very strongly acid or strongly acid throughout unless the soil is limed.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 to 3.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 4. It is sand or loamy sand.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. It is sandy loam, sandy clay loam, or loamy sand.

The E' horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 4. It is loamy sand or sand.

The Bt' horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 2 to 8, with mottles in shades of gray, yellow, and red. It is sandy loam or sandy clay loam.

Aycock Series

The Aycock series consists of well drained soils on uplands. These soils formed in loamy sediments. Slopes range from 1 to 4 percent.

Typical pedon of Aycock silt loam, 1 to 4 percent slopes, in a cultivated field about 4 miles northwest of Roseboro; 0.1 mile northeast on State Road 1002 from the intersection of State Road 1002 and State Road 1485, 100 feet east of State Road 1002:

Ap—0 to 8 inches; grayish brown (10YR 5/2) silt loam; weak medium granular structure; very friable; many fine roots; medium acid; abrupt smooth boundary.
E—8 to 11 inches; pale brown (10YR 6/3) very fine sandy loam; weak medium granular structure; very friable; many fine roots; few pores filled with grayish brown material; medium acid; clear wavy boundary.
BE—11 to 13 inches; light yellowish brown (10YR 6/4) loam; weak fine subangular blocky structure; friable; few fine roots; few pores filled with grayish brown material; few thin clay coatings and bridgings of sand grains; strongly acid; clear wavy boundary.
Bt1—13 to 32 inches; yellowish brown (10YR 5/8) clay loam; weak fine angular blocky structure; friable, sticky, slightly plastic; few fine roots; few thin clay films on faces of peds; strongly acid; gradual wavy boundary.
Bt2—32 to 52 inches; brownish yellow (10YR 6/6) clay loam; common medium distinct yellowish red (5YR 4/8) mottles; weak fine angular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few thin clay films on faces of peds; very strongly acid; gradual wavy boundary.
Bt3—52 to 75 inches; brownish yellow (10YR 6/8) clay loam; common medium distinct light gray (10YR 7/1) and strong brown (7.5YR 5/8) mottles; weak fine angular blocky structure; friable, slightly sticky, slightly plastic; few thin clay films on faces of peds; very strongly acid; gradual wavy boundary.
C—75 to 85 inches; mottled light gray (10YR 7/1), strong brown (7.5YR 5/8), and red (2.5YR 4/8) clay loam; massive; friable; very strongly acid.

Aycock soils have loamy horizons more than 60 inches thick. Reaction is very strongly acid or strongly acid unless the soil is limed.

The Ap or A horizon has hue of 10YR, value of 4 or 6, and chroma of 2 to 4.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. It is loam, very fine sandy loam, or silt loam.

The BE horizon has hue of 10YR, value of 5 or 6, and chroma of 4 or 6. It is loam. The Bt horizon has hue of 10YR, value of 5 to 7, and chroma of 4 to 8; or it has hue of 7.5YR, value of 5, and chroma of 6 or 8. The Bt horizon is clay loam, silty clay loam, or silt loam. The sand fraction is dominantly very fine. The BC horizon, if present, has hue of 10YR, value of 5 or 6, and chroma of 6 or 8 and is mottled in shades of gray to red.

The C horizon is mottled with shades of gray, yellow, and red. It is clay loam or clay.

Bibb Series

The Bibb series consists of poorly drained soils on flood plains. The soils formed in loamy and sandy fluvial sediments. Slopes range from 0 to 2 percent.

Typical pedon of Bibb loamy sand in an area of Bibb and Johnston soils, frequently flooded, in a wooded first bottom; about 0.9 mile southwest of Hargrove Crossroads, 100 feet southeast of N.C. Highway 403 bridge over Six Runs Creek:

A1—0 to 6 inches; dark grayish brown (10YR 4/2) loamy sand; weak medium granular structure; very friable; many fine roots; very strongly acid; gradual wavy boundary.

Cg1—6 to 15 inches; grayish brown (10YR 5/2) sandy loam; common medium faint gray (10YR 6/1) mottles; weak medium granular structure; very friable; common strata of loamy sand; many fine roots; strongly acid; gradual wavy boundary.

Cg2—15 to 34 inches; grayish brown (10YR 5/2) sandy loam; massive; very friable, slightly sticky; common strata of loamy sand; many fine roots; strongly acid; gradual wavy boundary.

Cg3—34 to 60 inches; gray (10YR 6/1) sandy loam; common coarse faint grayish brown (10YR 5/2) mottles; massive; very friable, slightly sticky; strongly acid; gradual wavy boundary.

Cg4—60 to 80 inches; light brownish gray (10YR 6/2) loamy sand; single grained; loose; common strata of sand; strongly acid.

The Bibb soil is very strongly acid or strongly acid. A few flakes of mica are in some pedons.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2.

The Cg horizon has hue of 10YR, value of 3 to 7, and chroma of 1 or 2. It has few to common mottles in shades of gray, yellow, brown, and red. The 10- to 40-inch control section is sandy loam, loamy sand, loam, or sand or is stratified. It averages less than 18 percent clay. In some pedons, the C horizon has thin strata with a high content of gravel.

Blanton Series

The Blanton series consists of moderately well drained soils on uplands. These soils formed in sandy and loamy marine or eolian deposits. Slopes range from 0 to 6 percent.

Typical pedon of Blanton sand, 0 to 6 percent slopes, in a cultivated field 2.5 miles west of Concord; 0.6 mile northeast on State Road 1302 from the intersection of State Roads 1301 and 1302, and 0.3 mile southeast of State Road 1302:

Ap—0 to 8 inches; grayish brown (10YR 5/2) sand; single grained; loose; many fine roots; strongly acid; abrupt smooth boundary.

E—8 to 48 inches; very pale brown (10YR 7/4) sand; single grained; loose; few fine roots in upper part; a 1/4-inch lamella of loamy sand in the lower part and few coarse light gray mottles of uncoated sand; strongly acid; clear wavy boundary.

Bt1—48 to 58 inches; light yellowish brown (10YR 6/4) sandy loam; common medium distinct pale brown (10YR 6/3) mottles; weak fine subangular blocky structure; very friable, slightly sticky, slightly plastic; few thin clay films on faces of peds and in pores; strongly acid; clear wavy boundary.

Bt2—58 to 68 inches; yellowish brown (10YR 5/8) sandy clay loam and pockets of sandy loam; many coarse distinct light gray (10YR 6/1) mottles and few medium distinct red (2.5YR 4/6) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common thin clay films on faces of peds and in pores; very strongly acid; gradual wavy boundary.

Bt3—68 to 85 inches; light yellowish brown (10YR 6/4) sandy clay loam; common medium distinct light gray (10YR 7/1) and yellowish red (5YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few pockets of sandy loam; common thin clay films on faces of peds and in pores; very strongly acid.

Blanton soils are sandy and loamy to a depth of 60 to 80 inches. Reaction is very strongly acid or strongly acid unless the soil is limed.

The Ap or A horizon has hue of 10YR, value of 5 or 6, and chroma of 2 or 3.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 2 to 8. In some pedons, this horizon has fine and medium pockets of uncoated sand grains. The texture is sand, fine sand, or loamy sand.

The BE horizon, if present, has hue of 10YR, value of 6, and chroma of 4. The texture is sandy loam. The Bt horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 8. Mottles in shades of gray and red are few to common below the upper 10 inches of the Bt horizon. Texture is sandy clay loam or sandy loam.

Cainhoy Series

The Cainhoy series consists of somewhat excessively drained soils on uplands. These soils formed in sandy sediments. Cainhoy soils have slopes that range from 0 to 5 percent.

Typical pedon of Cainhoy sand, 0 to 5 percent slopes, in a woodland area 0.4 mile southwest of Kerr; 0.3 mile northeast on State Road 1007 from the intersection of State Roads 1007 and 1122, 25 feet north of State Road 1007:

A—0 to 3 inches; gray (10YR 5/1) sand; single grained; loose; common small particles of organic matter; about one-half of grains have thin coating of organic matter; few fine roots; very strongly acid; clear wavy boundary.
Bw1—3 to 22 inches; yellow (10YR 7/6) sand; single grained; loose; thin coating on sand grains; very strongly acid; gradual wavy boundary.
Bw2—22 to 42 inches; strong brown (7.5YR 5/6) sand; single grained; loose; thin coating on sand grains; very strongly acid; gradual wavy boundary.
Bw3—42 to 66 inches; yellow (10YR 7/6) sand; single grained; loose; very thin coating on about one-half of sand grains; strongly acid; gradual wavy boundary.
E—66 to 90 inches; light gray (10YR 7/2) sand; single grained; loose; uncoated grains; medium acid; clear smooth boundary.
Bh/E—90 to 99 inches; dark reddish brown (5YR 3/2) sand; single grained; loose alternating layers of light gray uncoated sand grains about one-half inch thick and humus coated sand grains about 2 inches thick; strongly acid.

Cainhoy soils are sandy to a depth of more than 80 inches. Reaction ranges from very strongly acid to slightly acid.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3.

The Bw horizon has hue of 7.5YR or 10YR, value of 5 to 8, and chroma of 3 to 8. It is sand or fine sand.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. Texture is sand or fine sand.

The Bh/E horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 or 2. Texture is sand or fine sand.

Chipley Series

The Chipley series consists of moderately well drained soils on stream terraces. These soils formed in sandy marine sediments. Slopes range from 0 to 2 percent.

Typical pedon of Chipley sand, in a wooded area 0.4 mile southwest of Clear Run; 300 feet east of Center Church, 25 feet south of N.C. Highway 411:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) sand; single grained; loose; many fine roots; strongly acid; abrupt smooth boundary.
Bw—6 to 26 inches; yellowish brown (10YR 5/4) sand; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.
C1—26 to 36 inches; pale brown (10YR 6/3) sand; few medium distinct light gray (10YR 7/1) and yellowish brown (10YR 5/8) mottles; single grained; loose; very strongly acid; abrupt wavy boundary.
C2—36 to 44 inches; light brownish gray (10YR 6/2) sand; common coarse distinct strong brown (7.5YR 5/8) and yellowish brown (10YR 5/8) mottles; single grained; loose; strongly acid; gradual wavy boundary.
C3—44 to 80 inches; light gray (10YR 7/1) sand; common medium distinct yellowish brown (10YR 5/8) mottles; single grained; loose; common fine pebbles; strongly acid.

Chipley soils are sandy to a depth of 80 inches or more. The silt and clay content between depths of 10 and 40 inches is 5 to 10 percent. Reaction is very strongly acid or strongly acid.

The Ap or A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2.

The Bw horizon has hue of 10YR, value of 5 to 7, and chroma of 4 to 8. In places there is no Bw horizon.

The C horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 8. Few to common mottles ranging from gray to strong brown occur in the lower part of most profiles.

Coxville Series

The Coxville series consists of poorly drained soils on uplands. The soils formed in clayey marine sediments. Slopes are less than 2 percent.

Typical pedon of Coxville loam in a cultivated field 0.8 mile southeast of Newton Grove; 0.4 mile southeast on State Road 1703 from the intersection of U.S. Highway 13 and State Road 1703, 20 feet southeast of State Road 1703:

Ap—0 to 10 inches; dark gray (10YR 4/1) loam; weak medium granular structure; friable; many fine roots; very strongly acid; abrupt smooth boundary.
Btg1—10 to 13 inches; gray (10YR 5/1) clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; weak fine angular blocky structure; firm; few fine roots; common fine and large cracks and root channels filled with dark gray loam; few thin clay films on faces of peds; very strongly acid; clear irregular boundary.
Btg2—13 to 35 inches; gray (10YR 5/1) sandy clay; common fine distinct yellowish brown (10YR 5/8) mottles; moderate fine angular blocky structure; firm, sticky, plastic; few pores filled with dark gray loam; few thin clay films on faces of peds; very strongly acid; gradual wavy boundary.
Btg3—35 to 55 inches; gray (10YR 6/1) sandy clay; common fine distinct yellowish red (5YR 5/8) mottles; weak fine angular blocky structure; firm, sticky, plastic; few thin clay films on faces of peds; very strongly acid; gradual wavy boundary.
Btg4—55 to 64 inches; gray (10YR 6/1) sandy clay; weak fine subangular blocky structure; firm, sticky, plastic; few thin clay films on ped faces; very strongly acid; gradual wavy boundary.

Cg—64 to 85 inches; gray (10YR 6/1) sandy loam; common fine distinct light gray (2.5Y 7/2) and few medium distinct strong brown (7.5YR 5/8) mottles; massive; friable, slightly sticky, slightly plastic; very strongly acid.

Coxville soils are clayey and loamy to a depth of more than 60 inches. The soils are very strongly acid or strongly acid unless limed.

The Ap or A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2.

The E horizon, if present, has hue of 10YR, value of 6, and chroma of 2. It is fine sandy loam.

The BE horizon, if present, has hue of 10YR, value of 5, and chroma of 1. The texture is clay loam or sandy clay loam.

The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It has few to common mottles in shades of brown, yellow, and red. The texture is sandy clay or clay loam.

The BCg horizon, if present, has hue of 10YR, value of 6, and chroma of 1. The texture is sandy clay with few to common pockets of sandy loam or sandy clay loam.

The Cg horizon has hue of 10YR, value of 6, and chroma of 1, or the matrix is mottled with shades of gray, brown, yellow, and red. The texture ranges from sand to clay.

Exum Series

The Exum series consists of moderately well drained soils on uplands. These soils formed in loamy Coastal Plain sediments. Slopes range from 0 to 2 percent.

Typical pedon of Exum silt loam, 0 to 2 percent slopes, in a cultivated field 1.5 miles northwest of Roseboro; 0.1 mile west on State Road 1402 from the intersection of State Road 1401 and State Road 1402, 300 feet west of State Road 1402:

Ap—0 to 7 inches; grayish brown (10YR 5/2) silt loam; weak medium granular structure; very friable; many fine roots; medium acid; abrupt smooth boundary.

E—7 to 11 inches; pale brown (10YR 6/3) very fine sandy loam; weak medium granular structure; very friable; many fine roots; medium acid; clear wavy boundary.

BE—11 to 13 inches; brownish yellow (10YR 6/6) loam; weak fine subangular blocky structure; friable; common fine roots; strongly acid; clear wavy boundary.

Bt1—13 to 23 inches; yellowish brown (10YR 5/6) clay loam; weak fine angular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few thin discontinuous clay films on faces of peds and in pores; very strongly acid; gradual wavy boundary.

Bt2—23 to 48 inches; brownish yellow (10YR 6/6) clay loam; common fine and medium distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/8) mottles; weak fine angular blocky structure; friable, slightly sticky, slightly plastic; few fine prominent red (2.5YR 5/8) brittle iron concretions less than 1 percent by volume; few thin discontinuous clay films on faces of peds and in pores; very strongly acid; gradual wavy boundary.

Bt3—48 to 68 inches; mottled light gray (10YR 7/1), brownish yellow (10YR 6/8), and red (2.5YR 4/8) clay loam; weak fine angular blocky structure; friable, slightly sticky, slightly plastic; common thin clay films on faces of peds; very strongly acid; gradual wavy boundary.

Cg—68 to 85 inches; gray (10YR 6/1) clay loam; common medium distinct red (2.5YR 4/8) and yellowish brown (10YR 5/6) mottles; massive; friable, slightly sticky, slightly plastic; very strongly acid.

Exum soils have loamy horizons more than 60 inches thick. The soils are very strongly acid or strongly acid unless limed.

The Ap or A horizon has hue of 10YR, value of 4 to 6, and chroma of 2 or 3.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. It is very fine sandy loam or loam. In some places there is no E horizon.

The BE horizon has hue of 10YR, value of 6, and chroma of 6. The texture is very fine sandy loam or loam. In some places there is no BE horizon.

The upper part of the Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 8. Gray mottles are within 30 inches of the surface. The lower part of the Bt horizon is dominantly gray or is mottled in shades of gray, brown, or red. The Bt horizon is dominantly clay loam, silty clay loam, or loam. The sand fraction is dominantly very fine.

The BC horizon, if present, has hue of 10YR, value of 6, and chroma of 1, or value of 6 and chroma of 8, with common to many gray and red mottles. The texture is clay loam, silty clay loam, or clay.

The Cg horizon of some pedons has hue of 10YR, value of 6, and chroma of 1. It has common mottles in shades of brown. The texture is clay loam or clay.

Faceville Series

The Faceville series consists of well drained soils on uplands. These soils formed in clayey sediments. Slopes range from 0 to 6 percent.

Typical pedon of Faceville fine sandy loam, 0 to 2 percent slopes, in a cultivated field 5 miles northwest of Clinton; 1.7 miles southwest of Kitty Fork, 0.3 mile northeast on State Road 1320 from the intersection of State Roads 1320 and 1319, 25 feet southeast of State Road 1320:

Ap—0 to 8 inches; brown (10YR 5/3) fine sandy loam; weak medium granular structure; very friable; many fine roots; medium acid; abrupt smooth boundary.
E—8 to 14 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak medium granular structure; very friable; many fine roots; medium acid; clear irregular boundary.
Bt1—14 to 63 inches; yellowish red (5YR 4/8) clay; weak medium subangular blocky structure; firm, sticky, plastic; few fine roots in upper 20 inches; common thin clay films on faces of peds and in pores; strongly acid; gradual wavy boundary.
Bt2—63 to 90 inches; yellowish red (5YR 4/8) sandy clay; common medium faint reddish yellow (7.5YR 6/8) mottles; weak fine angular blocky structure; firm, sticky, plastic; many thick clay films on faces of peds and in pores; very strongly acid; gradual wavy boundary.
Bt3—90 to 99 inches; mottled strong brown (7.5YR 5/8), yellowish brown (10YR 5/8), and red (2.5YR 4/8) sandy clay loam; weak fine angular blocky structure; friable, slightly sticky; common thick clay films on faces of peds; strongly acid.

Faceville soils have loamy and clayey horizons more than 60 inches thick. The reaction is very strongly acid or strongly acid, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3; or it has hue of 7.5YR, value of 5, and chroma of 8.

The E horizon has hue of 10YR, value of 6, and chroma of 3 or 4. The texture is fine sandy loam or loamy sand. In some places the E horizon does not occur.

The BE horizon, if present, has hue of 5YR, value of 5, and chroma of 8. The texture is sandy clay loam.

The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 4 to 8; or it is mottled in the lower part. The texture is sandy clay, clay, or clay loam or thin layers of sandy clay loam. The clay content of the upper 20 inches is greater than 35 percent. The silt content is less than 30 percent.

The BC horizon, if present, is mottled in shades of brown, yellow, and red. The texture is sandy clay loam.

The C horizon, if present, is mottled in shades of gray, brown, and red. The texture is sandy clay loam.

Foreston Series

The Foreston series consists of moderately well drained soils on uplands. These soils formed in loamy marine sediments. Slopes range from 0 to 2 percent.

Typical pedon of Foreston loamy sand in a woods 2.1 miles southwest of Giddensville; 0.3 mile southwest on State Road 1734 from the intersection of N.C. Highway 403 and State Road 1734, 25 feet south of State Road 1734, in powerline right-of-way:

A—0 to 2 inches; very dark gray (10YR 3/1) loamy sand; weak medium granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.
E—2 to 6 inches; brown (10YR 5/3) loamy sand; weak medium granular structure; very friable; many fine roots; very strongly acid; clear wavy boundary.
Bt1—6 to 12 inches; light yellowish brown (10YR 6/4) sandy loam; common medium faint brownish yellow (10YR 6/6) mottles; weak medium granular structure; very friable; sand grains coated and bridged with clay; many fine roots; very strongly acid; clear wavy boundary.
Bt2—12 to 23 inches; light yellowish brown (10YR 6/4) sandy loam; few fine faint light brownish gray and common fine distinct strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; friable; sand grains coated and bridged with clay; many fine roots; common pores; very strongly acid; gradual wavy boundary.
Btg1—23 to 48 inches; gray (10YR 6/1) loamy sand with pockets of sandy loam; few distinct brownish yellow (10YR 6/6) and yellowish red (5YR 5/8) mottles; weak medium granular structure; very friable; thin clay coatings on sand grains; common fine roots; very strongly acid; gradual wavy boundary.
Btg2—48 to 67 inches; light brownish gray (10YR 6/2) loamy sand with pockets of sand; common medium distinct brownish yellow (10YR 6/6) and common medium faint light gray (10YR 7/1) mottles; weak medium granular structure; very friable; thin clay coatings on sand grains; very strongly acid; gradual wavy boundary.
Cg—67 to 85 inches; pinkish gray (7.5YR 6/2) uncoated sand and pockets of gray (10YR 6/1) and brownish yellow (10YR 6/6), faintly coated loamy sand and sandy clay loam; single grained; loose; very strongly acid.

Foreston soils have sandy and loamy horizons more than 60 inches thick. The soil is very strongly acid or strongly acid.

The Ap or A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. It is loamy sand, loamy fine sand, or sand. In some places there is no E horizon.

The BE horizon, if present, has hue of 10YR, value of 6, and chroma of 4. The texture is loamy sand or sandy loam.

The upper part of the Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 6. The lower part of the Bt horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2 and in some pedons is mottled in shades of gray, brown, or yellow. The texture of the Bt horizon is sandy loam, fine sandy loam, or loamy sand.

The BC horizon, if present, has hue of 10YR, value of 6 or 7, and chroma of 1 to 3, with mottles in shades of gray, yellow, and brown. It is loamy sand, sandy loam, or sand.

The C horizon has hue of 10YR or 7.5YR, value of 6 to 8, and chroma of 1 or 2. The texture, which is variable, ranges from sand to sandy clay loam.

Goldsboro Series

The Goldsboro series consists of moderately well drained soils on uplands. These soils formed in loamy marine sediments. Slopes range from 0 to 2 percent.

Typical pedon of Goldsboro loamy sand, 0 to 2 percent slopes, in a cultivated field 0.9 mile northwest of Newton Grove; 0.7 mile west on N.C. Highway 50-55 from the intersection of N.C. Highway 50-55 and N.C. Highway 50, 150 feet north of N.C. Highway 50-55:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loamy sand; weak medium granular structure; very friable; many fine roots; medium acid; abrupt smooth boundary.

E—8 to 10 inches; pale brown (10YR 6/3) loamy sand; weak medium granular structure; very friable; many fine roots; medium acid; clear smooth boundary.

Bt1—10 to 21 inches; yellowish brown (10YR 5/6) sandy clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common fine roots; few clean sand grains in pores; very strongly acid; gradual smooth boundary.

Bt2—21 to 46 inches; pale brown (10YR 6/3) sandy clay loam; common medium distinct light gray (10YR 7/2) and yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few thin clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt3—46 to 96 inches; mottled yellowish brown (10YR 5/6), light gray (2.5Y 7/2), brownish yellow (10YR 6/6), and light yellowish brown (10YR 6/4) sandy clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; thin discontinuous clay films on faces of peds and in pores; very strongly acid; gradual irregular boundary.

C—96 to 99 inches; mottled light gray (10YR 7/2), light yellowish brown (10YR 5/8), and red (7.5YR 4/8) sandy loam; massive; friable, slightly sticky, slightly plastic; very strongly acid.

Goldsboro soils have loamy and sandy horizons more than 60 inches thick. The soils are very strongly acid or strongly acid unless limed.

The Ap or A horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2.

The E horizon has hue of 10YR, value of 6, and chroma of 3. It is loamy sand or loamy fine sand. In some places there is no E horizon.

The BE horizon, if present, has hue of 10YR, value of 5 or 6, and chroma of 4 or 6. The texture is sandy loam or sandy clay loam.

The upper part of the Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 8. Gray mottles are within 30 inches of the surface. The lower part of the Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 1 to 3, or it is mottled in shades of brown, gray, or yellow. The Bt horizon is sandy clay loam.

The BC horizon, if present, has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. The BC horizon may be mottled in shades of gray, brown, or yellow. The texture is sandy clay loam.

The C horizon has hue of 10YR, value of 5 to 7, and chroma of 2 to 8. It is commonly mottled in shades of gray, brown, or yellow. It is sandy, loamy, or clayey Coastal Plain sediments.

Grantham Series

The Grantham series consists of poorly drained soils on uplands. These soils formed in loamy and silty Coastal Plain sediments. Slopes range from 0 to 2 percent.

Typical pedon of Grantham loam in a woods 0.9 mile west of Halls Crossroads; 200 feet south of State Road 1414:

A—0 to 3 inches; black (10YR 2/1) loam; weak medium granular structure; very friable; many roots; very strongly acid; clear wavy boundary.

E1—3 to 6 inches; grayish brown (10YR 5/2) loam; weak medium granular structure; very friable; many fine roots; very strongly acid; clear wavy boundary.

E2—6 to 9 inches; light brownish gray (10YR 6/2) loam; common medium distinct light yellowish brown (10YR 6/4) mottles; weak medium granular structure; friable, slightly sticky, slightly plastic; common fine roots; very strongly acid; clear wavy boundary.

Btg1—9 to 23 inches; gray (10YR 6/1) clay loam; few medium distinct brownish yellow (10YR 6/6) mottles; weak fine angular blocky structure; friable, slightly sticky, slightly plastic; common fine roots; few thin clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg2—23 to 34 inches; gray (10YR 6/1) clay loam; few medium distinct yellowish brown (10YR 5/8) and few medium prominent red (2.5YR 4/8) mottles; weak medium angular blocky structure; friable, slightly sticky, slightly plastic; few thin clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg3—34 to 54 inches; gray (10YR 6/1) clay loam; common medium distinct brownish yellow (10YR 6/8) mottles; weak medium angular blocky structure; friable, slightly sticky, slightly plastic; thin patchy clay

films on faces of peds and in pores; very strongly acid; gradual wavy boundary.
Btg4—54 to 85 inches; light gray (10YR 7/1) clay loam; many medium distinct brownish yellow (10YR 6/8) mottles; weak coarse subangular blocky structure; firm, sticky, plastic; common thick clay films on faces of peds; very strongly acid.

Grantham soils have loamy horizons more than 60 inches thick. The soil ranges from extremely acid to strongly acid unless limed.

The A or Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. If the A or Ap horizon has value of 3 or less, it is less than 10 inches thick.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It is loam, very fine sandy loam, or silt loam. In some places there is no E horizon.

The BE horizon, if present, has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Some pedons have few to common mottles in shades of brown or yellow. The texture is loam or silt loam.

The Btg horizon has hue of 10YR, value of 6 or 7, and chroma of 1. It has few to many mottles in shades of yellow, brown, or red. The texture is clay loam or loam.

The BCg horizon, if present, is similar in color and texture to the B2tg.

The Cg horizon, if present, is similar in color to the B3g horizon. The texture is clay loam or clay.

Gritney Series

The Gritney series consists of well drained or moderately well drained soils on uplands. These soils formed in clayey marine sediments. Slopes range from 4 to 8 percent.

Typical pedon of Gritney fine sandy loam, 4 to 8 percent slopes, in a woods 2 miles west of Ingold; 0.6 mile northwest on State Road 1206 from the intersection of State Roads 1206 and 1207, 25 feet east of State Road 1206:

A—0 to 4 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak medium granular structure; very friable; many fine roots; very strongly acid; clear wavy boundary.
E—4 to 12 inches; pale brown (10YR 6/3) fine sandy loam; weak medium granular structure; very friable; many fine roots; very strongly acid; clear wavy boundary.
Bt1—12 to 15 inches; yellowish brown (10YR 5/6) sandy clay loam; moderate fine subangular blocky structure; friable; common fine roots; few thin clay films on faces of peds; very strongly acid; clear wavy boundary.
Bt2—15 to 30 inches; yellowish brown (10YR 5/6) clay; few fine distinct red (2.5YR 4/8) and light brownish gray (10YR 6/2) mottles; strong fine angular blocky structure; very firm, very sticky, very plastic; few thin clay films on faces of peds; very strongly acid; gradual wavy boundary.
Btg—30 to 58 inches; gray (10YR 6/1) clay; common fine distinct yellowish red (5YR 5/8) and brownish yellow (10YR 6/8) mottles; strong fine angular blocky structure; very firm, very sticky, very plastic; common thick clay films on faces of peds and in pores; very strongly acid; gradual wavy boundary.
C—58 to 85 inches; mottled gray (10YR 6/1), brownish yellow (10YR 6/8), and red (2.5YR 4/8) clay loam; massive; firm, sticky, plastic; very strongly acid.

Gritney soils are clayey and loamy to a depth of 40 to 60 inches. The soils are very strongly acid or strongly acid.

The A or Ap horizon has hue of 10YR, value of 4 to 6, and chroma of 1 to 4.

The E horizon has hue of 10YR, value of 6, and chroma of 3 or 4. The texture is fine sandy loam or loamy sand. In some places there is no E horizon.

The BE horizon, if present, has hue of 10YR, value of 5, and chroma of 6 or 8. The texture is sandy clay loam or sandy loam.

The upper part of the Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 4 to 8. The lower part of the Bt horizon and the BC horizon, if present, are gray or mottled in shades of gray, red, or brown; or they are dominantly gray with brown or red mottles. The texture is sandy clay, clay, or clay loam; but some pedons have thin layers of sandy clay loam.

The C horizon has gray color or is mottled in shades of gray, brown, yellow, or red. The texture is clay, sandy clay loam, or clay loam.

Johns Series

The Johns series consists of somewhat poorly drained to moderately well drained soils on stream terraces. These soils formed in loamy fluvial sediments. Slopes range from 0 to 2 percent.

Typical pedon of Johns fine sandy loam in a cultivated field 1.5 miles west of Ingold; 0.4 mile southwest of the intersection of State Road 1202 and State Road 1207, 0.3 mile south of 1207 on farm road, 10 feet northeast of farm road:

Ap—0 to 8 inches; dark gray (10YR 4/1) fine sandy loam; weak medium granular structure; very friable; many fine roots; strongly acid; abrupt wavy boundary.
E—8 to 12 inches; pale brown (10YR 6/3) sandy loam; weak medium granular structure; very friable; many fine roots; strongly acid; clear wavy boundary.
BE—12 to 15 inches; brown (10YR 5/3) sandy loam; weak fine subangular blocky structure; very friable; many fine roots; very strongly acid; clear wavy boundary.

Bt1—15 to 25 inches; yellowish brown (10YR 5/4) sandy clay loam; few fine distinct gray (10YR 5/1) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few thin clay films on faces of peds and in pores; very strongly acid; gradual wavy boundary.

Bt2—25 to 36 inches; grayish brown (10YR 5/2) sandy loam; few medium distinct light yellowish brown (10YR 6/4) and strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; very friable, slightly sticky, slightly plastic; few thin clay films on faces of peds and in pores; very strongly acid; abrupt irregular boundary.

2Cg—36 to 65 inches; light gray (10YR 7/1) sand; few medium distinct light yellowish brown (10YR 6/4) mottles; single grained; loose; strongly acid.

Johns soils have loamy horizons that are 20 to 40 inches thick. The soils are very strongly acid or strongly acid except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2.

The E horizon has hue of 10YR, value of 6 or 7, and chroma of 3. It is sandy loam or loamy sand. In places there is no E horizon.

The BE horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. The texture is sandy loam or fine sandy loam. In places the BE horizon does not occur.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 or 6. It is mottled in shades of gray and brown. The lower part of the Bt horizon may have chroma of 1 or 2, or it is mottled in shades of gray and brown. The texture is sandy clay loam or sandy loam.

The BC horizon, if present, has hue of 10YR, value of 5 to 7, and chroma of 1 to 6. Mottles in shades of gray, brown, or yellow are in most pedons. Texture is sandy clay loam or sandy loam.

The 2Cg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. It is commonly mottled in shades of gray, brown, or yellow. The texture is loamy sand or sand. Some pedons may have layers or strata of loamy or clayey material.

Johnston Series

The Johnston series consists of very poorly drained soils that formed in loamy fluvial and marine sediments. Slopes range from 0 to 2 percent.

Typical pedon of Johnston loam, approximately 4 miles southwest of Newton Grove; about 2.25 miles southwest of the junction of U.S. Highway 701 and State Road 1843, 1.4 miles southwest of the junction of State Road 1843 and State Road 1817, 1 mile west of the junction of State Road 1817 and State Road 1636, 100 yards south of State Road 1636, in woods:

A—0 to 30 inches; black (10YR 2/1) loam; weak medium granular structure; friable; very strongly acid; gradual wavy boundary.

Cg1—30 to 37 inches; dark grayish brown (10YR 4/2) sandy loam; common medium faint very dark grayish brown (10YR 3/2) and brown (10YR 5/3) mottles; massive; friable; very strongly acid; clear wavy boundary.

Cg2—37 to 47 inches; light brownish gray (10YR 6/2) loamy sand; common medium faint grayish brown (10YR 5/2) mottles; single grained; loose; very strongly acid; gradual wavy boundary.

Cg3—47 to 62 inches; dark grayish brown (10YR 4/2) loamy sand; common medium distinct light gray (10YR 7/1) mottles; single grained; loose; very strongly acid.

Johnston soils have a dark A horizon more than 24 inches thick. The soils are very strongly acid or strongly acid.

The A horizon has hue of 10YR or 2.5Y, or it is neutral. It has value of 2 or 3 and chroma of 0 to 2.

The Cg horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. The texture is loamy sand, sandy loam, or sand.

Kalmia Series

The Kalmia series consists of well drained soils on stream terraces. These soils formed in loamy fluvial sediments. Slopes range from 0 to 3 percent.

Typical pedon of Kalmia loamy sand, 0 to 3 percent slopes, in a cultivated field 1.5 miles west of Ingold; 0.2 mile southwest on State Road 1207 from the intersection of State Road 1206 and State Road 1207, 25 feet north of State Road 1207:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) loamy sand; weak medium granular structure; very friable; many fine roots; medium acid; abrupt smooth boundary.

BE—9 to 13 inches; dark yellowish brown (10YR 4/4) sandy loam; weak medium subangular blocky structure; friable; many fine roots; strongly acid; clear wavy boundary.

Bt1—13 to 28 inches; yellowish brown (10YR 5/4) sandy clay loam; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few thin clay films on faces of peds and in pores; very strongly acid; gradual wavy boundary.

Bt2—28 to 36 inches; yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure; very friable, slightly sticky, slightly plastic; sand grains have thin clay coatings; very strongly acid; clear irregular boundary.

2C—36 to 65 inches; light yellowish brown (10YR 6/4) sand; common coarse faint light gray (10YR 7/1)

and yellowish brown (10YR 5/8) mottles; single grained; loose; strongly acid.

Kalmia soils have a loamy B horizon that ranges from 20 to 40 inches in thickness. The soils are very strongly acid or strongly acid unless limed.

The Ap or A horizon has hue of 10YR, value of 4 to 6, and chroma of 1 to 4.

The E horizon, if present, has hue of 10YR, value of 5 to 7, and chroma of 2 or 4. The texture is loamy sand or loamy fine sand.

The BE horizon has hue of 10YR, value of 4 to 7, and chroma of 4. The texture is sandy loam, fine sandy loam, or loam. Some pedons have no BE horizon.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. The texture of the Bt2 horizon is sandy clay loam or sandy loam.

The BC horizon, if present, has hue of 10YR, value of 5 to 7, and chroma of 4 to 8. The texture is sandy loam or loamy sand.

The 2C horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 8. Mottles in shades of gray, brown, or yellow are few to common. The texture is sand or loamy sand.

Leon Series

The Leon series consists of poorly drained soils on uplands. These soils formed in sandy marine sediments. Slopes range from 0 to 2 percent.

Typical pedon of Leon sand, 0 to 2 percent slopes, in a woods 0.4 mile northeast of Kerr; 50 feet south of the intersection of State Road 1120 and State Road 1007:

A—0 to 3 inches; dark gray (10YR 4/1) sand; single grained; loose; many fine roots; most sand grains have a thin organic coating; extremely acid; clear wavy boundary.

E—3 to 22 inches; light gray (10YR 7/1) sand; single grained; loose; few fine roots; strongly acid; clear wavy boundary.

Bh1—22 to 26 inches; dark reddish brown (5YR 3/2) sand; massive; weakly cemented; friable; organic coatings on most sand grains; very strongly acid; gradual wavy boundary.

Bh2—26 to 46 inches; black (5YR 2/1) sand; massive; weakly cemented; friable; thick organic coating and bridging of sand grains; very strongly acid; gradual wavy boundary.

Cg—46 to 70 inches; light brownish gray (10YR 6/2) sand; single grained; loose; uncoated grains; strongly acid.

Leon soils are sand or fine sand to a depth of 70 inches or more. The soils range from extremely acid to strongly acid unless limed.

The Ap or A horizon has no hue or hue of 10YR, or it is neutral. It has value of 2 to 4 and chroma of 0 or 1.

The E horizon has hue of 10YR, value of 6 or 7, and chroma of 1.

The Bh horizon has hue of 10YR, 7.5YR, or 5YR, value of 2 or 3, and chroma of 1 or 2.

The E' horizon, if present, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2.

The B'h horizon, if present, has hue of 10YR, 7.5YR, or 5YR, value of 2 or 3, and chroma of 1 or 2.

The Cg horizon has hue of 10YR, value of 6, and chroma of 1 or 2.

Lumbee Series

The Lumbee series consists of poorly drained soils on stream terraces. These soils formed in loamy fluvial sediments. Slopes range from 0 to 2 percent.

Typical pedon of Lumbee sandy loam in a cultivated field 1.5 miles west of Ingold; 0.4 mile southwest of the intersection of State Road 1206 and State Road 1207, 50 feet north of State Road 1207 and old home site:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) sandy loam; weak medium granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

Btg1—8 to 28 inches; grayish brown (10YR 5/2) sandy clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few thin clay films on faces of peds and in pores; very strongly acid; gradual wavy boundary.

Btg2—28 to 39 inches; gray (10YR 6/1) sandy clay loam; pockets of sandy loam and loamy sand; common fine medium distinct yellowish brown (10YR 5/8) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few thin clay films on faces of peds and in pores; very strongly acid; gradual wavy boundary.

2Cg—39 to 65 inches; dark gray (10YR 4/1) loamy sand; pockets of strata of coarse sandy loam and coarse sand; single grained; very friable; very strongly acid.

Lumbee soils have loamy horizons that extend to a depth of 20 to 40 inches. The soils are very strongly acid or strongly acid unless limed.

The Ap or A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2.

The E horizon, if present, has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Texture of the E horizon is loamy sand or sandy loam.

The BE horizon, if present, has hue of 10YR, value of 5, and chroma of 1. The texture is sandy loam or loamy sand.

The Btg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. Mottles of higher chroma are few to common in most pedons. The texture is sandy clay loam, loam, or sandy loam.

The BC horizon, if present, has color similar to that of the Btg horizon. The texture is sandy clay loam, sandy loam, or loam.

The 2Cg horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. The texture is sand or loamy sand.

Lynchburg Series

The Lynchburg series consists of somewhat poorly drained soils on uplands. These soils formed in loamy marine sediments. Slopes are less than 2 percent.

Typical pedon of Lynchburg sandy loam in a cultivated field 6 miles southwest of Faison; 0.3 mile southwest on N.C. Highway 403 from the intersection of State Road 1900 and N.C. Highway 403, 25 feet southeast of N.C. Highway 403:

Ap—0 to 8 inches; dark gray (10YR 4/1) sandy loam; weak medium granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

E—8 to 11 inches; pale brown (10YR 6/3) sandy loam; weak medium granular structure; very friable; many fine roots; common pores filled with dark gray; strongly acid; clear wavy boundary.

Bt1—11 to 16 inches; pale brown (10YR 6/3) sandy clay loam; common fine faint light brownish gray (10YR 6/2) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; many fine roots; few pores filled with dark gray; few thin clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt2—16 to 21 inches; pale brown (10YR 6/3) sandy clay loam; common medium distinct gray (10YR 6/1) and yellowish brown (10YR 5/8) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; many fine roots; few thin clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg1—21 to 45 inches; gray (10YR 6/1) sandy clay loam; few medium distinct strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few thin clay films on faces of peds and in pores; very strongly acid; gradual wavy boundary.

Btg2—45 to 65 inches; gray (10YR 6/1) sandy clay loam; common coarse distinct yellowish brown (10YR 5/8) and common fine distinct red (2.5YR 4/8) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common thin clay films on faces of peds and in pores; very strongly acid; gradual irregular boundary.

BCg—65 to 85 inches; light brownish gray (10YR 6/2) sandy loam with layers of sandy clay loam; common medium distinct light gray (10YR 7/1) mottles; massive; few thick clay films on faces of peds and in pores; friable; very strongly acid.

Lynchburg soils have loamy horizons that extend 60 inches or more below the surface. The soil ranges from extremely acid to strongly acid unless limed.

The A or Ap horizon has hue of 10YR or 2.5Y, or it is neutral. It has value of 3 to 5 and chroma of 1 or 2.

The E horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 to 4. The texture is sandy loam or fine sandy loam. In places there is no E horizon.

The BE horizon, if present, has hue of 10YR, value of 5 or 6, and chroma of 3 to 6. The texture is sandy loam or fine sandy loam.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 or 4. It may have high and low chroma mottles. The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2 with few to common mottles of higher chroma of redder hue. Texture of the Bt and Btg horizons is sandy clay loam or sandy loam.

The BCg horizon has similar color and texture to those of the lower part of the Btg horizon. Mottles are few to many and have a higher chroma and redder hue.

Lynn Haven Series

The Lynn Haven series consists of poorly drained soils on uplands. These soils formed in sandy marine sediments. Slopes are less than 2 percent.

Typical pedon of Lynn Haven sand in a woods 0.8 mile southwest of Kerr; 1 mile northeast on State Road 1007 from the intersection of State Road 1007 and State Road 1122, 200 feet south of State Road 1007:

A—0 to 8 inches; black (N 2/0) sand; weak medium granular structure; very friable; many fine roots; about 90 percent of sand grains are coated with organic matter; very strongly acid; clear wavy boundary.

E—8 to 12 inches; gray (10YR 5/1) sand; single grained; loose; few fine roots; very strongly acid; abrupt wavy boundary.

Bh—12 to 20 inches; black (5YR 2/1) sand; massive; weakly cemented; thick organic coatings on most grains and bridging between sand grains; very strongly acid; gradual wavy boundary.

E'—20 to 32 inches; light gray (10YR 7/2) sand; single grained; loose; strongly acid; clear wavy boundary.

B'h1—32 to 42 inches; black (5YR 2/1) sand; massive; weakly cemented when moist or dry; thick humus coatings on most sand grains and bridging between sand grains; very strongly acid; gradual wavy boundary.

B'h2—42 to 70 inches; dark reddish brown (5YR 2/2) sand; massive; loose; many pockets of dark gray uncoated sand grains; very friable; extremely acid.

Lynn Haven soils are sandy to a depth of 70 inches or more. The reaction ranges from extremely acid to strongly acid.

The A or Ap horizon has hue of 10YR, or it is neutral. It has value of 2 and chroma of 0 or 1.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 1.

The Bh or B'h horizon has hue of 10YR, 7.5YR, or 5YR, value of 2 or 3, and chroma of 1 or 2. Sand grains are coated with organic matter.

The E' horizon has hue of 10YR or 2.5Y, value of 5 through 7, and chroma of 1 or 2. In places there is no E' horizon.

The C horizon, if present, is sand in shades of brown, gray, yellow, and red.

Marvyn Series

The Marvyn series consists of well drained soils that formed in loamy marine sediments. Slopes range from 6 to 12 percent.

Typical pedon of Marvyn loamy sand, 6 to 12 percent slopes, approximately 2.1 miles southwest of Keener; 0.8 mile southwest on State Road 1826 of junction of State Roads 1826 and 1746, 0.2 mile southwest of State Road 1826 on farm road, 50 feet west of farm road:

A—0 to 7 inches; brown (10YR 4/3) loamy sand; weak medium granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.

E—7 to 15 inches; pale brown (10YR 6/3) loamy sand; weak fine granular structure; very friable; few fine roots; very strongly acid; abrupt smooth boundary.

Bt1—15 to 21 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few thin clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2—21 to 31 inches; strong brown (7.5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; few thin clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—31 to 55 inches; strong brown (7.5YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; few fine rounded quartz pebbles; few thin clay films on faces of peds; very strongly acid; gradual wavy boundary.

C—55 to 64 inches; strong brown (7.5YR 5/8) sandy loam; massive; friable; common very coarse sand grains; very strongly acid.

Marvyn soils have loamy Bt horizons 40 to 60 inches thick. The soils are very strongly acid or strongly acid unless limed.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. The texture is loamy sand. In some pedons, the E horizon does not occur.

The BE horizon, if present, has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 3 to 8. The texture is sandy loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 6 or 8. The texture is sandy clay loam.

The BC horizon, if present, has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 6 to 8. The texture is sandy clay loam.

The C horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. The texture is commonly sandy loam. Some layers have thin strata of loamy sand or sandy clay loam.

Nahunta Series

The Nahunta series consists of somewhat poorly drained soils on uplands. The soils formed in loamy and silty marine sediments. Slopes are less than 2 percent.

Typical pedon of Nahunta loam in a woods 1 mile south of Halls Crossroads; 0.3 mile northwest on State Road 1416 from the intersection of State Road 1417 and State Road 1416, 50 feet southwest of State Road 1416:

A—0 to 2 inches; very dark gray (10YR 3/1) loam; weak medium granular structure; very friable; many fine roots; strongly acid; clear wavy boundary.

E—2 to 5 inches; pale brown (10YR 6/3) loam; weak medium granular structure; very friable; many fine roots; very strongly acid; clear wavy boundary.

BE—5 to 7 inches; pale brown (10YR 6/3) loam; few fine distinct light brownish gray (10YR 6/2) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; many fine roots; very strongly acid; clear wavy boundary.

Bt—7 to 24 inches; pale brown (10YR 6/3) clay loam; common medium distinct yellowish brown (10YR 5/8) and light brownish gray (10YR 6/2) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few thin clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg1—24 to 52 inches; gray (10YR 6/1) clay loam; common medium distinct yellowish brown (10YR 5/8) and few medium prominent red (2.5YR 4/8) mottles; weak fine angular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few thin clay films on faces of peds and in pores; very strongly acid; gradual wavy boundary.

Btg2—52 to 72 inches; gray (10YR 6/1) clay loam with thin stratified layers of loam; few medium distinct yellowish brown (10YR 5/8) and few coarse prominent red (2.5YR 4/8) mottles; weak fine angular blocky structure; friable, slightly sticky, slightly plastic; few thin clay films on faces of peds and in pores; very strongly acid; gradual wavy boundary.

Cg—72 to 85 inches; gray (10YR 6/1) clay loam; common medium distinct brownish yellow (10YR 6/8) and few fine prominent red (2.5YR 4/8) mottles; massive; firm, sticky, plastic; extremely acid.

Nahunta soils have loamy horizons that extend to a depth of 60 inches or more. The reaction ranges from extremely acid to strongly acid unless the soil is limed.

The A or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2.

The E horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 2 through 4; or it has hue of 2.5Y, value of 7, and chroma of 4. The texture is loam or very fine sandy loam. In places there is no E horizon.

The BE horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 8. There are few to common mottles in shades of gray, brown, and yellow. The texture is loam or silt loam. In places there is no BE horizon.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 8. Mottles in shades of gray are common to many in the upper part of the Bt horizon. The Btg horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2; or it is mottled in shades of gray, brown, yellow, and red. The Bt and Btg horizons are clay loam, loam, silty clay loam, or silt loam. The sand fraction is predominantly very fine.

The BC horizon, if present, has hue of 10YR, value of 5 to 7, and chroma of 1 or 2 and is mottled in shades of gray, brown, yellow, and red. The texture is clay loam or loam.

The Cg horizon has hue of 10YR, value of 6 or 7, and chroma of 1, with few to common mottles in shades of yellow and red. The texture is clay loam or loam.

Norfolk Series

The Norfolk series consists of well drained soils on uplands. The soils formed in loamy marine sediments. Slopes range from 0 to 6 percent.

Typical pedon of Norfolk loamy sand, 0 to 2 percent slopes, in a cultivated field 1 mile southwest of Newton Grove; 200 feet northwest of the intersection of State Road 1703 and State Road 1648:

Ap—0 to 8 inches; grayish brown (10YR 5/2) loamy sand; weak medium granular structure; very friable; many fine roots; medium acid; abrupt smooth boundary.

E—8 to 13 inches; very pale brown (10YR 7/3) loamy sand; weak medium granular structure; very friable; many fine roots; medium acid; abrupt smooth boundary.

Bt1—13 to 15 inches; yellowish brown (10YR 5/6) sandy clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; clay coating and bridging of sand grains; many fine roots; strongly acid; abrupt smooth boundary.

Bt2—15 to 37 inches; yellowish brown (10YR 5/6) sandy clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few thin clay films on faces of peds and in pores; common fine roots; very strongly acid; gradual wavy boundary.

Bt3—37 to 54 inches; yellowish brown (10YR 5/6) sandy clay loam; common coarse distinct pale brown (10YR 6/3) and common medium distinct red (2.5YR 4/8) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few thin clay films on faces of peds and in pores; very strongly acid; gradual wavy boundary.

Bt4—54 to 83 inches; mottled yellowish brown (10YR 5/6), dark gray (10YR 4/1), gray (10YR 6/1), and red (2.5YR 5/8) sandy clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common thick clay films on faces of peds and in pores; very strongly acid; gradual wavy boundary.

C—83 to 99 inches; strong brown (7.5YR 5/6) sandy loam; common medium distinct brownish yellow (10YR 6/6), yellow (10YR 7/8), red (2.5YR 5/8), and gray (10YR 5/1) mottles; massive; friable; very strongly acid.

Norfolk soils have loamy Bt horizons that extend to 60 inches or more below the surface. The reaction is very strongly acid or strongly acid unless the soil is limed.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 to 4.

The E horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 3 or 4. The texture is loamy sand, sandy loam, or fine sandy loam.

The BE horizon, if present, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 8. The texture is sandy clay loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 6 or 8, or it is mottled. The texture is sandy clay loam.

The BC horizon, if present, is mottled in shades of gray, brown, yellow, and red. The texture is sandy clay loam.

The C horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 or 8, or it is mottled in shades of gray, brown, yellow, and red. The texture is sandy loam.

Orangeburg Series

The Orangeburg series consists of well drained soils that formed in loamy marine sediments. Slopes range from 0 to 6 percent.

Typical pedon of Orangeburg loamy sand, 0 to 2 percent slopes, about 3 miles northeast of Clinton; about 1.6 miles northeast on State Road 1742 from intersection of State Roads 1756 and 1742, 400 feet east of State Road 1742 on farm road, 400 feet north of farm road, in cultivated field:

Ap—0 to 9 inches; yellowish brown (10YR 5/4) loamy sand; weak medium granular structure; very friable; common fine and medium roots; very strongly acid; abrupt smooth boundary.
Bt1—9 to 36 inches; yellowish red (5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; common fine and medium roots; very strongly acid; gradual wavy boundary.
Bt2—36 to 47 inches; yellowish red (5YR 5/8) sandy clay loam; common medium distinct reddish yellow (7.5YR 6/8) mottles; moderate medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.
Bt3—47 to 53 inches; yellowish red (5YR 5/8) sandy clay loam; common medium distinct yellow (2.5Y 7/6) mottles; moderate medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.
Bt4—53 to 66 inches; yellowish red (5YR 5/8) sandy clay loam; few medium prominent red (2.5YR 4/8) and common medium distinct yellow (2.5Y 7/6) mottles; weak medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.
Bt5—66 to 82 inches; mottled red (2.5YR 4/8), reddish yellow (7.5YR 6/8), brownish yellow (10YR 6/6), light gray (10YR 7/2), and yellow (2.5Y 7/6) sandy clay loam; weak medium subangular blocky structure; friable; very strongly acid.

Orangeburg soils have loamy B horizons that extend to 60 inches or more below the surface. The soils are very strongly acid or strongly acid unless limed.

The Ap or A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4.

The E horizon, if present, has hue of 10YR, value of 5 or 6, and chroma of 3 to 6. The texture is loamy sand or sandy loam.

The BE horizon, if present, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 6 to 8. The texture is sandy clay loam or sandy loam.

The upper part of the Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8. It has mottles in shades of red, brown, gray, or yellow. The lower part of the Bt horizon is mottled in shades of red, yellow, or gray.

The BC horizon, if present, has hue of 5YR or 7.5YR, value of 5, and chroma of 6 or 8. This horizon in some pedons is mottled in shades of brown, yellow, gray, and red. The texture is sandy clay loam or sandy loam.

Pamlico Series

The Pamlico series consists of very poorly drained organic soils. The soils formed in decomposed organic matter overlying sandy marine and fluvial sediments. Slopes are less than 1 percent.

Typical pedon of Pamlico muck about 2.1 miles northwest of Kerr along State Road 1220; 1 mile west of State Road 1220 on a woods road:

Oi—0 to 2 inches; very dark gray (10YR 3/2) mucky peat consisting of partly decomposed moss, leaves, roots, and twigs; more than 50 percent fiber after rubbing; slightly sticky; extremely acid; clear wavy boundary.
Oa1—2 to 16 inches; black (10YR 2/1) muck that remains black (10YR 2/1) when rubbed and pressed; about 10 percent fibers unrubbed and less than 4 percent rubbed; massive; nonsticky; many medium and coarse roots; extremely acid; gradual wavy boundary.
Oa2—16 to 36 inches; very dark brown (10YR 2/2) muck that remains very dark brown (10YR 2/2) when rubbed and pressed; about 25 percent fibers unrubbed and less than 5 percent rubbed; massive; slightly sticky, slightly plastic; extremely acid; gradual wavy boundary.
2C—36 to 60 inches; very dark grayish brown (10YR 3/2) loamy sand; massive; slightly sticky, slightly plastic; few partly decayed small fragments of wood; extremely acid.

Pamlico soils have 16 to 40 inches of organic material overlying sandy material. The soil ranges from extremely acid to strongly acid unless limed.

The Oi horizon has hue of 10YR or 7.5YR, or it is neutral. It has value of 2 or 3 and chroma of 0 to 2. There is no Oi horizon in places.

The Oa horizon has hue of 10YR or 7.5YR, or it is neutral. It has value of 2 or 3 and chroma of 0 to 2. Fiber content of the organic tiers is 10 to 33 percent in the unrubbed muck and less than 10 percent after rubbing.

The 2C horizon has hue of 10YR, or it is neutral. It has value of 3 to 6 and chroma of 0 or 2. The texture is sand or loamy sand.

Pantego Series

The Pantego series consists of very poorly drained soils on the uplands. The soils formed in loamy marine sediments. Slopes are less than 2 percent.

Typical pedon of Pantego loam in a cultivated field; 3 miles southwest of Faison, 0.1 mile west of the intersection of State Road 1731 and N.C. Highway 403, 0.9 mile northwest of N.C. Highway 403 on woods road:

A1—0 to 5 inches; black (N 2/0) loam; weak medium granular structure; very friable; many fine roots; strongly acid; clear irregular boundary.
A2—5 to 13 inches; very dark gray (N 3/0) loam; weak medium granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.

Btg1—13 to 18 inches; dark gray (10YR 4/1) sandy clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few large roots; few thin clay films on faces of peds; very strongly acid; clear wavy boundary.
Btg2—18 to 58 inches; grayish brown (10YR 5/2) sandy clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few thin clay films on faces of peds; very strongly acid; gradual wavy boundary.
Btg3—58 to 64 inches; gray (10YR 6/1) sandy clay loam; common medium distinct brownish yellow (10YR 6/8) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common thick clay films on faces of peds and in pores; very strongly acid; gradual wavy boundary.
Cg—64 to 85 inches; light gray (10YR 6/1) sandy loam; pockets of sandy clay loam; common coarse distinct dark gray (10YR 4/1) mottles; massive; friable, slightly sticky, slightly plastic; very strongly acid.

Pantego soils have loamy horizons that extend to 60 inches or more below the surface. The soil ranges from extremely acid to strongly acid unless limed.

The A or Ap horizon has hue of 10YR or 2.5Y, or it is neutral. It has value of 2 or 3 and chroma of 0 or 1.

The BE horizon, if present, has hue of 10YR, value of 4, and chroma of 1. The texture is sandy clay loam, loam, or sandy loam.

The Btg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. Some pedons have few to common mottles of higher chroma. The texture is sandy clay loam or clay loam.

The BCg horizon, if present, has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. The texture is sandy clay loam.

The Cg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2, with common mottles of higher chroma. The texture is sandy loam or sandy clay loam. In places the Cg horizon does not occur.

Paxville Series

The Paxville series consists of very poorly drained soils that formed in loamy marine or fluvial deposits. Slopes range from 0 to 2 percent.

Typical pedon of Paxville fine sandy loam approximately 4 miles west of Ingold; about 2 miles northwest of the intersection of U.S. Highway 701 and State Road 1206, about 1/5 mile east of State Road 1206 on farm road, 50 feet east of farm road, in field:

Ap—0 to 8 inches; black (10YR 2/1) fine sandy loam; weak medium granular structure; friable; strongly acid; clear smooth boundary.
A—8 to 14 inches; black (10YR 2/1) fine sandy loam; weak medium granular structure; friable; very strongly acid; clear wavy boundary.
Bt1—14 to 20 inches; very dark gray (10YR 3/1) sandy clay loam; weak medium subangular blocky structure; firm, slightly sticky, slightly plastic; few fine flakes of mica; few thin clay films on faces of peds; very strongly acid; clear wavy boundary.
Bt2—20 to 25 inches; very dark gray (10YR 3/1) sandy clay loam; moderate medium subangular blocky structure; firm, slightly sticky, slightly plastic; few thin clay films on faces of peds; very strongly acid; clear wavy boundary.
Btg1—25 to 28 inches; dark gray (10YR 4/1) sandy clay loam; moderate medium subangular blocky structure; firm, slightly sticky, slightly plastic; few thin clay films on faces of peds; very strongly acid; clear wavy boundary.
Btg2—28 to 46 inches; very dark gray (10YR 3/1) sandy clay loam; weak medium subangular blocky structure; firm, slightly sticky, slightly plastic; few thin clay films on faces of peds; very strongly acid; gradual wavy boundary.
Btg3—46 to 52 inches; dark gray (10YR 4/1) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few thin clay films on faces of peds; very strongly acid; clear wavy boundary.
Btg4—52 to 58 inches; dark gray (10YR 4/1) sandy clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; common pockets of sand; few fine flakes of mica; few thin clay films on faces of peds; very strongly acid; clear wavy boundary.
Cg1—58 to 74 inches; gray (5Y 5/1) loamy sand; single grained; loose; few fine flakes of mica; very strongly acid; gradual wavy boundary.
Cg2—74 to 80 inches; gray (5Y 6/1) sand; single grained; loose; few fine flakes of mica; very strongly acid.

Paxville soils have loamy horizons that extend to a depth of 40 to more than 60 inches. The soils are very strongly acid or strongly acid.

The A or Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The BEg horizon, if present, has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. The texture is sandy loam or fine sandy loam.

The Bt horizon is sandy clay loam, loam, or fine sandy loam.

The Btg horizon has hue of 10YR or 2.5Y, or it is neutral. It has value of 3 to 6 and chroma of 0 to 2. The texture is sandy clay loam, loam, or fine sandy loam.

The BCg horizon, if present, has hue of 10YR to 5Y or it is neutral. It has value of 4 or 5, and chroma of 0 to 3. The texture is sandy loam or fine sandy loam.

The Cg horizon has hue of 10YR to 5Y, or it is neutral. It has value of 4 to 6 and chroma of 0 to 3. The texture is loamy sand, sand, or fine sand.

Rains Series

The Rains series consists of poorly drained soils on uplands. The soils formed in loamy marine sediments. Slopes are less than 2 percent.

Typical pedon of Rains sandy loam in a woods 1 mile southwest of Newton Grove; 0.2 mile west of the intersection of State Road 1703 and State Road 1648, 600 feet north of State Road 1648, and 40 feet west of woods road:

A—0 to 3 inches; very dark gray (10YR 3/1) sandy loam; weak medium granular structure; very friable; many fine roots; strongly acid; clear irregular boundary.

E—3 to 5 inches; grayish brown (10YR 5/2) sandy loam; weak medium granular structure; very friable; many fine roots; many pores filled with very dark gray material; very strongly acid; clear wavy boundary.

BEg—5 to 12 inches; gray (10YR 6/1) sandy loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; many fine roots; very strongly acid; clear wavy boundary.

Btg1—12 to 48 inches; gray (10YR 6/1) sandy clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few thin clay films on faces of peds and in pores; common fine roots; very strongly acid; gradual wavy boundary.

Btg2—48 to 63 inches; gray (10YR 6/1) sandy clay loam; common fine prominent yellowish red (5YR 5/8) and red (2.5YR 4/8) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common thin clay films on faces of peds and in pores; very strongly acid; clear wavy boundary.

Btg3—63 to 76 inches; gray (10YR 5/1) sandy clay loam with pockets of sandy loam; common medium distinct yellowish brown (10YR 5/8) and red (2.5YR 5/8) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common thick clay films on faces of peds and in pores; very strongly acid; gradual wavy boundary.

Cg—76 to 96 inches; gray (10YR 5/1) sandy loam; common fine faint light gray (10YR 7/1) and common coarse distinct yellowish brown (10YR 5/6) mottles; massive; friable, slightly sticky, slightly plastic; pockets of sandy clay loam; very strongly acid.

Rains soils have loamy horizons that extend to 60 inches or more below the surface. The soils are very strongly acid or strongly acid unless limed.

The Ap or A horizon has hue of 10YR, value of 2 or 3, and chroma of 1.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. The texture is fine sandy loam, sandy loam, or loamy sand. In places there is no E horizon.

The BEg horizon has hue of 10YR to 2.5Y, value of 6 or 7, and chroma of 1 or 2. The texture is sandy loam or fine sandy loam. In some places there is no BEg horizon.

The Btg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Some pedons have high chroma mottles in shades of brown, yellow, and red. The texture is sandy clay loam or sandy clay.

The BCg horizon, if present, has hue of 10YR, value of 5 to 7, and chroma of 1, with few to many mottles of higher chroma in shades of brown, yellow, and red. The texture is sandy clay loam or sandy loam.

The Cg horizon has hue of 10YR, value of 5 to 7, and chroma of 1. Some pedons have mottles with high chroma. The texture is variable, ranging from sand to sandy clay.

Roanoke Series

The Roanoke series consists of poorly drained soils on stream terraces. These soils formed in clayey marine and fluvial sediments. Slopes are less than 2 percent.

Typical pedon of Roanoke loam in a soybean field 1.7 miles northwest of Clear Run; 1.5 miles north of the intersection of N.C. Highway 411 and State Road 1134, 0.4 mile northeast of State Road 1134, 100 feet southeast of a farm road:

Ap—0 to 4 inches; dark gray (10YR 4/1) loam; weak medium granular structure; very friable; few fine roots; medium acid; clear wavy boundary.

Btg1—4 to 8 inches; gray (10YR 5/1) clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm, slightly sticky, slightly plastic; few fine roots; few thin clay films on faces of peds; strongly acid; clear wavy boundary.

Btg2—8 to 38 inches; gray (10YR 5/1) clay; common medium distinct yellowish brown (10YR 5/8) and few fine distinct yellowish red (5YR 5/8) mottles; moderate medium prismatic structure that parts to weak medium angular blocky; firm, sticky, plastic; few fine roots to 20 inches; few thin clay films on faces of peds and in pores; very strongly acid; clear wavy boundary.

Btg3—38 to 50 inches; dark gray (10YR 4/1) clay loam; moderate medium angular blocky structure; firm, sticky, plastic; few thin clay films on faces of peds; very strongly acid; clear wavy boundary.

Btg4—50 to 56 inches; dark gray (10YR 4/1) sandy clay loam; few medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; firm, slightly sticky, slightly plastic; common thick clay films on faces of peds; very strongly acid; gradual wavy boundary.

Cg—56 to 72 inches; dark gray (10YR 4/1) sandy loam with pockets of light brownish gray (10YR 6/2) sand; massive; friable; very strongly acid.

Roanoke soils have clayey and loamy horizons that range from 40 to 60 inches or more in thickness. The soils are very strongly acid or strongly acid unless limed.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 2 to 6, and chroma of 1 or 2.

The E horizon, if present, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. The texture is fine sandy loam or loam.

The BE horizon, if present, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. The texture is clay loam, loam, or fine sandy loam.

The Btg horizon has hue of 10YR through 5Y, value of 4 to 6, and chroma of 1 or 2. High-chroma mottles are commonly present. The texture is clay, silty clay, silty clay loam, clay loam, or thin layers of sandy clay loam.

The BC horizon, if present, has hue of 10YR through 5Y, value of 4 to 6, and chroma of 1 or 2. The texture is sandy clay loam, clay loam, silty clay loam, or clay.

The Cg horizon has hue of 10YR, value of 4 to 8, and chroma of 1 or 2. The texture is sandy loam, loamy sand, or sand.

Toisnot Series

The Toisnot series consists of poorly drained soils that formed in loamy fluvial and marine sediments. Slopes range from 0 to 2 percent.

Typical pedon of Toisnot fine sandy loam 7 miles northwest of Clinton; 1 mile west on State Road 1311 from the intersection of State Road 1319 and State Road 1311, 50 feet south of State Road 1311:

Ap—0 to 5 inches; very dark gray (10YR 3/1) fine sandy loam; weak granular structure; very friable; very strongly acid; clear wavy boundary.

E1—5 to 10 inches; grayish brown (10YR 5/2) fine sandy loam; common medium faint light gray (10YR 7/1) mottles; massive; friable, slightly brittle; common fine roots; very strongly acid; clear wavy boundary.

E2—10 to 16 inches; grayish brown (10YR 5/2) fine sandy loam; common medium faint dark brown (10YR 3/3) mottles; weak granular structure; very friable; common fine roots; very strongly acid; clear wavy boundary.

Bg—16 to 30 inches; gray (10YR 6/1) sandy loam; few common distinct brownish yellow (10YR 6/6) and few fine prominent yellowish brown (10YR 5/8) mottles; weak fine subangular blocky structure; friable; few fine roots; very strongly acid; gradual wavy boundary.

Bx—30 to 50 inches; light gray (10YR 7/1) loamy sand; few medium distinct mottles of brownish yellow (10YR 6/6) and light brownish gray (10YR 6/2) and few fine prominent mottles of yellowish red (5YR 4/8); massive; very hard; difficult to cut with a spade; brittle; very strongly acid; gradual wavy boundary.

B'tg—50 to 72 inches; white (10YR 8/2) sandy clay loam; few fine distinct strong brown (7.5YR 5/8) and common medium distinct brownish yellow (10YR 6/6) mottles; weak fine subangular blocky structure; friable; common thick clay films on faces of peds; strongly acid; gradual wavy boundary.

2Cg—72 to 85 inches; light gray (10YR 7/1) stratified sandy loam and loamy sand; common medium distinct brownish yellow (10YR 6/6) mottles; massive; very friable; very strongly acid.

Depth to the fragipan ranges from 20 to 40 inches. The reaction ranges from extremely acid to strongly acid.

The Ap or A horizon has hue of 10YR or 2.5Y, or it is neutral. It has value of 2 to 4 and chroma of 0 to 1.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. The texture is fine sandy loam, sandy loam, loamy sand, or loam.

The BE horizon, if present, has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. The texture is sandy loam or fine sandy loam.

The Bg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. Higher chroma mottles are in most pedons. The texture is sandy loam or fine sandy loam. Some pedons have no Bg horizon.

The Bx horizon has hue of 10YR, value of 6 to 8, and chroma of 1 or 2. Mottles with higher chroma are in most pedons. The texture is loamy sand, sandy loam, loamy fine sand, or fine sandy loam.

The B'tg horizon has hue of 10YR, value of 4 to 8, and chroma of 1 or 2. Mottles with higher chroma are in most pedons. The texture is sandy clay loam, sandy loam, and fine sandy loam.

The 2Cg horizon has hue of 10YR, value of 7, and chroma of 1 or 2. The texture, which is variable, includes sandy, loamy, or clayey sediments.

Tomahawk Series

The Tomahawk series consists of somewhat poorly drained to moderately well drained soils on uplands. The soils formed in sandy or loamy marine sediments. Slopes range from 0 to 3 percent.

Typical pedon of Tomahawk sand 1.6 miles northwest of Kerr; 5.2 miles south of Tomahawk and 300 feet southwest of State Road 1121:

A—0 to 4 inches; very dark gray (10YR 3/1) sand; weak medium granular structure; very friable; many fine and medium roots; many uncoated sand grains; very strongly acid; clear wavy boundary.

E—4 to 24 inches; pale brown (10YR 6/3) sand; few medium faint very pale brown (10YR 7/4) mottles; weak medium granular structure; very friable; few fine roots; few medium bodies of uncoated white (10YR 8/1) sand; very strongly acid; gradual smooth boundary.

Bt1—24 to 34 inches; light yellowish brown (10YR 6/4) sandy loam; few medium prominent yellowish red (5YR 4/8) and common medium faint light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; very friable; few fine roots; common medium pores; few thin clay films on faces of peds; few coarse dark reddish brown hard nodules; very strongly acid; clear wavy boundary.

Bt2—34 to 42 inches; pale brown (10YR 6/3) sandy loam; common coarse faint light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; very friable; few thin clay films on faces of peds; very strongly acid; gradual wavy boundary.

2Bhb1—42 to 53 inches; very dark grayish brown (10YR 3/2) loamy sand; common coarse light brownish gray (10YR 6/2) mottles; massive; very friable; about 80 percent of sand grains are coated with organic matter; very strongly acid; clear wavy boundary.

2Bhb2—53 to 62 inches; dark reddish brown (5YR 3/2) sand; massive; weakly cemented; about 90 percent of sand grains are coated and bridged with organic matter; few small pockets of uncoated sand grains; slightly acid; gradual wavy boundary.

2Bhb3—62 to 80 inches; black (5YR 2/1) sand; massive; weakly cemented; most sand grains are coated and bridged with organic matter; slightly acid.

The upper sequum of the Tomahawk series ranges from 40 to 60 inches in thickness and overlies a lower sequum containing a spodic horizon. The soil is very strongly acid or strongly acid in the upper sequence of horizons unless limed and very strongly acid to slightly acid in the lower sequence of horizons.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 or 2.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 4. The E horizon in some pedons contains coarse bodies of uncoated white (10YR 8/1, 8/2) sand and few fine to medium strong brown (7.5YR 5/8, 5/6) or yellowish red (5YR 4/8) mottles. The E horizons are loamy sand, loamy fine sand, sand, or fine sand.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. Texture is sandy loam, fine sandy loam, or sandy clay loam.

The BC horizon, if present, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 4. Mottles in shades of gray, red, and high chroma are common. Some of these mottles are slightly hard to hard. Texture is fine sandy loam, sandy loam, loamy sand, or loamy fine sand.

The E' horizon, if present, has hue of 10YR or 2.5Y, value of 4 to 8, and chroma of 1 or 2. It is fine sand, sand, loamy fine sand, or loamy sand.

The 2EB or 2E'b horizon, if present, has hue of 10YR or 2.5Y, value of 4 to 8, and chroma of 1 or 2. It is fine sand, sand, loamy fine sand, or loamy sand.

The 2Bhb horizon has hue of 5YR to 10YR, value of 2 to 4, and chroma of 1 or 2. It is loamy sand, sand, or fine sand. Layers of lighter colored sandy materials are in some pedons.

Torhunta Series

The Torhunta series consists of very poorly drained soils on uplands. These soils formed in loamy marine or fluvial sediments. Slopes are less than 2 percent.

Typical pedon of Torhunta fine sandy loam in a woods 0.5 mile south of Butlers Crossroads; 0.2 mile south on U.S. Highway 701 from the intersection of State Road 1220 and U.S. Highway 701, 50 feet west of U.S. Highway 701:

A1—0 to 4 inches; black (10YR 2/1) fine sandy loam; weak medium granular structure; friable; many fine roots; strongly acid; clear wavy boundary.

A2—4 to 16 inches; very dark gray (10YR 3/1) sandy loam; weak medium granular structure; very friable; many fine roots; thin coats of organic matter on sand grains; very strongly acid; clear wavy boundary.

Bg—16 to 45 inches; gray (10YR 5/1) sandy loam; weak fine subangular blocky structure; very friable, slightly sticky, slightly plastic; many fine roots in upper part; very strongly acid; gradual wavy boundary.

Cg1—45 to 50 inches; gray (10YR 6/1) loamy sand; single grained; very friable, slightly sticky, slightly plastic; few sand pockets; very strongly acid; gradual wavy boundary.

Cg2—50 to 80 inches; light gray (10YR 7/1) loamy sand; single grained; very friable; few thin strata of sand and sandy loam; very strongly acid.

Torhunta soils have loamy horizons that range from 20 to 50 inches in thickness. The soils range from extremely acid to strongly acid unless limed.

The Ap or A horizon has hue of 10YR or 2.5Y, or it is neutral. It has value of 2 or 3 and chroma of 0 or 1.

The BEg horizon, if present, has hue of 10YR or 2.5Y or is neutral. It has value of 4 to 6 and chroma of 0 to 2. The texture is sandy loam, fine sandy loam, or loamy sand.

The Bg horizon has hue of 10YR or 2.5Y, or it is neutral. It has value of 4 to 6 and chroma of 0 to 2. The texture is sandy loam or fine sandy loam.

The BCg horizon, if present, has hue of 10YR or 2.5Y, or it is neutral. It has value of 4 to 6 and chroma of 0 to 2. The texture is loamy sand.

The Cg horizon is similar in color to the Bg horizon. The texture is loamy sand, sand, or sandy loam.

Wagram Series

The Wagram series consists of well drained soils on uplands. The soils formed in loamy marine sediments. Slopes range from 0 to 6 percent.

Typical pedon of Wagram loamy sand, 0 to 6 percent slopes, in a cultivated field 4 miles west of Clinton; 1.4 miles north of the intersection of N.C. Highway 24 and State Road 1309, 25 feet west of State Road 1309, and 0.3 mile south of bridge over State Road 1309:

Ap—0 to 7 inches; grayish brown (10YR 5/2) loamy sand; weak medium granular structure; very friable; loose when dry; many fine roots; medium acid; abrupt smooth boundary.

E—7 to 28 inches; pale brown (10YR 6/3) loamy sand; weak medium granular structure; very friable; loose when dry; few fine roots; very strongly acid; clear wavy boundary.

Bt1—28 to 32 inches; yellowish brown (10YR 5/4) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few thin clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt2—32 to 60 inches; yellowish brown (10YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few thin clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—60 to 85 inches; brownish yellow (10YR 6/8) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine gravel; few thin clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt4—85 to 99 inches; brownish yellow (10YR 6/8) sandy clay loam; common medium distinct yellow (10YR 7/8) and reddish yellow (7.5YR 6/8) mottles; weak coarse subangular blocky structure; friable, slightly sticky, slightly plastic; common thick clay films on faces of peds; very strongly acid.

Wagram soils have a loamy B horizon that extends to 60 inches or more below the surface. The soils are very strongly acid or strongly acid unless limed.

The Ap or A horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2.

The E horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 3 or 4. The texture is loamy sand, sand, or fine sand.

The BE horizon, if present, has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. The texture is sandy loam or fine sandy loam.

The B horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. It has few to common mottles in shades of brown, yellow, or red in the lower part of the B2t horizon. The texture is sandy clay loam or sandy loam.

The BC horizon, if present, is mottled in shades of gray, brown, yellow, or red. The texture is sandy clay loam or sandy loam.

Woodington Series

The Woodington series consists of poorly drained soils on uplands. The soils formed in loamy marine sediments. Slopes are less than 2 percent.

Typical pedon of Woodington loamy sand in a woods 2.1 miles southeast of Giddensville; 0.1 mile northwest on State Route 1734 from the intersection of N.C. Highway 403 and State Road 1734, 20 feet south of State Road 1730:

A—0 to 5 inches; very dark gray (10YR 3/1) loamy sand; weak medium and coarse granular structure; very friable; many fine roots; strongly acid; gradual wavy boundary.

E—5 to 10 inches; light brownish gray (10YR 6/2) loamy sand; weak medium granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.

Btg1—10 to 14 inches; gray (10YR 6/1) sandy loam; few medium distinct brownish yellow (10YR 6/6) mottles; weak fine subangular blocky structure; very friable, slightly sticky, slightly plastic; many fine roots; clay coating and bridging on sand grains; very strongly acid; clear smooth boundary.

Btg2—14 to 34 inches; gray (10YR 6/1) sandy loam; few medium distinct brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; very friable, slightly sticky, slightly plastic; few thin clay films on faces of few peds; few roots; very strongly acid; gradual wavy boundary.

Btg3—34 to 65 inches; light brownish gray (10YR 6/2) sandy loam; weak medium subangular blocky structure; very friable, slightly sticky, slightly plastic; few pockets of loamy sand; few thin clay films on faces of peds; very strongly acid; gradual wavy boundary.

Cg—65 to 70 inches; light brownish gray (10YR 6/2) loamy sand; few fine distinct brownish yellow (10YR 6/6) and common coarse faint light gray (10YR 7/1) mottles; single grained; very friable; few pockets of sandy loam; very strongly acid.

Loamy B horizons extend to 60 inches or more below the surface. The soil ranges from extremely acid to strongly acid unless limed.

The Ap or A horizon has hue of 10YR to 5Y, value of 2 to 4, and chroma of 1 or 2.

The E horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. The texture is loamy sand or sandy loam. Some pedons have no E horizon.

The Btg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. Few to common mottles in

shades of brown, yellow, or red are in some pedons. The texture is sandy loam or fine sandy loam.

The BC horizon, if present, has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. The texture is loamy sand or sandy loam.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. The texture is loamy sand or sand. Some pedons have no Cg horizon.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Bays (Carolina). Shallow, oval-shaped depressions that do not have a natural drainage outlet. Carolina bays are oriented from the northwest to the southeast and take in 5 to more than 500 acres. Most have water in them unless they are drained.

Bottom land. The normal flood plain of a stream, subject to flooding.

Broad-base terrace. A ridge-type terrace built to control erosion by diverting runoff along the contour at a nonscouring velocity. The terrace is 10 to 20 inches high and 15 to 30 feet wide and has gently sloping sides, a rounded crown, and a dish-shaped channel along the upper side. It may be nearly level or have a grade toward one or both ends.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard compacted layers to a depth below normal plow depth.

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.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse textured soil. Sand or loamy sand.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

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

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

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

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

Plastic.—When wet, readily deformed by moderate pressure 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.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, 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 classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Edge habitat. The zone of transition from one type of plant cover to another.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, and clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Arabic numeral 2 precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

No-tillage. A method of planting crops that involves no seedbed preparation other than opening the soil for the purpose of placing the seed at the intended depth. This usually involves opening a small slit or punching a hole into the soil. There is usually no

cultivation during crop production. Chemical weed control is normally used.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Pocosins. Evergreen shrub bogs that are on the southeastern coastal plains of the United States.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

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 soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has

properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. 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 either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

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

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

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 physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-76 at Clinton, North Carolina]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	54.3	31.1	41.1	77	12	186	3.76	2.41	4.98	8	1.4
February---	56.8	32.8	44.8	78	14	50	3.51	1.87	4.85	7	.4
March------	64.2	39.6	52.0	86	23	154	3.89	2.46	5.17	8	.0
April------	74.0	48.4	61.2	91	31	336	3.29	1.84	4.47	5	.0
May--------	80.9	57.1	69.0	94	39	589	4.08	2.41	5.57	7	.0
June-------	86.6	64.2	75.4	98	48	762	5.21	3.11	7.08	7	.0
July-------	89.2	67.9	78.6	98	55	887	5.82	3.02	8.10	10	.0
August-----	88.5	67.2	77.9	98	54	865	5.53	3.04	7.55	9	.0
September--	84.0	61.0	72.5	95	44	675	4.26	1.81	6.25	6	.0
October----	74.7	49.2	62.0	90	27	376	2.89	.79	4.56	5	.0
November---	65.4	39.1	52.3	83	19	116	3.01	1.40	4.32	5	.0
December---	56.5	32.3	44.5	77	12	66	3.32	1.71	4.62	6	.2
Year------	72.9	49.2	60.9	100	9	5,062	48.57	43.21	54.48	83	2.0

A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-76
at Clinton, North Carolina]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 23	April 4	April 19
2 years in 10 later than--	March 15	March 29	April 13
5 years in 10 later than--	February 28	March 18	April 3
First freezing temperature in fall:			
1 year in 10 earlier than--	November 3	October 28	October 14
2 years in 10 earlier than--	November 10	November 2	October 19
5 years in 10 earlier than--	November 21	November 11	October 29

TABLE 3.--GROWING SEASON

[Recorded in the period 1951-76
at Clinton, North Carolina]

Probability	Length of growing season if daily minimum temperature is--		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	236	214	184
8 years in 10	246	222	192
5 years in 10	265	237	208
2 years in 10	285	252	224
1 year in 10	294	260	232

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
Au	Autryville loamy sand, 0 to 6 percent slopes	35,581	5.8
AyB	Aycock silt loam, 1 to 4 percent slopes	7,897	1.3
BH	Bibb and Johnston soils, frequently flooded	44,294	7.2
BoB	Blanton sand, 0 to 6 percent slopes	32,729	5.3
CaB	Cainhoy sand, 0 to 5 percent slopes	13,876	2.3
ChA	Chipley sand	13,306	2.2
Co	Coxville loam	2,781	0.4
ExA	Exum silt loam	4,987	0.8
FaA	Faceville fine sandy loam, 0 to 2 percent slopes	1,972	0.3
FaB	Faceville fine sandy loam, 2 to 6 percent slopes	4,851	0.8
Fo	Foreston loamy sand	6,414	1.0
GoA	Goldsboro loamy sand	33,859	5.5
Gr	Grantham loam	3,708	0.6
GtC	Gritney fine sandy loam, 4 to 8 percent slopes	2,666	0.4
Jo	Johns fine sandy loam	13,526	2.2
JT	Johnston loam	22,879	3.7
KaA	Kalmia loamy sand, 0 to 3 percent slopes	3,130	0.5
LeA	Leon sand	14,427	2.3
Lm	Lumbee sandy loam	7,862	1.3
Ln	Lynchburg sandy loam	22,129	3.6
Lu	Lynchburg-Urban land complex	416	0.1
Ly	Lynn Haven sand	20,971	3.4
MaC	Marvyn loamy sand, 6 to 12 percent slopes	24,639	4.0
Na	Nahunta loam	2,408	0.4
NoA	Norfolk loamy sand, 0 to 2 percent slopes	52,960	8.6
NoB	Norfolk loamy sand, 2 to 6 percent slopes	39,739	6.4
NuB	Norfolk-Urban land complex, 0 to 6 percent slopes	2,182	0.4
OrA	Orangeburg loamy sand, 0 to 2 percent slopes	1,703	0.3
OrB	Orangeburg loamy sand, 2 to 6 percent slopes	1,816	0.3
Pm	Pamlico muck	1,533	0.2
Pn	Pantego loam	3,883	0.6
Px	Paxville fine sandy loam	8,091	1.3
Ra	Rains sandy loam	64,067	10.4
Ro	Roanoke loam	642	0.1
Tn	Toisnot fine sandy loam	1,943	0.3
To	Tomahawk sand	3,464	0.6
Tr	Torhunta fine sandy loam	6,877	1.1
UD	Udorthents, loamy	937	0.2
WaB	Wagram loamy sand, 0 to 6 percent slopes	71,535	11.6
Wo	Woodington loamy sand	10,643	1.7
	Water	2,997	0.5
	Total	616,320	100.0

TABLE 5.--YIELDS PER ACRE OF TRUCK CROPS

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the crop generally is not grown on the soil or that there is no data on which to base an estimate. Only arable soils are listed in the table]

Map symbol and soil name	Squash		Green beans	Asparagus	Cool-season greens	Watermelon	Eggplant	Tomato	Grapes	Cucumber		Cubanelle pepper
	Green	Yellow								Fresh	Pickling	
	Bu	Bu	Bu	Ton	Bu	Cwt	Bu	Bu	Ton	Bu	Bu	Bu
Au---------- Autryville	275	250	275	1.5	110	120	275	200	8.0	225	275	250
AyB---------- Aycock	305	275	325	---	150	110	375	300	8.0	300	350	375
BoB---------- Blanton	225	200	225	1.0	---	110	---	---	9.0	200	250	---
CaB---------- Cainhoy	---	---	---	1.0	---	100	---	---	---	---	---	---
Co---------- Coxville	---	---	275	---	---	---	---	---	---	---	---	---
ExA---------- Exum	300	275	325	---	150	105	375	300	---	300	350	375
FaA---------- Faceville	300	275	325	1.5	150	110	375	300	8.0	300	350	375
FaB---------- Faceville	290	265	315	1.5	140	165	365	290	7.5	290	340	365
Fo---------- Foreston	275	250	290	---	110	---	300	225	---	250	300	260
GoA---------- Goldsboro	300	275	325	---	150	110	375	300	---	300	350	375
Gr---------- Grantham	250	225	275	---	---	---	---	---	---	---	---	---
Jo---------- Johns	270	245	275	---	115	105	---	---	---	250	300	275
KaA---------- Kalmia	270	245	275	---	120	110	360	285	8.5	275	325	300
Lm---------- Lumbee	---	---	260	---	---	---	---	---	---	---	---	---
Ln---------- Lynchburg	280	255	300	---	---	---	300	225	---	---	300	325
Na---------- Nahunta	270	245	275	---	---	---	300	225	---	---	300	325
NoA---------- Norfolk	305	280	325	1.5	150	110	375	300	9.5	300	350	360
NoB---------- Norfolk	295	270	315	1.5	140	105	365	290	9.0	290	340	350
OrA---------- Orangeburg	305	280	325	1.5	150	110	375	300	9.5	300	350	360
OrB---------- Orangeburg	295	270	315	1.5	140	105	365	290	9.0	290	340	350

TABLE 5.--YIELDS PER ACRE OF TRUCK CROPS--Continued

Map symbol and soil name	Squash		Green beans	Asparagus	Cool-season greens	Watermelon	Eggplant	Tomato	Grapes	Cucumber		Cubanelle pepper
	Green	Yellow								Fresh	Pickling	
	Bu	Bu	Bu	Ton	Bu	Cwt	Bu	Bu	Ton	Bu	Bu	Bu
Pn---------- Pantego	250	225	275	---	---	---	---	---	---	---	300	---
Ra---------- Rains	250	225	275	---	---	---	---	---	---	---	300	---
To---------- Tomahawk	250	225	260	---	110	105	---	---	---	---	---	---
Tr---------- Torhunta	250	225	275	---	---	---	---	---	---	---	300	---
WaB---------- Wagram	275	250	275	1.5	115	120	275	200	8.0	225	275	250
Wo---------- Woodington	250	225	275	---	---	---	---	---	---	---	300	---

TABLE 6.--YIELDS PER ACRE OF CROPS

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil. Only arable soils are listed in the table]

Map symbol and soil name	Corn	Soybeans	Tobacco	Cotton lint	Sweetpotatoes
	Bu	Bu	Lb	Lb	Bu
Au---- Autryville	75	30	2,200	600	190
AyB---- Aycock	120	40	2,700	700	---
BoB---- Blanton	60	25	2,000	---	185
CaB---- Cainhoy	55	20	---	---	160
ChA---- Chipley	50	20	2,000	---	---
Co---- Coxville	110	40	---	---	---
ExA---- Exum	125	50	3,000	750	---
FaA---- Faceville	115	45	---	875	235
FaB---- Faceville	115	45	---	875	235
Fo---- Foreston	120	35	2,600	700	---
GoA---- Goldsboro	125	45	3,000	700	220
GtC---- Gritney	45	30	---	---	---
Jo---- Johns	120	45	2,700	650	---
JT---- Johnston	---	---	---	---	---
KaA---- Kalmia	110	45	2,900	750	---
LeA---- Leon	50	---	---	---	---
Lm---- Lumbee	110	45	---	---	---
Ln---- Lynchburg	115	45	2,800	675	---
Ly---- Lynn Haven	70	---	---	---	---

TABLE 6.--YIELDS PER ACRE OF CROPS--Continued

Map symbol and soil name	Corn	Soybeans	Tobacco	Cotton lint	Sweetpotatoes
	Bu	Bu	Lb	Lb	Bu
MaC---------- Marvyn	60	35	---	650	---
Na---------- Nahunta	120	45	2,800	675	---
NoA---------- Norfolk	110	40	3,000	700	235
NoB---------- Norfolk	100	35	2,900	650	235
OrA---------- Orangeburg	120	45	2,400	900	235
OrB---------- Orangeburg	120	45	2,400	900	235
Pn---------- Pantego	135	50	---	---	---
Px---------- Paxville	110	40	---	---	---
Ra---------- Rains	110	40	2,300	450	---
To---------- Tomahawk	75	25	2,400	500	---
Tr---------- Torhunta	120	40	---	---	---
WaB---------- Wagram	75	25	2,400	550	200
Wo---------- Woodington	100	35	---	---	---

TABLE 7.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	59,765	---	---	---
II	249,945	55,764	87,065	107,116
III	174,878	24,639	117,510	32,729
IV	52,582	2,666	36,040	13,876
V	23,475	---	23,475	---
VI	3,708	---	3,708	---
VII	45,230	---	45,230	---
VIII	---	---	---	---

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Map symbol and soil name	Ordination symbol	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	
Au---------- Autryville	3s	Slight	Moderate	Moderate	Loblolly pine--------	77	Loblolly pine, longleaf pine.
					Slash pine----------	---	
					Longleaf pine--------	---	
AyB---------- Aycock	2o	Slight	Slight	Slight	Slash pine----------	89	Loblolly pine.
					Loblolly pine--------	89	
					Longleaf pine--------	75	
					Southern red oak-----	80	
BH*:							
Bibb----------	2w	Slight	Severe	Severe	Loblolly pine--------	90	Eastern cottonwood, loblolly pine, sweetgum, yellow-poplar.
					Sweetgum------------	90	
					Water oak-----------	90	
					Blackgum------------	---	
Johnston----------	1w	Slight	Severe	Severe	Water tupelo---------	---	Loblolly pine, baldcypress, American sycamore, sweetgum, green ash.
					Swamp tupelo---------	---	
					Water oak-----------	90	
					Pond pine-----------	---	
					Baldcypress----------	---	
					Loblolly pine--------	90	
BoB---------- Blanton	3s	Slight	Moderate	Moderate	Slash pine----------	90	Loblolly pine.
					Loblolly pine--------	80	
					Longleaf pine--------	70	
					Bluejack oak---------	---	
					Turkey oak-----------	---	
					Southern red oak-----	---	
					Live oak------------	---	
CaB---------- Cainhoy	3s	Slight	Moderate	Moderate	Longleaf pine--------	70	Longleaf pine.
					Loblolly pine--------	76	
ChA---------- Chipley	2s	Slight	Moderate	Slight	Slash pine----------	90	Loblolly pine.
					Loblolly pine--------	90	
					Longleaf pine--------	80	
					Post oak------------	---	
					Turkey oak-----------	---	
					Blackjack oak--------	---	
Co---------- Coxville	2w	Slight	Severe	Severe	Loblolly pine--------	90	Loblolly pine.
					Longleaf pine--------	71	
					Sweetgum------------	90	
					Blackgum------------	---	
					Water oak-----------	90	
					Willow oak----------	90	
					Water tupelo---------	---	
					Elm-----------------	---	
					Hickory-------------	---	
ExA---------- Exum	2w	Slight	Moderate	Slight	Loblolly pine--------	90	Loblolly pine, yellow-poplar, sweetgum, American sycamore.
					Longleaf pine--------	77	
					Sweetgum------------	90	
					Yellow-poplar--------	100	
					Southern red oak-----	---	
					White oak-----------	---	
FaA, FaB---------- Faceville	3o	Slight	Slight	Slight	Loblolly pine--------	82	Loblolly pine.
					Slash pine----------	80	
					Longleaf pine--------	65	
Fo---------- Foreston	2w	Slight	Moderate	Slight	Slash pine----------	90	Loblolly pine.
					Loblolly pine--------	90	
					Longleaf pine--------	75	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	
GoA---- Goldsboro	2w	Slight	Moderate	Slight	Loblolly pine----	90	Loblolly pine, yellow-poplar, American sycamore, sweetgum.
					Slash pine----	93	
					Longleaf pine----	77	
					Sweetgum----	90	
					Southern red oak----	---	
					White oak----	---	
Gr---- Grantham	2w	Slight	Severe	Severe	Loblolly pine----	95	Loblolly pine, sweetgum, American sycamore, yellow-poplar.
GtC---- Gritney	3o	Slight	Slight	Slight	Slash pine----	80	Loblolly pine.
					Loblolly pine----	80	
					Longleaf pine----	65	
Jo---- Johns	2w	Slight	Moderate	Slight	Loblolly pine----	86	Loblolly pine.
					Sweetgum----	90	
					Slash pine----	86	
JT---- Johnston	1w	Slight	Severe	Severe	Water tupelo----	---	Loblolly pine, baldcypress, American sycamore, sweetgum, green ash.
					Swamp tupelo----	---	
					Water oak----	90	
					Pond pine----	---	
					Baldcypress----	---	
					Loblolly pine----	90	
KaA---- Kalmia	2o	Slight	Slight	Slight	Loblolly pine----	88	Loblolly pine, yellow-poplar, cherrybark oak.
					Slash pine----	88	
					Sweetgum----	85	
					Yellow-poplar----	96	
					Southern red oak----	---	
					White oak----	---	
LeA---- Leon	4w	Slight	Moderate	Moderate	Slash pine----	70	
					Longleaf pine----	65	
Lm---- Lumbee	2w	Slight	Severe	Severe	Loblolly pine----	94	Loblolly pine, water tupelo, sweetgum.
					Slash pine----	91	
					Pond pine----	---	
					Water tupelo----	---	
					Sweetgum----	---	
					White oak----	---	
Ln---- Lynchburg	2w	Slight	Moderate	Slight	Slash pine----	91	Loblolly pine, American sycamore, sweetgum.
					Loblolly pine----	86	
					Longleaf pine----	74	
					Yellow-poplar----		
					Sweetgum----	90	
					Southern red oak----	---	
					White oak----	---	
					Blackgum----	---	
Ly---- Lynn Haven	3w	Slight	Moderate	Moderate	Slash pine----	90	Loblolly pine.
					Loblolly pine----	80	
					Longleaf pine----	70	
					Pond pine----	70	
MaC---- Marvyn	2o	Slight	Slight	Slight	Loblolly pine----	90	Loblolly pine.
					Shortleaf pine----	80	
					Longleaf pine----	80	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	
Na---------- Nahunta	2w	Slight	Moderate	Moderate	Loblolly pine--------- Slash pine---------- Sweetgum---------- Yellow-poplar--------- Southern red oak----- White oak----------	87 86 90 100 --- ---	Loblolly pine, yellow-poplar, American sycamore, cherrybark oak.
NoA, NoB---------- Norfolk	2o	Slight	Slight	Slight	Loblolly pine--------- Longleaf pine--------- Slash pine----------	86 68 86	Loblolly pine.
OrA, OrB---------- Orangeburg	2o	Slight	Slight	Slight	Loblolly pine--------- Slash pine---------- Longleaf pine---------	80 86 77	Loblolly pine.
Pm---------- Pamlico	4w	Slight	Severe	Severe	Slash pine---------- Pond pine---------- Baldcypress---------- Water tupelo---------	70 55 --- ---	Loblolly pine, water tupelo.
Pn---------- Pantego	1w	Slight	Severe	Severe	Loblolly pine--------- Slash pine---------- Pond pine---------- Baldcypress---------- Water tupelo--------- Water oak----------	98 95 73 --- --- ---	Loblolly pine, sweetgum, American sycamore, water tupelo.
Px---------- Paxville	1w	Slight	Severe	Severe	Loblolly pine--------- Slash pine---------- Pond pine---------- Water oak---------- Water tupelo--------- Baldcypress----------	96 92 77 90 --- ---	Loblolly pine, American sycamore, water tupelo.
Ra---------- Rains	2w	Slight	Severe	Severe	Loblolly pine--------- Slash pine---------- Sweetgum----------	94 91 90	Loblolly pine, sweetgum, American sycamore.
Ro---------- Roanoke	2w	Slight	Severe	Severe	Loblolly pine--------- Virginia pine--------- Willow oak---------- Yellow-poplar--------- White oak----------	86 76 76 90 ---	Loblolly pine, sweetgum, yellow-poplar.
Tn---------- Toisnot	3w	Slight	Severe	Severe	Loblolly pine--------- Slash pine---------- Sweetgum----------	80 80 80	Loblolly pine, sweetgum.
To---------- Tomahawk	3w	Slight	Moderate	Moderate	Loblolly pine--------- Longleaf pine--------- Slash pine----------	80 70 80	Loblolly pine, longleaf pine.
Tr---------- Torhunta	2w	Slight	Severe	Severe	Loblolly pine--------- Slash pine---------- Sweetgum---------- Water tupelo---------	90 86 90 ---	Loblolly pine, sweetgum, American sycamore, Shumard oak.
WaB---------- Wagram	3s	Slight	Moderate	Moderate	Loblolly pine--------- Slash pine---------- Longleaf pine---------	82 80 67	Loblolly pine, longleaf pine.
Wo---------- Woodington	3w	Slight	Severe	Severe	Slash pine---------- Loblolly pine--------- Sweetgum---------- White oak---------- Southern red oak----- Water tupelo---------	83 83 --- --- 71 ---	Loblolly pine, American sycamore, water tupelo, water oak, sweetgum.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Au Autryville	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
AyB Aycock	Moderate: percs slowly.	Slight	Moderate: slope.	Slight	Slight.
BH*: Bibb	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Johnston	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
BoB Blanton	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
CaB Cainhoy	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
ChA Chipley	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
Co Coxville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Exa Exum	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Slight.
FaA Faceville	Slight	Slight	Slight	Slight	Slight.
FaB Faceville	Slight	Slight	Moderate: slope.	Slight	Slight.
Fo Foreston	Slight	Slight	Slight	Slight	Moderate: droughty.
GoA Goldsboro	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight	Slight.
Gr Grantham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
GtC Gritney	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
Jo Johns	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
JT Johnston	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
KaA Kalmia	Severe: flooding.	Slight	Slight	Slight	Moderate: droughty.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
LeA--- Leon	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
Lm--- Lumbee	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ln--- Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Lu*: Lynchburg---	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Urban land.					
Ly--- Lynn Haven	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
MaC--- Marvyn	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight---	Moderate: slope.
Na--- Nahunta	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
NoA--- Norfolk	Slight---	Slight---	Slight---	Slight---	Slight.
NoB--- Norfolk	Slight---	Slight---	Moderate: slope.	Slight---	Slight.
NuB*: Norfolk---	Slight---	Slight---	Moderate: slope.	Slight---	Slight.
Urban land.					
OrA--- Orangeburg	Slight---	Slight---	Slight---	Slight---	Slight.
OrB--- Orangeburg	Slight---	Slight---	Moderate: slope.	Slight---	Slight.
Pm--- Pamlico	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness.	Severe: wetness, excess humus.	Severe: wetness, excess humus.
Pn--- Pantego	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Px--- Paxville	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Ra--- Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ro--- Roanoke	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Tn---------- Toisnot	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
To---------- Tomahawk	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, droughty, too sandy.
Tr---------- Torhunta	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
UD. Udorthents					
WaB---------- Wagram	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
Wo---------- Woodington	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Au---- Autryville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
AyB---- Aycock	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BH*:										
Bibb----	Very poor.	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Johnston----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
BoB---- Blanton	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
CaB---- Cainhoy	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Poor	Very poor.
ChA---- Chipley	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Co---- Coxville	Good	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
ExA---- Exum	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
FaA---- Faceville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
FaB---- Faceville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Fo---- Foreston	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
GoA---- Goldsboro	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Gr---- Grantham	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
GtC---- Gritney	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Jo---- Johns	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
JT---- Johnston	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
KaA---- Kalmia	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LeA---- Leon	Poor	Poor	Fair	Poor	Poor	Poor	Very poor.	Poor	Poor	Very poor.
Lm---- Lumbee	Fair	Good	Good	Good	Good	Poor	Fair	Fair	Fair	Fair.
Ln---- Lynchburg	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Lu*: Lynchburg	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Urban land.										
Ly--Lynn Haven	Poor	Poor	Fair	Poor	Poor	Poor	Poor	Poor	Poor	Poor.
MaC--Marvyn	Poor	Fair	Fair	Poor	Poor	Very poor.	Poor	Fair	Poor	Poor.
Na--Nahunta	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
NoA, NoB--Norfolk	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
NuB*: Norfolk	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Urban land.										
OrA, OrB--Orangeburg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Pm--Pamlico	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Pn--Pantego	Fair	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
Px--Paxville	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Good	Good.
Ra--Rains	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Good	Good.
Ro--Roanoke	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Tn--Toisnot	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
To--Tomahawk	Fair	Good	Good	Fair	Fair	Poor	Poor	Good	Good	Poor.
Tr--Torhunta	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Fair.
UD. Udorthents										
WaB--Wagram	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Wo--Woodington	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition and does not eliminate the need for onsite investigation]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Au---------- Autryville	Moderate: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty.
AyB---------- Aycock	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Moderate: low strength.	Slight.
BH*: Bibb----------	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
Johnston---------	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding.	Severe: ponding, flooding.
BoB---------- Blanton	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Severe: droughty.
CaB---------- Cainhoy	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
ChA---------- Chipley	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
Co---------- Coxville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
ExA---------- Exum	Moderate: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Slight.
FaA---------- Faceville	Moderate: too clayey.	Slight---------	Slight---------	Slight---------	Moderate: low strength.	Slight.
FaB---------- Faceville	Moderate: too clayey.	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength.	Slight.
Fo---------- Foreston	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty.
GoA---------- Goldsboro	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Slight.
Gr---------- Grantham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
GtC---------- Gritney	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
Jo---------- Johns	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Moderate: wetness.
JT---------- Johnston	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding.	Severe: ponding, flooding.
KaA---------- Kalmia	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Moderate: droughty.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
LeA---------- Leon	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
Lm---------- Lumbee	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.
Ln---------- Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Lu*: Lynchburg--------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Urban land.						
Ly---------- Lynn Haven	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
MaC---------- Marvyn	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength.	Moderate: slope.
Na---------- Nahunta	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
NoA---------- Norfolk	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Slight.
NoB---------- Norfolk	Moderate: wetness.	Slight---------	Moderate: wetness.	Moderate: slope.	Slight---------	Slight.
NuB*: Norfolk----------	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Slight.
Urban land.						
OrA---------- Orangeburg	Slight---------	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
OrB---------- Orangeburg	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
Pm---------- Pamlico	Severe: cutbanks cave, excess humus, wetness.	Severe: wetness, low strength.	Severe: wetness.	Severe: wetness, low strength.	Severe: wetness.	Severe: wetness, excess humus.
Pn---------- Pantego	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Px---------- Paxville	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.
Ra---------- Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ro---------- Roanoke	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness.	Severe: wetness.
Tn---------- Toisnot	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: cemented pan, wetness, flooding.	Severe: wetness.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
To---------- Tomahawk	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty, too sandy.
Tr---------- Torhunta	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
UD. Udorthents						
WaB---------- Wagram	Slight---------	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
Wo---------- Woodington	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition and does not eliminate the need for onsite investigation]

Map symbol and soil name	Septic tank absorption fields	Waste lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Au Autryville	Moderate: wetness.	Severe: seepage.	Slight	Severe: seepage.	Fair: too sandy.
AyB Aycock	Severe: percs slowly.	Moderate: seepage, slope, wetness.	Moderate: too clayey.	Slight	Fair: too clayey.
BH*:					
Bibb	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Johnston	Severe: flooding, ponding, poor filter.	Severe: seepage, flooding, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: seepage, ponding.
BoB Blanton	Moderate: wetness.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: too sandy, seepage.
CaB Cainhoy	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
ChA Chipley	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy, seepage.
Co Coxville	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: wetness.
ExA Exum	Severe: wetness.	Slight	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
FaA Faceville	Slight	Moderate: seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
FaB Faceville	Slight	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Fo Foreston	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Fair: wetness.
GoA Goldsboro	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
Gr Grantham	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: seepage, wetness.	Poor: wetness.
GtC Gritney	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Waste lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Jo Johns	Severe: wetness.	Severe: seepage, flooding, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage.
JT Johnston	Severe: flooding, ponding, poor filter.	Severe: seepage, flooding, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: seepage, ponding.
KaA Kalmia	Slight	Severe: seepage, flooding.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage.
LeA Leon	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Lm Lumbee	Severe: wetness.	Severe: seepage, flooding, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
Ln Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Lu*: Lynchburg Urban land.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Ly Lynn Haven	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
MaC Marvyn	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
Na Nahunta	Severe: wetness.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
NoA, NoB Norfolk	Moderate: wetness.	Moderate: seepage.	Slight	Slight	Good.
NuB*: Norfolk Urban land.	Moderate: wetness.	Moderate: seepage.	Slight	Slight	Good.
OrA Orangeburg	Slight	Moderate: seepage.	Slight	Slight	Good.
OrB Orangeburg	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
Pm Pamlico	Severe: wetness, poor filter.	Severe: seepage, excess humus, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Pn Pantego	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Waste lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Px---------- Paxville	Severe: ponding, poor filter.	Severe: seepage, flooding, ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Poor: ponding.
Ra---------- Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Ro---------- Roanoke	Severe: wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Tn---------- Toisnot	Severe: cemented pan.	Severe: cemented pan, flooding.	Severe: wetness.	Severe: wetness.	Poor: area reclaim, wetness.
To---------- Tomahawk	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness, seepage.	Severe: seepage, wetness.	Poor: thin layer.
Tr---------- Torhunta	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
UD. Udorthents					
WaB---------- Wagram	Slight----------	Moderate: seepage.	Slight----------	Slight----------	Good.
Wo---------- Woodington	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition and does not eliminate the need for onsite investigation]

Map symbol and soil name	Roadfill	Sand	Topsoil
Au Autryville	Good	Improbable: thin layer.	Fair: too sandy.
AyB Aycock	Fair: low strength.	Improbable: excess fines.	Fair: too clayey.
BH*: Bibb	Poor: wetness.	Improbable: excess fines.	Poor: wetness.
Johnston	Poor: wetness.	Improbable: excess fines.	Poor: wetness.
BoB Blanton	Good	Probable	Poor: too sandy.
CaB Cainhoy	Good	Probable	Poor: too sandy.
ChA Chipley	Fair: wetness.	Probable	Poor: too sandy.
Co Coxville	Poor: wetness, low strength.	Improbable: excess fines.	Poor: thin layer, wetness.
ExA Exum	Fair: wetness.	Improbable: excess fines.	Good.
FaA, FaB Faceville	Fair: low strength.	Improbable: excess fines.	Poor: thin layer.
Fo Foreston	Fair: wetness.	Improbable: thin layer.	Good.
GoA Goldsboro	Fair: wetness.	Improbable: excess fines.	Fair: too sandy.
Gr Grantham	Poor: low strength, wetness.	Improbable: excess fines.	Poor: wetness.
GtC Gritney	Poor: shrink-swell, low strength.	Improbable: excess fines.	Poor: thin layer.
Jo Johns	Fair: wetness.	Probable	Fair: thin layer.
JT Johnston	Poor: wetness.	Improbable: excess fines.	Poor: wetness.
KaA Kalmia	Good	Probable	Fair: too sandy, thin layer.
LeA Leon	Poor: wetness.	Probable	Poor: too sandy, wetness.
Lm Lumbee	Poor: wetness.	Probable	Poor: wetness.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Topsoil
Ln---------- Lynchburg	Poor: wetness.	Improbable: excess fines.	Poor: wetness.
Lu*: Lynchburg----------	Poor: wetness.	Improbable: excess fines.	Poor: wetness.
Urban land.			
Ly---------- Lynn Haven	Poor: wetness.	Probable----------	Poor: too sandy, wetness.
MaC---------- Marvyn	Fair: low strength.	Improbable: excess fines.	Fair: thin layer, slope.
Na---------- Nahunta	Poor: low strength.	Improbable: excess fines.	Good.
NoA, NoB---------- Norfolk	Good----------	Improbable: excess fines.	Fair: too sandy.
NuB*: Norfolk----------	Good----------	Improbable: excess fines.	Fair: too sandy.
Urban land.			
OrA, OrB---------- Orangeburg	Good----------	Improbable: excess fines.	Fair: too sandy.
Pm---------- Pamlico	Poor: wetness.	Probable----------	Poor: excess humus, wetness.
Pn---------- Pantego	Poor: wetness.	Improbable: excess fines.	Poor: wetness.
Px---------- Paxville	Poor: wetness.	Probable----------	Poor: wetness.
Ra---------- Rains	Poor: wetness.	Improbable: excess fines.	Poor: wetness.
Ro---------- Roanoke	Poor: wetness.	Improbable: excess fines.	Poor: thin layer, wetness.
Tn---------- Toisnot	Poor: wetness.	Improbable: excess fines.	Poor: wetness.
To---------- Tomahawk	Fair: wetness.	Probable----------	Poor: too sandy.
Tr---------- Torhunta	Poor: wetness.	Probable----------	Poor: wetness.
UD. Udorthents			
WaB---------- Wagram	Good----------	Improbable: excess fines.	Fair: too sandy.
Wo---------- Woodington	Poor: wetness.	Probable----------	Poor: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition and does not eliminate the need for onsite investigation]

Map symbol and soil name	Limitations for--		Features affecting--			
	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Au---------- Autryville	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Too sandy------	Droughty.
AyB---------- Aycock	Moderate: piping.	Severe: slow refill.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
BH*:						
Bibb----------	Severe: piping, wetness.	Moderate: slow refill.	Flooding-------	Wetness, flooding.	Wetness--------	Wetness.
Johnston---------	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, flooding, cutbanks cave.	Ponding, flooding.	Ponding--------	Wetness.
BoB---------- Blanton	Severe: seepage.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
CaB---------- Cainhoy	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
ChA---------- Chipley	Severe: seepage.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
Co---------- Coxville	Severe: wetness.	Severe: slow refill.	Favorable------	Wetness--------	Wetness--------	Wetness.
ExA---------- Exum	Moderate: piping, wetness.	Moderate: deep to water.	Favorable------	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
FaA---------- Faceville	Slight---------	Severe: no water.	Deep to water	Favorable------	Favorable------	Favorable.
FaB---------- Faceville	Slight---------	Severe: no water.	Deep to water	Slope----------	Favorable------	Favorable.
Fo---------- Foreston	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, soil blowing.	Droughty.
GoA---------- Goldsboro	Moderate: wetness.	Moderate: deep to water.	Favorable------	Wetness, fast intake.	Wetness--------	Favorable.
Gr---------- Grantham	Severe: wetness.	Moderate: slow refill.	Favorable------	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
GtC---------- Gritney	Moderate: hard to pack.	Severe: no water.	Deep to water	Percs slowly, slope, soil blowing.	Percs slowly, erodes easily, soil blowing.	Erodes easily, percs slowly.
Jo---------- Johns	Moderate: wetness.	Slight---------	Favorable------	Wetness--------	Wetness--------	Favorable.
JT---------- Johnston	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, flooding, cutbanks cave.	Ponding, flooding.	Ponding--------	Wetness.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--		Features affecting--			
	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
KaA---- Kalmia	Slight----	Severe: no water.	Deep to water	Droughty, fast intake.	Too sandy----	Droughty.
LeA---- Leon	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
Lm---- Lumbee	Severe: wetness.	Slight----	Cutbanks cave	Wetness----	Wetness----	Wetness.
Ln---- Lynchburg	Severe: piping, wetness.	Moderate: slow refill.	Favorable----	Wetness----	Wetness----	Wetness.
Lu*: Lynchburg----	Severe: piping, wetness.	Moderate: slow refill.	Favorable----	Wetness----	Wetness----	Wetness.
Urban land.						
Ly---- Lynn Haven	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
MaC---- Marvyn	Moderate: piping, hard to pack.	Severe: no water.	Deep to water	Fast intake, slope.	Slope----	Slope.
Na---- Nahunta	Severe: wetness.	Moderate: slow refill.	Favorable----	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
NoA---- Norfolk	Slight----	Severe: deep to water.	Deep to water	Fast intake----	Favorable----	Favorable.
NoB---- Norfolk	Slight----	Severe: deep to water.	Deep to water	Slope----	Favorable----	Favorable.
NuB*: Norfolk----	Slight----	Severe: deep to water.	Deep to water	Slope----	Favorable----	Favorable.
Urban land.						
OrA---- Orangeburg	Moderate: piping.	Severe: no water.	Deep to water	Fast intake----	Favorable----	Favorable.
OrB---- Orangeburg	Moderate: piping.	Severe: no water.	Deep to water	Fast intake, slope.	Favorable----	Favorable.
Pm---- Pamlico	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Subsides, cutbanks cave.	Wetness, rooting depth.	Wetness, too sandy.	Wetness, rooting depth.
Pn---- Pantego	Severe: wetness.	Moderate: slow refill.	Favorable----	Wetness----	Wetness----	Wetness.
Px---- Paxville	Severe: piping, ponding.	Severe: cutbanks cave.	Ponding----	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.
Ra---- Rains	Severe: piping, wetness.	Moderate: slow refill.	Favorable----	Wetness, soil blowing.	Wetness, soil blowing.	Wetness.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--		Features affecting--			
	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Ro---------- Roanoke	Severe: wetness.	Severe: slow refill.	Percs slowly---	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Tn---------- Toisnot	Severe: piping, wetness.	Severe: slow refill, cutbanks cave.	Percs slowly, cemented pan, flooding, cutbanks cave.	Wetness, percs slowly, cemented pan.	Cemented pan, wetness.	Wetness, droughty.
To---------- Tomahawk	Severe: piping, wetness, seepage.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness--------	Droughty.
Tr---------- Torhunta	Severe: piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness--------	Wetness--------	Wetness.
UD. Udorthents						
WaB---------- Wagram	Slight---------	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Favorable------	Droughty.
Wo---------- Woodington	Severe: piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, fast intake.	Wetness--------	Wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated. Some soils may have Unified classifications and USDA textures in addition to those shown. In general, the dominant classifications and textures are shown. NP means nonplastic]

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Au	0-26	Loamy sand	SP-SM, SM	A-2, A-3	0	100	100	50-100	5-20	---	NP
Autryville	26-41	Sandy loam, sandy clay loam, fine sandy loam.	SM	A-2	0	100	100	50-100	15-30	<25	NP-3
	41-58	Sand, loamy sand, loamy fine sand.	SP-SM, SM	A-2, A-3	0	100	100	50-100	5-20	---	NP
	58-85	Sandy loam, sandy clay loam, fine sandy loam.	SM, SC, SM-SC	A-2, A-4	0	100	100	60-100	20-49	<30	NP-10
AyB	0-11	Silt loam	ML, CL-ML, CL	A-4	0	100	95-100	80-100	51-80	<25	NP-10
Aycock	11-85	Clay loam, silty clay loam, loam.	CL	A-4, A-6, A-7	0	100	95-100	90-100	60-90	22-49	8-30
BH*:											
Bibb	0-6	Loamy sand	SM, SP-SM	A-2, A-3	0-5	95-100	90-100	40-90	8-35	---	NP
	6-80	Sandy loam, loam, silt loam.	SM, SM-SC, ML, CL-ML	A-2, A-4	0-10	60-100	50-100	40-100	30-90	<30	NP-7
Johnston	0-37	Loam	ML, SM	A-2, A-4	0	100	100	60-100	18-65	<35	NP-10
	37-62	Stratified loamy sand to sand.	SM, SP-SM	A-2, A-3	0	100	100	50-100	5-30	---	NP
BoB	0-48	Sand	SP-SM	A-3, A-2-4	0	100	100	65-100	5-12	---	NP
Blanton	48-58	Sandy loam, loamy sand, loamy coarse sand.	SM	A-2-4	0	100	100	65-96	13-30	<25	NP-3
	58-85	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM-SC, SM	A-4, A-2-4, A-2-6, A-6	0	100	100	69-96	25-50	<45	3-22
CaB	0-66	Sand	SP-SM, SM	A-3, A-2	0	100	100	80-100	5-18	---	NP
Cainhoy	66-99	Fine sand, sand	SP-SM, SP	A-3	0	100	100	80-100	3-10	---	NP
ChA	0-6	Sand	SP-SM	A-3, A-2-4	0	100	100	80-100	6-12	---	NP
Chipley	6-80	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	100	75-100	5-12	---	NP
Co	0-10	Loam	SM, ML, CL-ML, CL	A-4, A-6, A-7	0	100	100	85-97	46-75	20-46	3-15
Coxville	10-64	Clay loam, sandy clay, clay.	CL, CH	A-6, A-7	0	100	100	85-98	50-85	30-55	12-35
	64-85	Variable	---	---	0	---	---	---	---	---	---
ExA	0-13	Silt loam	ML, CL-ML, CL	A-4	0	100	95-100	80-100	51-80	<25	NP-10
Exum	13-85	Loam, clay loam, silty clay loam.	CL	A-4, A-6, A-7	0	100	95-100	90-100	60-90	22-49	8-30
FaA, FaB	0-14	Fine sandy loam	SM, SM-SC	A-2, A-4	0	90-100	85-100	72-97	17-38	<25	NP-7
Faceville	14-99	Sandy clay, clay, clay loam.	CL, SC, CH	A-6, A-7	0	98-100	95-100	75-99	45-72	25-52	11-25
Fo	0-6	Loamy sand	SM	A-2	0	100	100	60-100	15-30	---	NP
Foreston	6-23	Sandy loam, fine sandy loam.	SM	A-2	0	100	100	70-100	18-35	<25	NP-4
	23-67	Loamy fine sand, loamy sand, fine sand.	SP-SM, SM	A-2, A-3	0	100	100	50-98	6-25	---	NP
	67-85	Variable	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
GoA---------- Goldsboro	0-10	Loamy sand-------	SM, SM-SC, SC	A-2, A-4, A-6	0	90-100	75-100	50-95	15-45	<25	NP-14
	10-96	Sandy clay loam, sandy loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6	0	98-100	95-100	60-95	25-55	16-37	4-18
	96-99	Variable---------	---	---	---	---	---	---	---	---	---
Gr---------- Grantham	0-9	Loam-------------	ML, CL-ML	A-4	0	100	100	85-100	55-85	<30	NP-7
	9-85	Loam, clay loam, silty clay loam.	CL	A-4, A-6, A-7	0	100	100	90-100	60-95	22-49	8-30
GtC---------- Gritney	0-12	Fine sandy loam	SM, SM-SC	A-2-4, A-4	0	100	95-100	75-99	18-42	<30	NP-6
	12-15	Sandy clay loam, sandy clay, clay loam.	SC, CL	A-6, A-7	0	100	95-100	80-100	36-60	35-48	15-25
	15-58	Sandy clay, clay, clay loam.	CH, CL, SC	A-7	0	100	95-100	80-100	45-70	44-62	22-40
	58-85	Sandy clay loam	CH, CL, SC	A-7	0	100	95-100	80-100	40-55	40-55	20-35
Jo---------- Johns	0-12	Fine sandy loam	SM, SM-SC, SC	A-2, A-4	---	100	95-100	70-98	20-49	<30	NP-10
	12-36	Sandy clay loam, sandy loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6, A-7	---	100	95-100	60-98	30-65	20-45	4-25
	36-65	Sand, loamy sand	SM, SP-SM, SP	A-2, A-3	---	95-100	95-100	51-90	4-25	---	NP
JT---------- Johnston	0-37	Loam-------------	ML, SM	A-2, A-4	0	100	100	60-100	18-65	<35	NP-10
	37-70	Stratified loamy sand to sand.	SM, SP-SM	A-2, A-3	0	100	100	50-100	5-30	---	NP
KaA---------- Kalmia	0-13	Loamy sand-------	SM, SM-SC, SC	A-2	0	100	95-100	50-75	15-35	---	NP
	13-36	Sandy clay loam	SC, SM-SC	A-2, A-4, A-6	0	100	95-100	70-100	30-49	20-35	4-15
	36-65	Loamy sand, sand	SM, SP-SM, SP	A-2, A-3	0	100	95-100	50-70	4-35	---	NP
LeA---------- Leon	0-22	Sand-------------	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	22-46	Sand, fine sand, loamy sand.	SM, SP-SM, SP	A-3, A-2-4	0	100	100	80-100	3-20	---	NP
	46-70	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
Lm---------- Lumbee	0-8	Sandy loam-------	SM, SM-SC	A-2, A-4	0	100	85-100	65-98	15-45	<20	NP-7
	8-39	Sandy clay loam, sandy loam, clay loam.	SC, CL	A-4, A-6, A-7	0	100	90-100	65-98	36-60	19-45	7-25
	39-65	Loamy sand, sand, fine sand.	SP, SM, SP-SM	A-2, A-3	0	90-100	85-100	50-90	4-25	---	NP
Ln---------- Lynchburg	0-11	Sandy loam-------	SM, ML, SM-SC, CL-ML	A-2, A-4	0	92-100	90-100	75-100	25-55	<30	NP-7
	11-85	Sandy clay loam, sandy loam, clay loam.	SM-SC, SC, CL, CL-ML	A-2, A-4, A-6	0	92-100	90-100	70-100	25-67	15-40	4-18
Lu*:											
Lynchburg-------	0-11	Sandy loam-------	SM, ML, SM-SC, CL-ML	A-2, A-4	0	92-100	90-100	75-100	25-55	<30	NP-7
	11-85	Sandy clay loam, sandy loam, clay loam.	SM-SC, SC, CL, CL-ML	A-2, A-4, A-6	0	92-100	90-100	70-100	25-67	15-40	4-18
Urban land.											

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Ly---------- Lynn Haven	0-12	Sand----------	SP, SP-SM, SM	A-3, A-2-4	0	100	100	80-100	2-14	---	NP
	12-20	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2-4	0	100	100	70-100	5-20	---	NP
	20-70	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	70-100	2-12	---	NP
MaC---------- Marvyn	0-15	Loamy sand-------	SM	A-2, A-4	0	95-100	90-100	50-75	15-40	---	NP
	15-55	Sandy clay loam, sandy loam.	ML, SC, SM-SC, SM	A-4, A-5	0	95-100	90-100	60-80	30-55	24-45	3-15
	55-64	Loamy sand, sandy loam, sandy clay loam.	SM, SC, ML, CL	A-1, A-2, A-4	0	95-100	90-100	45-85	20-55	<40	NP-10
Na---------- Nahunta	0-5	Loam----------	ML, CL-ML, CL	A-4	0	100	95-100	80-100	51-85	<25	NP-10
	5-85	Loam, clay loam, silty clay loam.	CL	A-4, A-6, A-7	0	100	95-100	90-100	60-95	22-49	8-30
NoA, NoB--------- Norfolk	0-13	Loamy sand-------	SM	A-2	0	95-100	92-100	50-91	13-30	<20	NP
	13-37	Sandy loam, sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	95-100	91-100	70-96	30-55	20-38	4-15
	37-83	Sandy clay loam, clay loam, sandy clay.	SC, SM-SC, CL, CL-ML	A-4, A-6, A-7-6	0	100	98-100	65-98	36-72	20-45	4-22
	83-99	Variable---------	---	---	---	---	---	---	---	---	---
NuB*: Norfolk---------	0-13	Loamy sand-------	SM	A-2	0	95-100	92-100	50-91	13-30	<20	NP
	13-37	Sandy loam, sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	95-100	91-100	70-96	30-55	20-38	4-15
	37-83	Sandy clay loam, clay loam, sandy clay.	SC, SM-SC, CL, CL-ML	A-4, A-6, A-7-6	0	100	98-100	65-98	36-72	20-45	4-22
	83-99	Variable---------	---	---	---	---	---	---	---	---	---
Urban land.											
OrA, OrB--------- Orangeburg	0-9	Loamy sand-------	SM	A-2	0	98-100	95-100	60-87	14-28	---	NP
	9-53	Sandy clay loam, sandy loam.	SC, CL, SM, SM-SC	A-6, A-4	0	98-100	95-100	71-96	38-58	22-40	3-19
	53-82	Sandy clay loam, sandy clay, sandy loam.	SC, CL	A-6, A-4 A-7	0	98-100	95-100	70-67	40-65	24-46	8-21
Pm---------- Pamlico	0-36	Muck----------	PT	---	0	---	---	---	---	---	---
	36-60	Loamy sand, sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	100	70-95	5-20	---	NP
Pn---------- Pantego	0-13	Loam----------	SM, SM-SC, CL, ML	A-2, A-4	0	100	95-100	60-95	25-75	<35	NP-10
	13-85	Sandy clay loam, sandy loam, clay loam.	SC, CL, SM-SC, CL-ML	A-4, A-6, A-2	0	100	95-100	80-100	30-80	20-40	4-16
Px---------- Paxville	0-14	Fine sandy loam	SM, ML	A-2, A-4	0	100	100	80-98	30-60	<35	NP-7
	14-58	Sandy clay loam, sandy loam, loam.	CL-ML, CL, SM-SC, SC	A-2, A-4, A-6	0	100	98-100	60-98	30-60	25-40	5-15
	58-80	Loamy sand, sand, fine sand.	SM, SP-SM	A-2, A-3, A-1	0	100	98-100	45-65	5-25	---	NP

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Ra---------- Rains	0-12	Sandy loam-------	SM, ML	A-2, A-4	0	100	95-100	50-85	25-56	<35	NP-10
	12-63	Sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	100	95-100	55-98	30-70	18-40	4-20
	63-76	Sandy clay loam, clay loam, sandy clay.	SC, SM-SC, CL, CL-ML	A-4, A-6, A-7	0	100	98-100	60-98	36-72	18-45	4-28
	76-96	Sandy loam, sandy clay loam, sandy clay.	SM, SC, ML, CL	A-2, A-4, A-6	0	100	95-100	60-95	30-60	15-40	3-18
Ro---------- Roanoke	0-4	Loam----------	SM-SC, CL-ML, CL, SC	A-4, A-6	0	95-100	85-100	60-100	35-90	20-35	5-16
	4-56	Clay loam, silty clay loam.	SM, ML, CL	A-6, A-7	0	95-100	85-100	80-100	80-95	35-45	14-20
	56-72	Sandy loam, loamy sand, sand.	SM, ML	A-2, A-4,	0-5	40-100	35-100	25-95	15-55	<35	NP-10
Tn---------- Toisnot	0-16	Fine sandy loam	CL-ML, CL, ML	A-4, A-6	0	100	100	85-95	60-75	20-30	5-15
	16-30	Sandy loam, fine sandy loam, silt loam.	SM, SM-SC, SC, ML	A-2, A-4	0	100	100	60-90	30-65	<25	NP-10
	30-50	Loamy sand, sandy loam.	SM, SM-SC	A-2, A-4	0	100	100	50-75	20-49	<25	NP-7
	50-85	Sandy clay loam, sandy clay, loam.	CL, SC, CL-ML	A-4, A-6	0	100	100	80-95	36-65	20-40	4-20
To---------- Tomahawk	0-24	Sand----------	SM, SP-SM	A-2-4, A-1-b	0	100	95-100	40-70	10-30	---	NP
	24-42	Sandy loam, fine sandy loam.	SM, SC, SM-SC	A-2-4, A-4	0	100	95-100	50-80	20-49	<25	NP-10
	42-80	Fine sand, sand, loamy sand.	SM, SP-SM	A-2-4, A-1-b, A-3	0	100	95-100	35-65	5-20	---	NP
Tr---------- Torhunta	0-16	Fine sandy loam	SM	A-2, A-4	0	100	95-100	70-85	20-49	<25	NP-4
	16-45	Sandy loam, fine sandy loam.	SM, SM-SC	A-2, A-4	0	100	95-100	70-85	20-40	<25	NP-7
	45-80	Loamy sand, sand, sandy loam.	SM, SP-SM	A-2, A-3	0	100	95-100	65-85	5-25	<25	NP-4
UD. Udorthents											
WaB---------- Wagram	0-28	Loamy sand-------	SM, SP-SM	A-2, A-3	0	100	98-100	50-85	8-35	---	NP
	28-99	Sandy clay loam, sandy loam.	SC	A-2, A-4, A-6, A-7	0	100	98-100	60-95	31-49	21-41	8-25
Wo---------- Woodington	0-10	Loamy sand-------	SM	A-2	0	100	95-100	50-100	15-49	---	NP
	10-65	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	100	95-100	50-100	20-50	<25	NP-3
	65-70	Sandy loam, loamy sand, loamy fine sand.	SM, SP-SM	A-2, A-4	0	100	95-100	50-100	10-50	<25	NP-3

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
Au	0-26	2-10	1.60-1.70	>6.0	0.04-0.09	4.5-6.5	Low	0.10	5	.5-1
Autryville	26-41	10-25	1.40-1.60	2.0-6.0	0.08-0.13	4.5-5.5	Low	0.10		
	41-58	2-8	1.60-1.70	>6.0	0.03-0.08	4.5-5.5	Low	0.10		
	58-85	10-35	1.40-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.17		
AyB	0-11	4-15	1.30-1.60	2.0-6.0	0.15-0.20	4.5-6.0	Low	0.37	5	1-4
Aycock	11-85	18-35	1.30-1.60	0.2-2.0	0.15-0.20	4.5-5.5	Low	0.43		
BH*:										
Bibb	0-6	2-12	1.40-1.65	6.0-20.0	0.06-0.10	4.5-5.5	Low	0.15	5	<1
	6-80	2-18	1.30-1.60	0.6-2.0	0.12-0.20	4.5-5.5	Low	0.37		
Johnston	0-37	5-18	1.30-1.55	2.0-6.0	0.10-0.20	4.5-5.5	Low	0.20	5	3-8
	37-62	2-12	1.55-1.65	6.0-20	0.02-0.07	4.5-5.5	Low	0.17		
BoB	0-48	1-7	1.30-1.60	6.0-20	0.03-0.07	4.5-6.0	Low	0.10	5	.5-1
Blanton	48-58	10-18	1.53-1.65	2.0-6.0	0.10-0.15	4.5-5.5	Low	0.15		
	58-85	12-30	1.60-1.70	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.20		
CaB	0-66	2-15	1.40-1.70	6.0-20	0.05-0.08	4.5-6.5	Low	0.10	5	<1
Cainhoy	66-99	1-10	1.40-1.70	6.0-20	0.05-0.08	4.5-6.5	Low	0.10		
ChA	0-6	1-5	1.35-1.45	6.0-20	0.05-0.10	3.6-6.0	Low	0.10	5	2-5
Chipley	6-80	1-7	1.45-1.60	6.0-20	0.03-0.08	4.5-6.5	Low	0.10		
Co	0-10	5-27	1.45-1.65	0.6-2.0	0.12-0.17	3.6-5.5	Low	0.24	5	2-4
Coxville	10-64	35-60	1.25-1.45	0.2-0.6	0.14-0.18	3.6-5.5	Moderate	0.32		
	64-85	---	---	---	---	---	---	---		
ExA	0-13	6-18	1.30-1.50	2.0-6.0	0.15-0.20	4.5-6.0	Low	0.37	5	.5-2
Exum	13-85	18-35	1.30-1.40	0.2-0.6	0.15-0.20	4.5-5.5	Low	0.37		
FaA, FaB	0-14	5-20	---	6.0-20	0.06-0.09	4.5-5.5	Low	0.28	5	.5-2
Faceville	14-99	35-55	---	0.6-2.0	0.12-0.15	4.5-5.5	Low	0.37		
Fo	0-6	5-12	1.20-1.40	6.0-20	0.05-0.10	4.5-6.5	Low	0.15	5	.5-2
Foreston	6-23	10-18	1.20-1.40	2.0-6.0	0.09-0.13	4.5-5.5	Low	0.10		
	23-67	4-12	1.30-1.60	6.0-20	0.03-0.10	4.5-5.5	Low	0.10		
	67-85	---	---	---	---	---	---	---		
GoA	0-10	5-15	1.40-1.60	2.0-6.0	0.08-0.12	4.5-6.0	Low	0.20	5	.5-2
Goldsboro	10-96	18-30	1.30-1.50	0.6-2.0	0.11-0.15	4.5-5.5	Low	0.24		
	96-99	---	---	---	---	---	---	---		
Gr	0-9	6-18	1.30-1.50	2.0-6.0	0.13-0.20	4.5-5.5	Low	0.37	5	2-4
Grantham	9-85	18-35	1.30-1.40	0.2-0.6	0.15-0.20	3.6-5.5	Low	0.43		
GtC	0-12	8-30	1.50-1.60	6.0-20	0.10-0.15	4.5-5.5	Low	0.24	3	1-4
Gritney	12-15	30-45	1.55-1.65	0.6-2.0	0.10-0.15	4.5-5.5	Moderate	0.37		
	15-58	35-60	1.55-1.70	0.06-0.2	0.10-0.15	4.5-5.5	High	0.37		
	58-85	20-35	1.50-1.65	0.2-0.6	0.10-0.15	4.5-5.5	High	0.37		
Jo	0-12	5-15	1.45-1.65	2.0-6.0	0.10-0.15	4.5-5.5	Low	0.20	5	.5-2
Johns	12-36	18-35	1.40-1.60	0.6-2.0	0.12-0.15	4.5-5.5	Low	0.24		
	36-65	2-10	1.60-1.75	6.0-20	0.03-0.06	4.5-5.5	Low	0.10		
JT	0-37	5-18	1.30-1.55	2.0-6.0	0.10-0.20	4.5-5.5	Low	0.20	5	3-8
Johnston	37-70	2-12	1.55-1.65	6.0-20	0.02-0.07	4.5-5.5	Low	0.17		
KaA	0-13	4-12	1.60-1.75	2.0-6.0	0.06-0.10	4.5-6.0	Low	0.15	5	.5-2
Kalmia	13-36	18-35	1.40-1.60	0.6-2.0	0.12-0.16	4.5-5.5	Low	0.24		
	36-65	2-10	1.60-1.75	6.0-20	0.03-0.06	4.5-5.5	Low	0.10		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
LeA----------	0-22	1-6	1.40-1.65	6.0-20	0.02-0.05	3.6-5.5	Low----------	0.10	5	.5-4
Leon	22-46	2-8	1.50-1.70	0.6-6.0	0.05-0.10	3.6-5.5	Low----------	0.20		
	46-70	1-6	1.40-1.65	0.6-6.0	0.02-0.05	3.6-5.5	Low----------	0.17		
Lm----------	0-8	4-18	1.55-1.70	2.0-6.0	0.08-0.12	4.5-5.5	Low----------	0.24	5	2-4
Lumbee	8-39	18-35	1.30-1.45	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	0.32		
	39-65	1-10	1.60-1.75	6.0-20	0.03-0.06	4.5-5.5	Low----------	0.10		
Ln----------	0-11	5-20	1.30-1.60	2.0-6.0	0.09-0.13	3.6-5.5	Low----------	0.20	5	.5-5
Lynchburg	11-85	18-35	1.30-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low----------	0.20		
Lu*:										
Lynchburg-------	0-11	5-20	1.30-1.60	2.0-6.0	0.09-0.13	3.6-5.5	Low----------	0.20	5	.5-5
	11-85	18-35	1.30-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low----------	0.20		
Urban land.										
Ly----------	0-12	1-4	1.35-1.60	6.0-20	0.05-0.10	3.6-5.5	Low----------	0.10	5	1-4
Lynn Haven	12-20	2-8	1.40-1.55	0.6-6.0	0.10-0.20	3.6-5.5	Low----------	0.15		
	20-70	2-5	1.50-1.65	>20	0.01-0.05	3.6-5.5	Low----------	0.10		
MaC----------	0-15	2-15	---	2.0-6.0	0.07-0.12	4.5-6.0	Low----------	0.24	3	<2
Marvyn	15-55	18-35	---	0.6-2.0	0.12-0.17	4.5-6.0	Low----------	0.32		
	55-64	10-30	---	0.2-2.0	0.07-0.14	4.5-6.0	Low----------	0.32		
Na----------	0-5	6-18	1.30-1.50	2.0-6.0	0.15-0.20	4.5-6.0	Low----------	0.43	5	2-4
Nahunta	5-85	18-35	1.30-1.40	0.2-0.6	0.15-0.20	3.6-5.5	Low----------	0.43		
NoA, NoB---------	0-13	2-8	1.55-1.75	6.0-20	0.06-0.11	4.5-6.0	Low----------	0.20	5	.5-2
Norfolk	13-37	18-35	1.35-1.45	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.24		
	37-83	20-40	1.30-1.40	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.24		
	83-99	---	---	---	---	---	----------	----		
NuB*:										
Norfolk---------	0-13	2-8	1.55-1.75	6.0-20	0.06-0.11	4.5-6.0	Low----------	0.20	5	.5-2
	13-37	18-35	1.35-1.45	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.24		
	37-83	20-40	1.30-1.40	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.24		
	83-99	---	---	---	---	---	----------	----		
Urban land.										
OrA, OrB---------	0-9	4-10	---	2.0-6.0	0.06-0.09	4.5-6.0	Low----------	0.10	5	.5-1
Orangeburg	9-53	18-35	---	0.6-2.0	0.11-0.14	4.5-5.5	Low----------	0.24		
	53-82	20-45	---	0.6-2.0	0.11-0.14	4.5-5.5	Low----------	0.24		
Pm----------	0-36	---	0.40-0.65	0.6-6.0	0.24-0.26	3.6-4.4	Low----------	----	---	20-80
Pamlico	36-60	5-10	1.60-1.75	6.0-20	0.03-0.06	3.6-5.5	Low----------	0.10		
Pn----------	0-13	5-15	1.40-1.60	2.0-6.0	0.10-0.20	3.6-5.5	Low----------	0.15	5	4-10
Pantego	13-85	18-35	1.30-1.40	0.6-2.0	0.12-0.20	3.6-5.5	Low----------	0.28		
Px----------	0-14	8-25	1.30-1.40	2.0-6.0	0.12-0.16	4.5-6.5	Low----------	0.20	5	2-9
Paxville	14-58	18-35	1.20-1.50	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.15		
	58-80	2-12	1.30-1.60	6.0-20	0.05-0.08	4.5-5.5	Low----------	0.10		
Ra----------	0-12	5-20	1.30-1.60	2.0-6.0	0.08-0.12	4.5-6.5	Low----------	0.20	5	1-6
Rains	12-63	18-35	1.30-1.50	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.24		
	63-76	18-40	1.30-1.50	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.28		
	76-96	15-45	1.30-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.28		
Ro----------	0-4	10-27	1.20-1.50	0.6-2.0	0.14-0.20	3.6-5.5	Low----------	0.37	4	.5-2
Roanoke	4-56	20-35	1.20-1.50	0.2-0.6	0.16-0.19	3.6-5.5	Moderate-----	0.24		
	56-72	5-15	1.20-1.50	0.06-20	0.04-0.14	3.6-6.5	Moderate-----	0.24		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
Tn----------	0-16	5-25	1.30-1.50	2.0-6.0	0.15-0.20	4.5-5.5	Low----------	0.28	5	.5-2
Toisnot	16-30	5-15	1.50-1.70	0.2-0.6	0.10-0.15	4.5-5.5	Low----------	0.32		
	30-50	5-15	1.50-1.70	0.06-0.2	0.-0.06	4.5-5.5	Low----------	0.43		
	50-85	15-30	1.25-1.35	0.06-0.2	0.10-0.18	4.5-5.5	Low----------	0.37		
To----------	0-24	2-8	1.60-1.75	6.0-20	0.04-0.10	4.5-5.5	Low----------	0.10	5	.5-2
Tomahawk	24-42	5-15	1.45-1.65	2.0-6.0	0.10-0.14	4.5-5.5	Low----------	0.15		
	42-80	2-8	1.60-1.75	6.0-20	0.04-0.08	4.5-6.5	Low----------	0.10		
Tr----------	0-16	5-18	1.35-1.65	2.0-6.0	0.10-0.15	3.6-5.5	Low----------	0.15	5	3-10
Torhunta	16-45	5-18	1.35-1.60	2.0-6.0	0.10-0.15	3.6-5.5	Low----------	0.15		
	45-80	2-18	1.45-1.65	6.0-20	<0.05	3.6-6.5	Low----------	0.10		
UD.										
Udorthents										
WaB----------	0-28	2-10	1.60-1.75	6.0-20	0.05-0.08	4.5-6.0	Low----------	0.15	5	.5-2
Wagram	28-99	10-35	1.35-1.60	0.6-2.0	0.12-0.16	4.5-6.0	Low----------	0.20		
Wo----------	0-10	2-10	1.50-1.70	6.0-20	0.06-0.11	3.6-5.5	Low----------	0.10	5	2-4
Woodington	10-65	5-18	1.45-1.65	2.0-6.0	0.10-0.15	3.6-5.5	Low----------	0.20		
	65-70	3-18	1.45-1.65	2.0-20	0.06-0.15	3.6-5.5	Low----------	0.10		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Map symbol and soil name	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth*	Kind	Months	Uncoated steel	Concrete
					Ft				
Au---------- Autryville	A	None--------	---	---	4.0-6.0	Apparent	Jan-Apr	Low------	High.
AyB---------- Aycock	B	None--------	---	---	4.0-6.0	Perched	Jan-Apr	Moderate	High.
BH**:									
Bibb----------	C	Frequent----	Brief-----	Dec-May	0.5-1.5	Apparent	Dec-Apr	High-----	Moderate.
Johnston----------	D	Frequent----	Brief to long.	Nov-Jul	+1-1.5	Apparent	Nov-Jun	High-----	High.
BoB---------- Blanton	A	None--------	---	---	5.0-6.0	Perched	Dec-Mar	High-----	High.
CaB---------- Cainhoy	A	None--------	---	---	>6.0	---	---	Low------	Moderate.
ChA---------- Chipley	C	None--------	---	---	2.0-3.0	Apparent	Dec-Apr	Low------	High.
Co---------- Coxville	D	None--------	---	---	0-1.5	Apparent	Nov-Apr	High-----	High.
ExA---------- Exum	C	None--------	---	---	2.0-3.0	Apparent	Dec-Apr	Moderate	High.
FaA, FaB---------- Faceville	B	None--------	---	---	>6.0	---	---	Low------	Moderate.
Fo---------- Foreston	C	None--------	---	---	2.5-3.5	Apparent	Dec-Apr	Moderate	High.
GoA---------- Goldsboro	B	None--------	---	---	2.0-3.0	Apparent	Dec-Apr	Moderate	High.
Gr---------- Grantham	D	None--------	---	---	0-1.0	Apparent	Dec-May	High-----	High.
GtC---------- Gritney	C	None--------	---	---	>6.0	---	---	High-----	Moderate.
Jo---------- Johns	C	Rare--------	---	---	1.5-3.0	Apparent	Dec-Apr	Moderate	High.
JT---------- Johnston	D	Frequent----	Long------	Nov-Jul	+1-1.5	Apparent	Nov-Jun	High-----	High.
KaA---------- Kalmia	B	Rare--------	---	---	>6.0	---	---	Moderate	Moderate.
LeA---------- Leon	B/D	None--------	---	---	0-1.0	Apparent	Jun-Feb	High-----	High.
Lm---------- Lumbee	B/D	Rare--------	---	---	0-1.5	Apparent	Nov-Apr	High-----	High.
Ln---------- Lynchburg	C	None--------	---	---	0.5-1.5	Apparent	Nov-Apr	High-----	High.
Lu**:									
Lynchburg--------	C	None--------	---	---	0.5-1.5	Apparent	Nov-Apr	High-----	High.

See footnotes at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth*	Kind	Months	Uncoated steel	Concrete
					Ft				
Lu**: Urban land.									
Ly---- Lynn Haven	B/D	None----	---	---	0-1.0	Apparent	Jun-Feb	High----	High.
MaC---- Marvyn	B	None----	---	---	>6.0	---	---	Moderate	High.
Na---- Nahunta	C	None----	---	---	1.0-2.5	Apparent	Dec-May	High----	High.
NoA, NoB---- Norfolk	B	None----	---	---	4.0-6.0	Apparent	Jan-Mar	Moderate	High.
NuB**: Norfolk----	B	None----	---	---	4.0-6.0	Apparent	Jan-Mar	Moderate	High.
Urban land.									
OrA, OrB---- Orangeburg	B	None----	---	---	>6.0	---	---	Moderate	Moderate.
Pm---- Pamlico	D	Rare----	---	---	0-1.0	Apparent	Dec-May	High----	High.
Pn---- Pantego	B/D	None----	---	---	0-1.5	Apparent	Dec-May	High----	High.
Px---- Paxville	B/D	Rare----	---	---	+1-1.0	Apparent	Nov-Apr	High----	High.
Ra---- Rains	B/D	None----	---	---	0-1.0	Apparent	Nov-Apr	High----	High.
Ro---- Roanoke	D	Rare----	---	---	0-1.0	Apparent	Nov-May	High----	High.
Tn---- Toisnot	B/D	None----	---	---	0-1.0	Apparent	Dec-Apr	High----	High.
To---- Tomahawk	A	None----	---	---	1.5-3.0	Apparent	Dec-Apr	Moderate	High.
Tr---- Torhunta	C	None----	---	---	0.5-1.5	Apparent	Dec-May	High----	High.
UD. Udorthents									
WaB---- Wagram	A	None----	---	---	>6.0	---	---	Low----	High.
Wo---- Woodington	B/D	None----	---	---	0.5-1.0	Apparent	Dec-May	High----	High.

* A plus sign preceding the range in depth indicates the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--ENGINEERING INDEX TEST DATA

[Dashes indicate data were not available. NP means nonplastic]

Soil name report number, horizon, and depth in inches	Classification		Grain-size distribution							Liquid limit	Plasticity index	Moisture density	
			Percentage passing sieve--				Percentage smaller than--						
	AASHTO	Unified	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			Max. dry density	Optimum moisture
										Pct		Lb/ft^3	Pct
Chipley sand: S74NC-82-19(1-5)													
Bw--------6 to 26	A-3(0)	SP-SM	100	100	88	6	5	4	3	--	NP	103.4	16.0
C3-------44 to 80	A-3(0)	SP-SM	100	100	77	5	4	4	3	--	NP	106.7	16.2
Faceville fine sandy loam: S74NC-82-7(1-5)													
Ap--------0 to 8	A-2-4(0)	SM	100	100	84	31	12	5	4	--	NP	119.3	8.2
Bt1------14 to 63	A-7-6(11)	CL	100	100	88	62	47	42	41	46	21	108.0	18.0
Johns fine sandy loam: S74NC-82-10(1-6)													
Ap--------0 to 8	A-2-4(0)	SM	100	100	96	32	16	9	6	--	NP	114.6	11.6
Bt1------15 to 25	A-7-6(11)	CL	100	100	98	62	46	39	36	44	24	104.4	17.3
2Cg------36 to 65	A-3(0)	SP-SM	100	100	90	5	4	4	3	--	NP	99.7	18.6
Lynn Haven sand: S74NC-82-29(1-5)													
A---------0 to 8	A-2-4(0)	SM	100	100	81	13	7	3	1	--	NP	96.2	19.6
Bh--------12 to 20	A-2-4(0)	SM	100	100	80	16	13	9	7	--	NP	109.3	14.5
E'-------20 to 32	A-3(0)	SP-SM	100	100	72	7	4	2	2	--	NP	108.8	14.6
Tomahawk sand: S74NC-82-31(1-7)													
E---------4 to 24	A-2-4(0)	SP-SM	100	100	61	12	9	5	3	--	NP	114.9	11.6
Bt1------24 to 34	A-2-4(0)	SM	100	100	60	25	21	15	10	14	3	128.0	9.4
2Bhb2-----53 to 62	A-3(0)	SP-SM	100	100	56	7	6	3	2	--	NP	111.2	14.6

TABLE 19.--CLASSIFICATION OF THE SOILS

Soil name	Family	Subgroup*	Great group	Suborder	Order
Autryville	Loamy, siliceous, thermic	Arenic Paleudults	Paleudults	Udults	Ultisols.
Aycock	Fine-silty, siliceous, thermic	Typic Paleudults	Paleudults	Udults	Ultisols.
Bibb	Coarse-loamy, siliceous, acid, thermic.	Typic Fluvaquents	Fluvaquents	Aquents	Entisols.
Blanton	Loamy, siliceous, thermic	Grossarenic Paleudults	Paleudults	Udults	Ultisols.
Cainhoy	Thermic, coated	Typic Quartzipsamments	Quartzipsamments	Psamments	Entisols.
Chipley	Thermic, coated	Aquic Quartzipsamments	Quartzipsamments	Psamments	Entisols.
Coxville	Clayey, kaolinitic, thermic	Typic Paleaquults	Paleaquults	Aquults	Ultisols.
Exum	Fine-silty, siliceous, thermic	Aquic Paleudults	Paleudults	Udults	Ultisols.
Faceville	Clayey, kaolinitic, thermic	Typic Paleudults	Paleudults	Udults	Ultisols.
Foreston	Coarse-loamy, siliceous, thermic.	Aquic Paleudults	Paleudults	Udults	Ultisols.
Goldsboro	Fine-loamy, siliceous, thermic	Aquic Paleudults	Paleudults	Udults	Ultisols.
Grantham	Fine-silty, siliceous, thermic	Typic Paleaquults	Paleaquults	Aquults	Ultisols.
Gritney	Clayey, mixed, thermic	Typic Hapludults	Hapludults	Udults	Ultisols.
Johns	Fine-loamy over sandy or sandy-skeletal, siliceous, thermic.	Aquic Hapludults	Hapludults	Udults	Ultisols.
Johnston	Coarse-loamy, siliceous, acid, thermic.	Cumulic Humaquepts	Humaquepts	Aquepts	Inceptisols.
Kalmia	Fine-loamy over sandy or sandy skeletal, siliceous, thermic.	Typic Hapludults	Hapludults	Udults	Ultisols.
Leon	Sandy, siliceous, thermic	Aeric Haplaquods	Haplaquods	Aquods	Spodosols.
Lumbee	Fine-loamy over sandy or sandy-skeletal, siliceous, thermic.	Typic Ochraquults	Ochraquults	Aquults	Ultisols.
Lynchburg	Fine-loamy, siliceous, thermic	Aeric Paleaquults	Paleaquults	Aquults	Ultisols.
Lynn Haven	Sandy, siliceous, thermic	Typic Haplaquods	Haplaquods	Aquods	Spodosols.
Marvyn	Fine-loamy, siliceous, thermic	Typic Hapludults	Hapludults	Udults	Ultisols.
Nahunta	Fine-silty, siliceous, thermic	Aeric Paleaquults	Paleaquults	Aquults	Ultisols.
Norfolk	Fine-loamy, siliceous, thermic	Typic Paleudults	Paleudults	Udults	Ultisols.
Orangeburg	Fine-loamy, siliceous, thermic	Typic Paleudults	Paleudults	Udults	Ultisols.
Pamlico	Sandy or sandy-skeletal, siliceous, dysic, thermic.	Terric Medisaprists	Medisaprists	Saprists	Histosols.
Pantego	Fine-loamy, siliceous, thermic	Umbric Paleaquults	Paleaquults	Aquults	Ultisols.
Paxville	Fine-loamy, siliceous, thermic	Typic Umbraquults	Umbraquults	Aquults	Ultisols.
Rains	Fine-loamy, siliceous, thermic	Typic Paleaquults	Paleaquults	Aquults	Ultisols.
Roanoke	Clayey, mixed, thermic	Typic Ochraquults	Ochraquults	Aquults	Ultisols.
Toisnot	Coarse-loamy, siliceous, thermic.	Typic Fragiaquults	Fragiaquults	Aquults	Ultisols.
Tomahawk	Loamy, siliceous, thermic	Arenic Hapludults	Hapludults	Udults	Ultisols.
Torhunta	Coarse-loamy, siliceous, acid, thermic.	Typic Humaquepts	Humaquepts	Aquepts	Inceptisols.
Wagram	Loamy, siliceous, thermic	Arenic Paleudults	Paleudults	Udults	Ultisols.
Woodington	Coarse-loamy, siliceous, thermic.	Typic Paleaquults	Paleaquults	Aquults	Ultisols.

*The adjectives and formative elements in names of subgroups are explained in table 20.

TABLE 20.--ADJECTIVES AND FORMATIVE ELEMENTS IN NAMES OF SUBGROUPS

[For additional information and explanation of the taxonomic categories, see the section "Classification of the Soils" in the text]

Adjectives and formative elements	Connotation (simplified explanation) or meaning
Adjectives in subgroup names:	
Aeric	Browner and better aerated than typic.
Aquic	A soil that is saturated in the lower part at some time of the year unless it has been artificially drained.
Arenic	Sandy eluvial horizons (sand or loamy sand), mostly 20 to 40 inches thick.
Cumulic	An overthickened epipedon rich in humus.
Grossarenic	Sandy eluvial horizons (sand or loamy sand) more than 40 inches thick.
Terric	A mineral substratum in an organic soil.
Typic	Represents the central concept of its great group.
Umbric	A thick, acid, dark surface horizon.
Formative elements:	
First formative element in great group name:	
Fluv	Composed of recent alluvium. If the soil is stratified, the percentage of organic carbon decreases irregularly with depth.
Frag	Presence of a fragipan.
Hapl	Minimal horizonation.
Hum	Presence of considerable humus.
Med	An organic soil that has a mean annual soil temperature of 47 to more than 72 degrees Fahrenheit.
Ochr	A surface horizon that is either light in color or low in organic matter, or both.
Pale	A soil with horizons that have more than normal development.
Quartz	More than 95 percent quartz.
Umbr	A thick, acid, dark surface horizon.
Second formative element in great group name:	
aqu	A very wet soil unless artificially drained.
psamm	Sandy texture (sand or loamy sand) to a depth of 40 inches or more.
sapr	Composed mostly of highly decomposed plant materials.
ud	Moist but not wet; dry for short periods or not at all.

TABLE 20.--ADJECTIVES AND FORMATIVE ELEMENTS IN NAMES OF SUBGROUPS--Continued

Adjectives and formative elements	Connotation (simplified explanation) or meaning
Third formative element in great group name:	
ent (from Entisols)-------	Mineral soils with weak or no pedogenic horizons and in most years no deep, wide cracks.
ept (from Inceptisols)----	Mineral soils with some pedogenic horizons and some weatherable minerals. They have enough moisture to mature a crop in most years and have no horizon of illuvial clay. They are relatively low in either organic matter or base saturation, or both.
ist (from Histosols)------	More than half of upper 32 inches consists of organic matter.
od (from Spodosols)-------	Mineral soils that have a horizon with an illuvial accumulation of amorphous aluminum and organic matter, with or without amorphous iron.
ult (from Ultisols)-------	Mineral soils that have a horizon with an illuvial accumulation of silicate clay, low base saturation, and enough moisture to mature a crop in most years.

Example: The Bibb soil is classified in the subgroup of Typic Fluvaquents (Typic/Fluv/aqu/ent). This very wet mineral soil has little soil development, is made up of recent alluvium, and is typical of its great group.

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