Series 1961, No. 1 Issued: 1963

SOIL SURVEY

Calhoun County South Carolina

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

HOW TO USE THE SOIL SURVEY REPORT

THIS SURVEY of Calhoun County, S. C., will serve several groups of readers. It will help farmers in planning the kind of management that will protect their soils and provide good yields; assist engineers in selecting sites for roads, buildings, ponds, and other structures; aid foresters in managing woodlands; and add to our knowledge of soil science.

Locating soils

Use the index to map sheets at the back of this report to locate areas on the large map. The index is a small map of the county on which numbered rectangles have been drawn to show where each sheet of the large map is located. When the correct sheet of the large map has been found, it will be seen that boundaries of the soils are outlined, and that there is a symbol for each kind of soil. All areas marked with the same symbol are the same kind of soil, wherever they occur on the map. The symbol is inside the area if there is enough room; otherwise, it is outside the area and a pointer shows where the symbol belongs.

Finding information

This report contains sections that will interest different groups of readers, as well as some sections that may be of interest to all.

Farmers and those who work with farmers can learn about the soils in the section "Descriptions of Soils" and then turn to the section "Use and Management of Soils." In this way, they first identify the soils on their farm and then learn how these soils can be managed and what yields can be expected. The "Guide to Mapping Units" at the back of the report will simplify use of the map and report. This guide lists each soil and land type mapped in the county, and the page where each is described. It also lists, for each soil and land type, the capability unit, woodland suitability group, and wildlife suitability group, and the pages where each of these is described.

Foresters and others interested in woodlands can refer to the section "Use of Soils as Woodland." In that section the soils in the county are grouped according to their suitability for trees, and factors affecting the management of woodland are explained.

Engineers and builders will want to refer to the section "Engineering Applications." Tables in that section show characteristics of the soils that affect engineering.

Scientists and others who are interested will find information about how the soils were formed and how they were classified in the section "Formation and Classification of Soils."

Students, teachers, and other users will find information about soils and their management in various parts of the report, depending on their particular interest.

Newcomers in Calhoun County will be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section "Additional Facts About the County."

* * * * *

Fieldwork for this survey was completed in 1961. Unless otherwise indicated, all statements in the report refer to conditions in the county at that time. The soil survey of Calhoun County was made as part of the technical assistance furnished by the Soil Conservation Service to the Calhoun County Soil Conservation District.

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Series 1961, No. 1

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SOIL SURVEY OF CALHOUN COUNTY, SOUTH CAROLINA

Fieldwork by W. C. Camp, Carl B. Lawrence, C. M. Ellerbe, E. C. Moore,
O. L. Dodd, and J. B. Wakefield, Soil Conservation Service

Report by Carl B. Lawrence

UNITED STATES DEPARTMENT OF AGRICULTURE IN COOPERATION WITH THE SOUTH CAROLINA AGRICULTURAL EXPERIMENT STATION

CALHOUN COUNTY is entirely agricultural. Its chief cash crops are cotton, soybeans, and small grains. Corn and hay are grown as feed for livestock. About half of the county is in woods, and forest products are increasing in importance as a secondary source of income.

This county is in the central part of South Carolina (fig. 1). It has a total land area of 377 square miles, or 241,280 acres. St. Matthews is the county seat. In 1960 its population was 2,433; that of the county was 12,256.

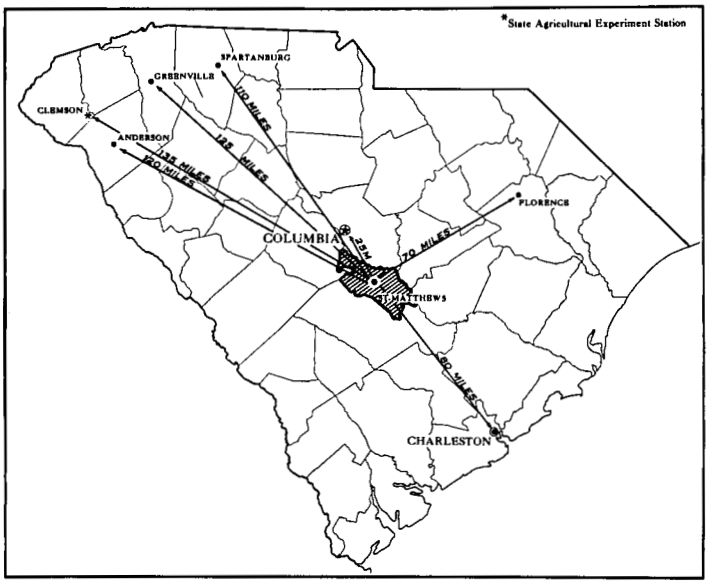

Figure 1.--Location of Calhoun County in South Carolina.

How Soils Are Named, Mapped, and Classified

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

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to uniform procedures. To use this report efficiently, it is necessary to know the kinds of groupings most used in a local soil classification.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Caroline and Magnolia, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in natural characteristics.

Many soil series contain soils that are alike except for texture of their surface layer. According to this difference in texture, separations called soil types are made. Within a series, all the soils having a surface layer of the same texture belong to one soil type. Caroline loamy sand and Caroline sandy clay loam are two soil types in the Caroline series. The difference in texture of their surface layers is apparent from their names.

Some soil types vary so much in slope, degree of erosion, number and size of stones, or some other feature affecting their use, that practical suggestions about their management could not be made if they were shown on the soil map as one unit. Such soil types are divided into soil phases. The name of a soil phase indicates a feature that affects management. For example, Caroline loamy sand, 2 to 6 percent slopes, is one of several phases of Caroline loamy sand, a soil type that ranges from gently sloping to steep.

After a fairly detailed guide for classifying and naming the soils had been worked out, the soil scientists drew soil boundaries on aerial photographs. They used these photos for their base map because they show woodlands, buildings, field borders, trees, and similar detail that greatly help in drawing boundaries accurately. The soil map in the back of this report was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning management of farms and fields, a mapping

unit is nearly equivalent to a soil type or a phase of a soil type. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil type or soil phase.

In preparing some detailed maps, the soil scientist has a problem of delineating areas where different kinds of soils are so intricately mixed, and so small in size, that it is not practical to show them separately on the map. Therefore, he shows this mixture of soils as one mapping unit and calls it a soil complex. Ordinarily, a soil complex is named for the major soil series in it; for example, Plummer-Rutlege loamy fine sands. Also, in most mapping, there are areas to be shown that are so rocky, so shallow, or so frequently worked by wind and water that they cannot be called soils. These areas are shown on a soil map like other mapping units, but they are given descriptive names, such as Borrow pits or Swamp, and are called land types rather than soils.

Only part of the soil survey was done when the soil scientist had named and described the soil series and mapping units, and had shown the location of the mapping units on the soil map. The mass of detailed information he had recorded then needed to be presented in different ways for different groups of users, among them farmers, managers of woodlands, and engineers.

To do this efficiently, he had to consult with persons in other fields of work and jointly prepare with them groupings that would be of practical value to different users. Such groupings are the capability classes, subclasses, and units, designed primarily for those interested in producing the short-lived crops and tame pasture; woodland suitability groups, for those who need to manage wooded tracts; and the classifications used by engineers who build highways or structures to conserve soil and water.

General Soil Map

After a soil scientist studies the soils in a locality and the way they are arranged, he can make a general map that shows several main patterns of soils, called soil associations. Such a map is the colored general soil map in the back of this report. Each association, as a rule, contains a few major soils and several minor soils, in a pattern that is characteristic although not strictly uniform.

The soils within any one association are likely to differ from each other in some or in many properties; for example, slope, depth, stoniness, or natural drainage. Thus, the general soil map shows, not the kind of soil at any particular place, but patterns of soils, in each of which there are several different kinds of soils.

Each soil association is named for the major soil series in it, but as already noted, soils of other series may also be present. The major soils of one soil assiciation may also be present in another association, but in a different pattern.

The general map showing patterns of soils is useful to people who want a general idea of the soils, who want to compare different parts of a county, or who want to know the possible location of good-sized areas suitable for a certain kind of farming or other land use.

1. Lakeland-Vaucluse-Killian soil association: Well-drained to excessively drained soils of the Sandhills

The soils in this soil association are gently sloping to steep and are dissected by many drainageways and by many streams that flow the year round. The soils generally are gently sloping on the narrow ridges, are steep in areas parallel to streams, and are gently sloping between the steep slopes and the streams. The transition from gentle to steep slopes is gradual. The soil association makes up about 28 percent of the county and is mostly wooded. Only a small part is cultivated.

The Lakeland, Vaucluse, and Killian soils are dominant in this soil association (fig. 2, top). The Lakeland soils are on the ridgetops and adjacent slopes. These soils are droughty and excessively drained, and they have a yellowish-brown subsoil. The Vaucluse soils are on the steep, abrupt slopes that parallel the drainageways and smaller streams. They have a yellowish-red, very firm, slightly cemented subsoil. The Killian soils are on the broad, gentle, lower slopes along streams. These soils have a yellowish, heavy clay subsoil and are moderately well drained. Water-bearing strata are fairly near the surface.

The Eustis soils and several land types make up small parts of this association. The Eustis soils, which occur on the slopes, are similar to the Lakeland, but their subsoil is yellowish red instead of yellowish brown. On steep slopes south of Big Beaver Creek is a large acreage of Sandy and clayey land, and adjacent to the streams are narrow areas of Swamp and of Mixed alluvial land.

This soil association consists mainly of privately owned farms. Most of the farms are between 50 and 200 acres in size, but a few are as large as 400 or 500 acres. The association is generally well suited to and mainly used as woodland. The Killian soils are especially well suited to trees. Yields of cultivated crops are low because the soils are susceptible to erosion and have low available moisture capacity. Large areas that were formerly cultivated have grown up in pine.

2. Izagora-Myatt soil association: Well-drained to poorly drained, nearly level soils on stream terraces

The soils in this association are on the nearly level terraces of the Congaree River. The well-drained soils are in pasture, hay, corn, and grain; most areas of the poorly drained soils are wooded. The association makes up about 1 percent of the county and contains only two or three farms, which are livestock farms.

The Izagora and Myatt soils are dominant in the association, and the Kalmia and Okenee also occur (fig. 2, bottom). The poorly drained Myatt soils are most extensive. These soils are on the lower parts of the terraces and require drainage. They have a very dark gray or black surface soil and a mottled,

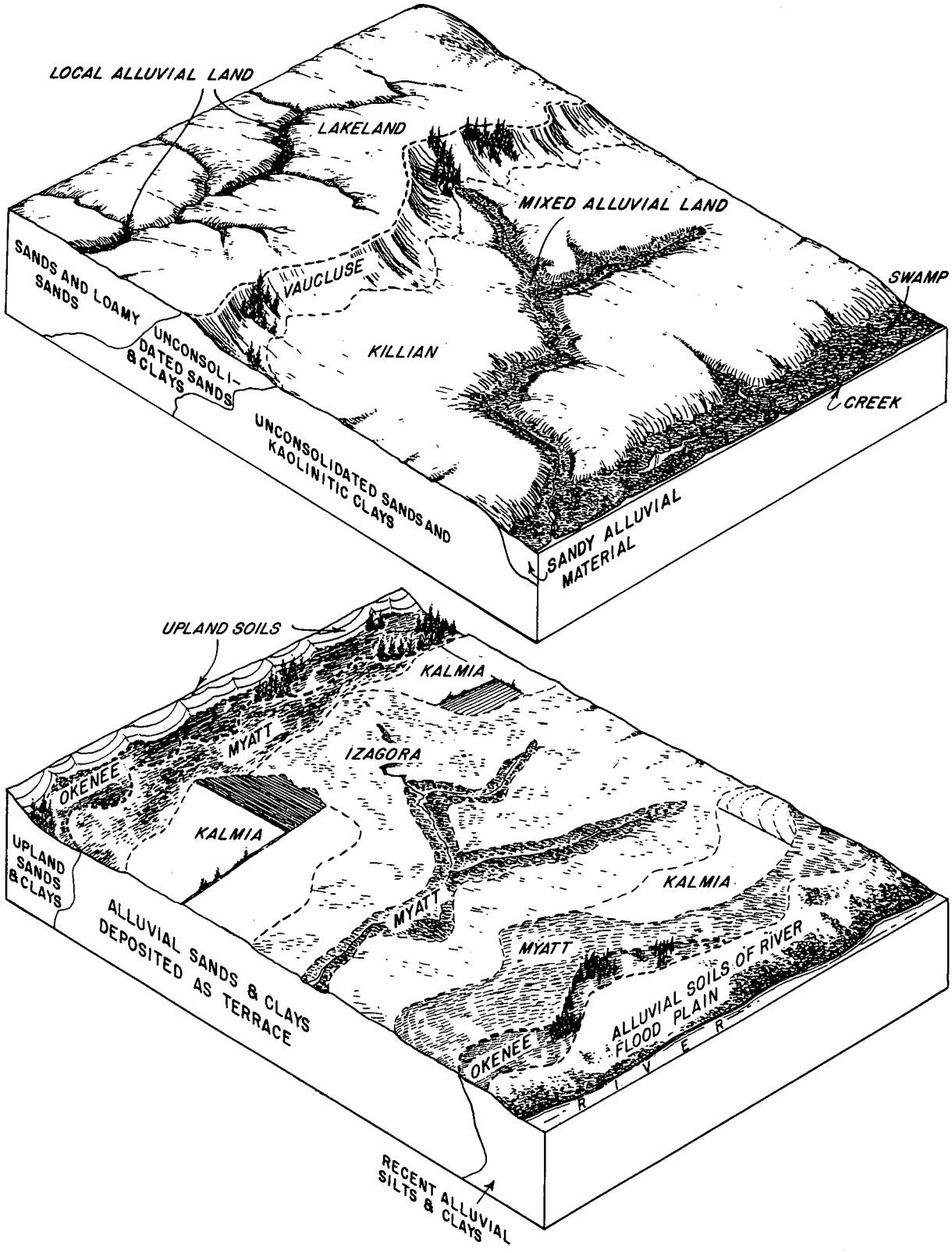

Figure 2.--Top: Major soils in the Lakeland-Vaucluse-Killian soil association and their relationship to the landscape. Bottom: Major soils in the Izagora-Myatt soil association and their relationship to the landscape.

gray subsoil. The somewhat poorly drained Izagora soils are almost as extensive as the Myatt soils and are above them on the terraces. Izagora soils normally do not require drainage, and their acreage in crops and pasture is larger than that of the other soils in the association. Izagora soils have a yellowish subsoil that is mottled with gray.

The well-drained Kalmia soils are the highest soils on the terraces and have a larger proportion of cultivated acreage than have the Izagora soils. The subsoil of Kalmia soils is yellowish brown and uniformly colored. The Okenee soils, which are about equal in acreage to the Kalmia soils, are the lowest soils on terraces. These very poorly drained soils have a thick, black surface layer of organic material and a gray subsoil. They are mostly wooded, but a few acres are pastured and a few are planted to corn.

The farms and other holdings in this soil association are privately owned and generally are between 200 and 500 acres in size. Excess water limits the use of the soils. Drainage is needed on the lower lying, poorly drained soils that are cultivated or are in pasture and hay. Drainage is difficult, however, because there is much ground water and suitable outlets are lacking.

The Izagora and Kalmia soils are well suited to trees. The Myatt and Okenee soils are suited to gum, maple, and other hardwoods and, where sufficiently drained, are suited to pine.

3. Congaree-Chewacla-Wehadkee soil association: Well-drained to poorly drained, nearly level soils of the Congaree River flood plain

The soils in this association lie in a more or less narrow band on the flood plain of the Congaree River. The Congaree, Chewacla, and Wehadkee soils are the main soils and occupy about equal acreages (fig. 3, top). Areas of Swamp are scattered throughout the soil association. The soils in the association formed in similar alluvial material. They are fertile, but they vary in drainage and are likely to be flooded. This association makes up about 4 percent of the county.

Almost all of this association is wooded and is mostly in large, private and commercial holdings. Some of the land is leased to hunting clubs. There are no farmsteads, but livestock and dairy farmers in the adjacent soil associations have cleared some of the better drained areas of Congaree and Chewacla soils and use them for pasture, hay, and corn.

The brown, well-drained Congaree soils are normally adjacent to the Congaree River on the highest part of the flood plain. They are less susceptible to flooding than the other soils and, consequently, are cultivated more. Corn, grain, hay, pasture, and pine trees grow well on these soils.

The Chewacla soils are slightly lower on the plain than the Congaree soils and are more poorly drained and more frequently flooded. They are well suited to pasture and hay. Areas where the water table can be lowered are suited to corn, but planting this crop is risky because floods are likely. Pines and hardwoods are well suited to Chewacla soils, which have a higher available moisture capacity than the other soils in the association.

The poorly drained Wehadkee soils are the lowest soils on the flood plain. They are flooded more frequently than the higher soils and are limited in use by a high water table. The areas of Swamp are generally very poorly drained; water may stand on the surface. Swamp is generally best used for cypress timber and wildlife habitats, but the use varies.

4. Norfolk-Ruston-Lakeland soil association: Gently sloping to strongly sloping soils of the middle Coastal Plain

The soils in this association are on rolling uplands that consist of broad, gently sloping ridges and slopes that become steeper and narrower near the streams. The streams have cut into the soils and have formed a dendritic pattern. The soil association makes up about 33 percent of the county and is mostly in general farms. Cotton and soybeans grow well and are the chief cash crops. On most farms the steeper and more sandy soils are wooded. Most farms are between 50 and 200 acres in size, but many are between 300 and 500 acres.

The Norfolk, Ruston, and Lakeland soils are dominant in the association, but small acreages of Faceville, Vaucluse, Caroline, and Grady soils also occur (fig. 3, bottom). All these soils have a gray surface layer. Adjacent to many of the small streams are small, narrow areas of Mixed alluvial land.

In most places the Ruston and the Norfolk soils have a thick surface layer. The well-drained Norfolk soils have a yellowish-brown subsoil and generally are on the top of the ridges, though in places they extend part way down the side slopes. The Ruston soils are well drained, have a brown or yellowish-red subsoil, and, in most places, are on the upper and lower parts of side slopes. The Lakeland soils have a coarse, sandy texture and are excessively drained. Although they occur on the ridgetops and side slopes, they are generally close to the drainageways.

The well-drained Faceville soils are generally near the Ruston soils but have a finer texture. The well-drained Vaucluse soils are on sharp, abrupt breaks and knolls, and the well-drained Caroline soils are in narrow, steep areas along the streams. The poorly drained Grady soils are in small, elliptical depressions.

The sloping soils, especially those that have a fine-textured subsoil, are susceptible to moderate erosion and need erosion control practices if they are to be cropped continuously. The steeper, more severely eroded areas are best suited to permanent vegetation. Because the Lakeland and other coarse-textured soils have a low available moisture capacity, their use for general crops is limited. Such soils are suited to deep-rooted perennials and trees, and many areas have been planted to trees in recent years. The Grady soils, which occur in depressions throughout the association, must be drained if they are to be used for cultivated crops.

5. Magnolia-Faceville-Ruston soil association: Gently sloping to strongly sloping, red soils of the upper Coastal Plain

Most of this soil association is in the higher parts of the county. The soils in the association are on

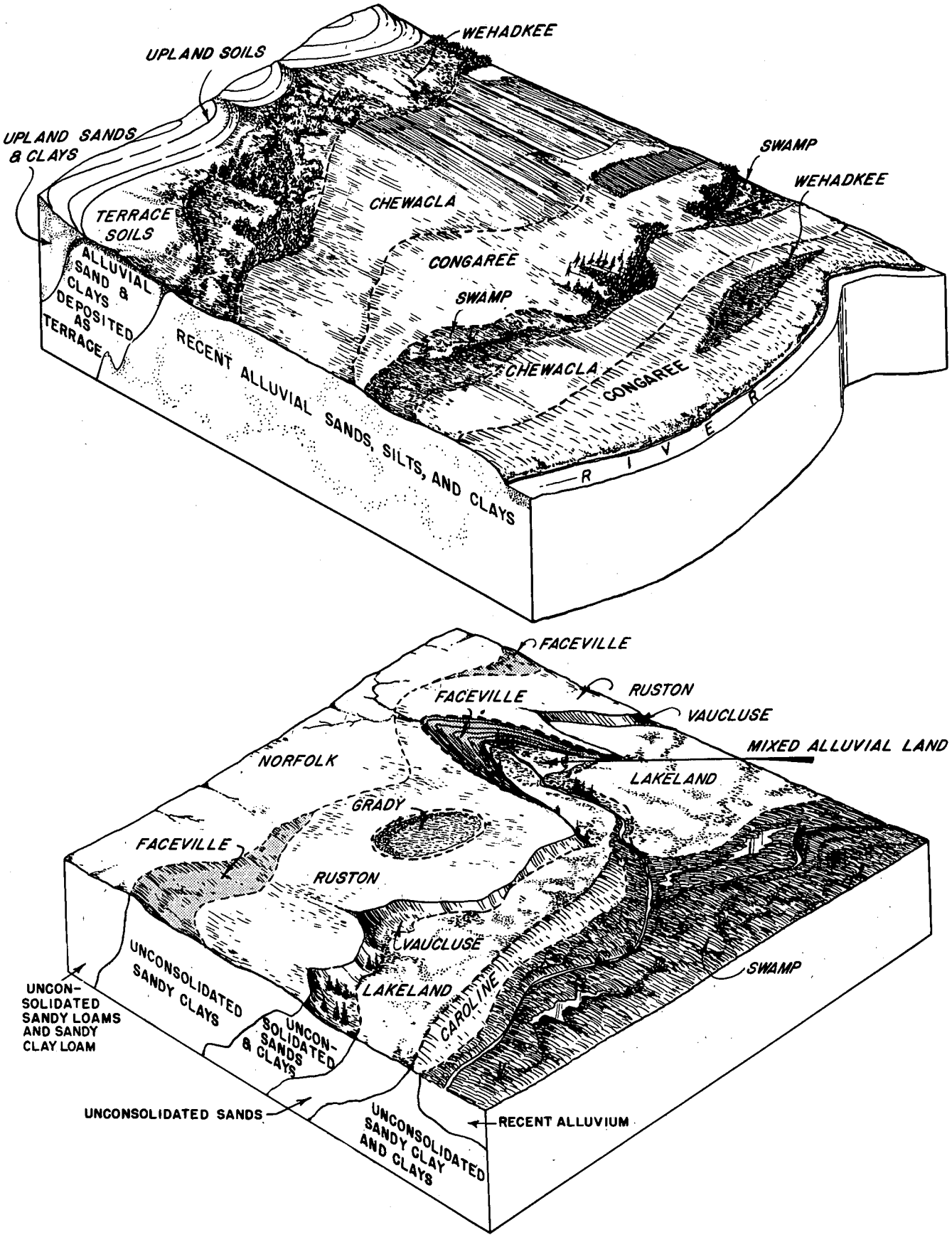

Figure 3.--Top: Major soils in the Congaree-Chewacla-Wehadkee soil association and their relationship to the landscape. Bottom: Major soils in the Norfolk-Ruston-Lakeland soil association and their relationship to the landscape.

ridgetops and their side slopes. The ridgetops are generally broad and nearly level. In most places gentle slopes extend from the ridgetops to steep slopes near the streams, but in some places nearly level or gently sloping ridges break off rather abruptly to steep side slopes. The streams in this soil association flow intermittently much of the year and empty into the Congaree River or its tributaries. The depth to the water table is greater in this association than elsewhere in the county. This soil association amounts to about 25 percent of the county.

Most farms are between 300 and 400 acres in size, though several are larger. Most of them are row-crop farms, but there are also many livestock farms and several poultry farms. Practically all of the association is cultivated, mainly to cotton, soybeans, and small grains, and there is a much smaller acreage of pasture and hay. Trees grow on some steep slopes along the drainageways, but these wooded areas occupy only a small part of the association.

Dominant in this soil association are the Magnolia, Faceville, and Ruston soils, but Orangeburg, Greenville, Caroline, Marlboro, and Grady soils make up large parts (fig. 4, top). The Magnolia soils are red, deep, well drained, and fine textured. They are similar to the Greenville soils and occur with them in the higher parts of this association. Slightly lower are the well-drained Faceville soils, which have a fine-textured, yellowish-red subsoil. The Ruston soils are deep, well drained, and coarse textured. They are generally on the side slopes and are somewhat below the Faceville soils.

The Orangeburg soils are similar to the Ruston, but their subsoil is red instead of yellowish red. The Caroline soils, which are low on the slopes and on slope breaks along some of the streams, have a yellowish-red, heavy clay subsoil. The acreage in Marlboro soils is small. The poorly drained Grady soils occur in oval-shaped depressions that are locally called Caroline Bays and are scattered throughout the area.

The sloping soils of this soil association are susceptible to moderate erosion, and the steeper soils, to severe erosion. Because the surface layer of the Magnolia, Greenville, and Faceville soils is normally not so thick as that of many other soils in the county, the sandy clay subsoil is exposed more readily by erosion unless it is controlled. The soils in this association respond to heavy fertilization, retain moisture well, and are generally well suited to intensive cultivation. Only the poorly drained Grady soils need drainage.

6. Goldsboro-Lynchburg soil association: Nearly level to gently sloping soils of the lower Coastal Plain

This soil association consists mainly of moderately well drained and somewhat poorly drained soils on nearly level to gentle slopes (fig. 5). Many small and large areas of wet, poorly drained soils also occur and have no natural outlets for drainage. Excess water is the main problem of management, and farmers have provided extensive ditching. Few streams are in the association, and the water table is near the surface. This association amounts to about 9 percent of the county.

The farms are between 100 and 200 acres in size and are largely owned and operated by the farmers who live on them. About 25 percent of the association is wooded, and there are many good stands of pine. The woods provide good hunting, especially for game birds. Most of the cleared acreage is used for crops, principally cotton, corn, soybeans, small grains, and some truck crops. Improved highways greatly facilitate farm-to-market transportation.

The Goldsboro and Lynchburg are the main soils, but also present are Norfolk, Rains, Portsmouth, and Coxville soils (fig. 4, bottom). The surface layer of the wet soils ranges from gray to almost black. In all the soils the subsoil is dominantly sandy clay loam. The moderately well drained Goldsboro soils occupy most of the higher parts in the soil association. The well-drained Norfolk soils are less extensive than the Goldsboro and are above them on the slopes. The Goldsboro and Norfolk soils have a yellowish-brown subsoil and produce high yields.

The Lynchburg soils are the most extensive and are generally in large, flat areas. They are somewhat poorly drained and have a dark surface layer. The Rains and Portsmouth soils are in small, irregular, oval depressions and are poorly drained and very poorly drained. They have a very dark surface layer and a gray subsoil. The poorly drained Coxville soils occur in small depressions and on large flats. They have a dark-gray surface layer and a clay subsoil.

The soils in this association are generally suited to intensive cropping. They have adequate available moisture and respond well to mechanized management and heavy fertilization. The Goldsboro and Norfolk soils do not require drainage or protection against erosion. Drainage, however, must be provided in cultivated areas of the Lynchburg, Rains, Portsmouth, and Coxville soils (fig. 6). These soils yield well if they are drained. Pine grows especially well on the Lynchburg soils, even without drainage, but drainage improves the growth of trees on the Rains, Portsmouth, and Coxville soils.

Use and Management of Soils

This section discusses the use and management of soils for agriculture, as woodland, in engineering works, and for wildlife.

Management of Soils for Agriculture

This subsection can be used as a general guide for managing the soils of the county. For detailed information, farmers can consult members of the local staff of the Soil Conservation Service, the South Carolina Extension Service, or the Agricultural Experiment Station at Clemson.

The subsection has four main parts. The first part discusses some general principles of management. The second part explains capability grouping.

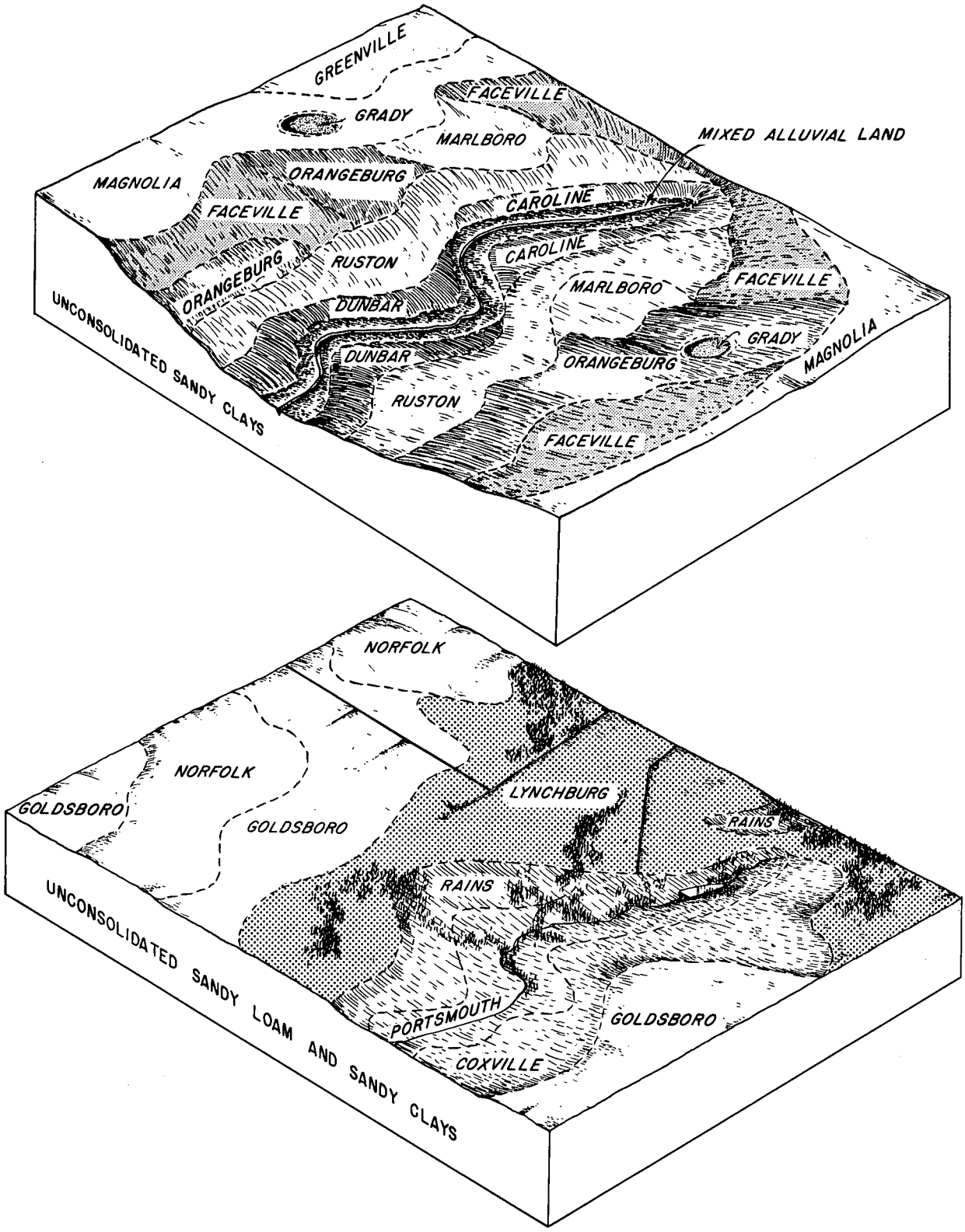

Figure 4.--Top: Major soils of the Magnolia-Faceville-Ruston soil association and their relationship to the landscape. Bottom: Major soils of the Goldsboro-Lynchburg soil association and their relationship to the landscape.

Figure 5.--Nearly level soil in Goldsboro-Lynchburg soil association.

Figure 6.--Drainage ditch on Lynchburg, Rains, Portsmouth, and Coxville soils in Goldsboro-Lynchburg soil association.

In the third part, the soils of the county are placed in capability units and the use and management of these units are explained. The fourth part consists of tables that list estimated yields of the principal crops at two levels of management and the suitability of the soils for named crops.

Principles of soil management

Most soils require similar broad, or general, practices of management to produce satisfactory yields. These broad practices are discussed in the following pages, but before they can be carried out, several special needs of the soils must first be determined. Many of these special needs are pointed out in the description of the soils and in the subsection that describes capability units. Local representatives of the Soil Conservation Service or of the South Carolina Extension Service can help interpret these special soil needs in terms of soil management practices.

Estimating fertilizer needs.--All cropland in this county requires additions of fertilizer. A knowledge of the plant nutrients that a soil can supply naturally helps in estimating the need for fertilizer. The farmer should also know how a field has been managed, and he should decide the yield level that he wishes to maintain. Also helpful is knowing the results of chemical tests and of growth tests on experimental plots. Because soils differ, some parts of a field may need more lime or fertilizer than other parts. The soil map and soil tests show differences in soils and help the farmer to determine the kinds and amounts of fertilizer needed.

The yield level that the farmer wishes to maintain has much to do with the amount of fertilizer applied. The cost of fertilization and the current market must also be considered. If crops are removed from a field year after year and the soil is leached of lime and nutrients, the field cannot continue to produce satisfactory yields unless lime and fertilizer are added in adequate amounts.

Supplying organic matter and nitrogen.--Most of the soils in Calhoun County are deficient in organic matter and nitrogen. If nitrogen is added to crops other than legumes, it increases yields and the organic matter that can be returned to the soil. Additional organic matter improves the available moisture capacity and tilth and helps to reduce erosion.

Nitrogen is supplied to the soil in a different way than are phosphate, potash, and other soil minerals. Most nitrogen is obtained from plant remains, especially those of legumes, and from animal manure or commercial fertilizer. The amount of nitrogen thus added depends largely on the kinds of crops grown.

At the time of seeding a small grain or another nonlegume, it is good practice to apply a fertilizer that contains nitrogen, phosphate, and potash. Later, additional nitrogen can be applied as a top dressing or side dressing. The needs of legumes are generally met by applying at seeding time a fertilizer containing phosphate and potash.

Selecting a good cropping system.--A cropping system should be selected that supplies fresh organic matter to crops that need it most. If cover crops and crop residue, especially that from legumes, are plowed under, yields of the succeeding crops are increased. Good cropping systems help to control erosion, soil-borne diseases, and weeds. The additional organic matter gained through a good cropping system absorbs plant nutrients and releases them to crops over a long period of time. Without the organic material, fertilizer, especially nitrogen, leaches out if not quickly taken up by a growing crop.

A cropping system suitable for most soils in Calhoun County is a small grain and lespedeza for 2 years followed by 1 year of cotton or corn.

Another good system provides 2 or 3 years of bahiagrass followed by 2 years of a row crop.

Controlling erosion.--Because most soils in Calhoun County have been damaged by sheet erosion and some are severely eroded and have shallow gullies, improved use and management are needed to help control erosion. The steeper areas generally should be kept in forest or pasture. The sloping areas can be protected if cropping systems are long enough and plants cover the soil most of the time. One of the best ways to lessen erosion is to manage the soil well and to raise fertility to a high level. An increased number of plants increases the organic matter and thus improves soil structure. Practices of erosion control that may be needed are contour stripcropping, contour tillage, terracing, and sodding drainageways.

Artificial drainage.--Many wet areas in the county need to be studied to determine if drainage is practical. If their soil drainage is improved, most somewhat poorly drained and poorly drained soils provide good grazing and good crop yields. Wet soils that cannot be drained by tile are not so good for crops as are soils that are permeable to water and roots. The wet soils are cold and are waterlogged in wet periods; they bake and are hard in dry periods. In wet areas, it is best to plant crops that are tolerant of wetness.

Tillage.--Soils must be in good tilth if they are to produce maximum yields, but tillage often breaks down the structure of a soil. Adding organic matter and growing sod-forming crops help to restore soil structure. Tillage implements are helpful in maintaining good tilth if they mix a large amount of organic matter into the surface layer, but overcultivation should be avoided. Some soils in the county puddle unless they are cultivated within only a narrow range of moisture content. Soils that have a naturally sandy surface layer are much easier to maintain and improve in tilth than are those that have a subsoil exposed by erosion. Tilling sloping soils on the contour helps to maintain good tilth by reducing runoff and erosion.

Capability groups of soils

The capability classification is a grouping of soils that shows, in a general way, how suitable soils are for most kinds of farming. It is a practical grouping based on limitations of the soils, on the risk of damage when they are used, and on the way they respond to management.

In this system all the kinds of soil are grouped at three levels, the capability class, subclass, and unit. Eight capability classes are in the broadest grouping and are designated by Roman numerals I through VIII. In class I are the soils that have few limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other seven classes have progressively greater natural limitations. In class VIII are soils and landforms so rough, shallow, or otherwise limited that, without major reclamation, they do not produce worthwhile yields of crops, forage, or wood products.

The subclasses indicate major kinds of limitations within the classes. Within most of the classes there can be as many as four subclasses. The subclass is indicated by adding a small letter, e, w, s, or c, to the class numeral, for example, IIe. The letter e shows that the main limitation is risk of erosion unless a close-growing plant cover is maintained; w means that water in or on the soil will interfere with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); s shows that the soil is limited mainly because it is shallow, droughty, or stony; and c, used in only some parts of the country, indicates that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few or no limitations. Class V can contain, at the most, only subclasses w, s, and c because the soils in it have little or no susceptibility to erosion but have other limitations that limit their use largely to pasture, range, woodland, or wildlife.

Within the subclasses are the capability units, which are groups of soils enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally identified by numbers assigned locally, for example, IIe-1 or IIIe-2. These numbers are not consecutive in Calhoun County, because not all of the capability units used in South Carolina occur in this county. The soils in each capability unit have about the same limitations and require about the same treatment.

Soils are classified in capability classes, subclasses, and units in accordance with the degree and kind of their permanent limitations; but without consideration of major and generally expensive landforming that would change the slope, depth, or other characteristics of the soil; and without consideration of possible but unlikely major reclamation projects.

The eight classes in the capability system, and the subclasses and units in this county, are described in the list that follows.

Class I. Soils that have few limitations that restrict their use.

Capability unit I-1.--Deep, well-drained, nearly level soils that have a loamy sand surface layer, 10 to 18 inches thick, and a friable sandy clay loam to sandy loam subsoil.

Capability unit I-2.--Deep, well-drained, nearly level soils that have a surface layer 6 to 12 inches thick and a slightly sticky, friable fine sandy clay to clay loam subsoil.

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

Subclass IIe. Soils that are likely to erode if they are not protected.

Capability unit IIe-1.--Deep, well-drained, gently sloping soils that are slightly or moderately eroded and have a friable subsoil.

Capability unit IIe-2.--Deep, well-drained, gently sloping soils that are slightly to moderately eroded and have a slightly sticky, friable fine sandy clay to clay loam subsoil.

Capability unit IIe-3.--Deep, well-drained, gently sloping soils that are slightly or moderately eroded and have a firm, slightly plastic subsoil.

Capability unit IIe-4.--Moderately deep to deep, well-drained to somewhat poorly drained soils that are slightly susceptible to erosion and have a surface layer 10 to 30 inches thick and a compact or slightly cemented subsoil.

Subclass IIw. Soils that have moderate limitations because of excess water.

Capability unit IIw-1.--Moderately deep to deep, nearly level, slightly wet alluvial land in draws and depressions.

Capability unit IIw-2.--Deep, moderately well drained or somewhat poorly drained, nearly level soils.

Capability unit IIw-4.--Deep, well-drained, nearly level soils on flood plains that are occasionally flooded.

Subclass IIs. Soils that have moderate limitations because of low available moisture capacity.

Capability unit IIs-1.--Deep, well-drained, nearly level and gently sloping soils that have a rapidly permeable surface layer, 18 to 30 inches thick, and a friable subsoil.

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

Subclass IIIe. Soils that are subject to severe erosion if they are cultivated and are not protected.

Capability unit IIIe-1.--Deep to moderately deep, well-drained, sloping soils that are slightly to moderately subject to erosion and have a friable subsoil.

Capability unit IIIe-2.--Deep, well-drained, gently sloping and sloping soils that are slightly to severely susceptible to erosion and have a sticky, friable, fine-textured subsoil.

Capability unit IIIe-3.--Deep, well-drained, sloping soils that are slightly or moderately subject to erosion and have a firm, slightly plastic, slowly permeable subsoil.

Capability unit IIIe-4.--Moderately deep to deep, gently sloping and sloping soils that are slightly or moderately eroded and have a rapidly permeable surface layer, generally 10 to 30 inches thick, and a compact or slightly cemented, slowly permeable subsoil.

Capability unit IIIe-5.--Deep, somewhat droughty, sloping soils that are moderately subject to erosion and have a permeable, sandy surface layer, 18 to 30 inches thick, and a friable, permeable subsoil.

Subclass IIIw. Soils that are severely limited because of excess water.

Capability unit IIIw-2.--Deep, poorly drained, nearly level soils with a firm, slowly permeable sandy clay or clay subsoil.

Capability unit IIIw-3.--Moderately deep, nearly level, somewhat poorly drained soils on flood plains that are subject to flooding.

Capability unit IIIw-4.--Deep, nearly level, very poorly drained soils with a black, organic surface layer and a sandy loam to sandy clay loam subsoil.

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

Capability unit IIIs-1.--Deep, nearly level and gently sloping, excessively drained sands and loamy sand with a surface layer 30 to 42 inches thick.

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

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

Capability unit IVe-1.--Deep, strongly sloping, moderately eroded soils and sloping, severely eroded soils with rapid runoff and a sticky, friable subsoil.

Capability unit IVe-3.--Deep, strongly sloping, slightly or moderately eroded soils with a firm, slightly plastic, slowly permeable subsoil.

Capability unit IVe-4.--Moderately deep, strongly sloping, slightly eroded soils and sloping, moderately eroded soils with a compact or slightly cemented subsoil.

Capability unit IVe-5.--Strongly sloping, slightly droughty soil with a loamy sand surface layer, 18 to 30 inches thick.

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

Capability unit IVw-1.--Nearly level, poorly drained or somewhat poorly drained soils on flood plains that are frequently flooded.

Capability unit IVw-3.--Nearly level, poorly drained soils with a sandy clay loam to sandy clay subsoil and a high water table.

Capability unit IVw-4.--Generally poorly drained, alluvial land that is subject to frequent flooding and has variable texture and a high water table.

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

Capability unit IVs-1.--Deep, coarse-textured, excessively drained, gently sloping and sloping soils.

Class V. Soils not likely to erode that have other limitations, impractical to remove without major reclamation, that limit their use largely to pasture or range, woodland, or wildlife food and cover.

Subclass Vw. Soils that are too wet for cultivation and cannot be feasibly drained or protected.

Capability unit Vw-2.--Poorly drained or very poorly drained, coarse-textured, unproductive soils.

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

Subclass VIe. Soils severely limited, chiefly by risk of erosion if protective cover is not maintained.

Capability unit VIe-1.--Deep, strongly sloping, severely eroded soils with a sticky, sandy clay subsoil.

Capability unit VIe-2.--Sloping, severely eroded soils and strongly sloping, eroded soils with a compact or slightly cemented subsoil.

Subclass VIs. Soils generally unsuitable for cultivation and limited for other uses by their low available moisture capacity.

Capability unit VIs-1.--Deep, strongly sloping, excessively drained soils that are coarse textured, droughty, and unproductive.

Class VII. Soils that have very severe limitations that make them unsuitable for cultivation without major reclamation, and that restrict their use largely to grazing, woodland, or wildlife.

Subclass VIIe. Soils very severely limited, chiefly by risk of erosion if protective cover is not maintained.

Capability unit VIIe-2.--Steep, eroded soils and sloping and moderately steep, sandy and clayey land.

Subclass VIIw. Soils very severely limited by excess water.

Capability unit VIIw-1.--Swamp on nearly level stream bottoms.

Subclass VIIs. Soils very severely limited by low available moisture.

Capability unit VIIs-1.--Strongly sloping, excessively drained, coarse-textured soils with very low available moisture capacity and low fertility.

Capability unit VIIs-2.--Borrow pits.

Class VIII. Soils and landforms that have limitations that preclude their use, without major reclamation, for commercial production of plants and that restrict their use to recreation, wildlife, water supply, or esthetic purposes. No soils in Calhoun County are in class VIII.

Capability units in Calhoun County

In this subsection each capability unit is described and the soils in it are listed. Suggestions are given on how to use and manage the soils in each unit. As stated in the explanation of capability grouping, a capability unit consists of soils that are suited to the same crops, require similar management, and produce about the same yields.

CAPABILITY UNIT I-1

In this capability unit are deep, well-drained, friable soils on nearly level uplands. The loose loamy sand surface layer is generally 10 to 12 inches thick, but it is as much as 18 inches thick in some places. The subsoil, in most places, is friable sandy clay loam, but this layer ranges from sandy clay loam to sandy loam. The soils are--

Norfolk loamy sand, 0 to 2 percent slopes.
Orangeburg loamy sand, 0 to 2 percent slopes.

Infiltration of water into these soils is moderately rapid, permeability is moderate, and the available moisture capacity is medium but is sufficient for most crops. Runoff is very slow, and there is no erosion hazard. These soils contain little organic matter, are medium to high in fertility, and are medium acid.

The soils in this group are among the best in the county for farming. They make up about 5 percent of the county, and nearly all of their acreage is cultivated. Only a small part is in pasture or woods. These soils are suited to many kinds of crops and are used chiefly for cotton, corn, small grains, and soybeans. Bahiagrass and Coastal bermudagrass are some of the better suited grasses for hay and pasture, and sericea lespedeza is one of the better suited legumes for permanent hay or for pasture.

These soils have a thick root zone, are easy to till, and can be worked within a wide range of moisture content. They respond well to fertilizer. Because these soils are nearly level and friable, modern farm machinery is easy to use. Winds early in spring cause considerable soil blowing where the soils are exposed, dry, and freshly plowed. Stripcropping is an effective means of controlling the loss of soil (fig. 7).

Row crops may be grown every year, and fertility may be maintained by applying large amounts of commercial fertilizer, which increases yields and crop residue. If crop residue and cover crops are turned under, organic matter is increased and good tilth maintained. Legumes and some other crops respond to added lime.

CAPABILITY UNIT I-2

This capability unit consists of deep, well-drained, friable soils of the nearly level uplands. These soils generally have a fine sandy loam to loamy fine sand surface layer that ranges from 6 to 12 inches in thickness. Their subsoil is slightly sticky

Figure 7.--Oats planted in strips to protect a young stand of cotton from soil blowing. Capability class I.

and ranges from fine sandy clay to clay loam. The soils are--

Faceville loamy fine sand, 0 to 2 percent slopes.
Faceville and Ruston soils, 0 to 2 percent slopes.
Greenville sandy loam, 0 to 2 percent slopes.
Magnolia sandy loam, 0 to 2 percent slopes.
Marlboro fine sandy loam, 0 to 2 percent slopes.

Infiltration of water into these soils is moderate. Permeability is moderate, and though ample for most crops, the available moisture capacity is medium. The soils are generally high in fertility, are medium in organic-matter content, and are medium acid. Plant nutrients are retained well.

These soils are important agriculturally and make up about 2 percent of the county. Practically all of the acreage is cultivated intensively. The soils produce high yields and are suited to many kinds of crops, though they are now used chiefly for cotton, soybeans, corn, and small grains. They are well suited to Coastal bermudagrass and bahiagrass, but only a small acreage is pastured.

The soils in this group have a thick root zone and are generally in good tilth, but they cannot be worked soon after rains, because their subsoil is fine textured and sticky. Little water runs off these nearly level soils, and erosion is not a hazard. The use of farm machines is practical.

Row crops may be grown on these soils every year if fertility is maintained by applying large amounts of fertilizer. Increased fertility increases yields and crop residue. If crop residue and cover crops are turned under, organic matter is increased and good tilth is maintained. Liming in amounts indicated by field tests is needed for crops with a high lime requirement.

CAPABILITY UNIT IIe-1

In this capability unit are deep, well-drained, friable soils on gently sloping uplands. The surface layer is loose loamy sand, commonly more than 8 inches thick. According to the amount of erosion, however, the surface layer ranges from 4 to 13 inches in thickness. The subsoil, in most places, is friable sandy clay loam, but it ranges from sandy clay loam to sandy loam. The soils are--

Norfolk loamy sand, 2 to 6 percent slopes.
Norfolk loamy sand, 2 to 6 percent slopes, eroded.
Norfolk loamy sand, thin solum, 2 to 6 percent slopes.
Norfolk loamy sand, thin solum, 2 to 6 percent slopes, eroded.
Orangeburg loamy sand, 2 to 6 percent slopes.
Orangeburg loamy sand, 2 to 6 percent slopes, eroded.

Infiltration of water into these soils is moderately rapid, permeability is moderate, and the available moisture capacity is medium but is sufficient for most crops. Runoff causes a slight to moderate hazard of erosion. These soils contain little organic matter, are medium to high in fertility, and are medium acid to strongly acid.

This group is made up of the most productive soils in the county and accounts for about 5 percent of the land area. Nearly all of the acreage is cultivated; a small part is in pasture or in woods. The soils are suited to many kinds of crops but are now used chiefly for cotton, corn, small grains, and soybeans. For permanent hay or pasture, bahiagrass and Coastal bermudagrass are among the better suited grasses, and sericea lespedeza is one of the better legumes.

These soils have a thick root zone, are easy to till, and can be worked within a wide range of moisture content. The gentle, smooth slopes and friable nature of the soils encourage the use of modern farm machines. Winds early in spring, however, cause considerable soil blowing where the soils are exposed, dry, and freshly plowed.

Water erosion, though not severe, may be a hazard on these soils if they are cultivated. Because they are mostly in large areas on long, smooth, gentle slopes, these soils generally are well suited to parallel terracing and to stripcropping. Contour tilling, sodding of waterways, and similar practices are effective in erosion control.

Also effective in erosion control is keeping close-growing crops on the soils 2 years out of every 4. A suitable cropping system consists of 1 or 2 years of a small grain, of lespedeza, or of some other close-growing crop, and then 1 or 2 years of row crops. Large applications of a complete fertilizer increase the yields of crops, and larger yields leave more residue. Turning under the crop residue and cover crops helps to increase organic matter and thereby helps to control erosion and to maintain good tilth. Sericea lespedeza, annual lespedeza, and other legumes respond to additions of lime.

CAPABILITY UNIT IIe-2

This capability unit consists of deep, well-drained, friable soils on gently sloping uplands. These soils are slightly to moderately eroded. They generally have a loamy fine sand, sandy loam, or fine sandy loam surface layer that ranges from 6 to 12 inches in thickness. Their subsoil is slightly sticky fine sandy clay to clay loam. The soils are--

Faceville loamy fine sand, 2 to 6 percent slopes.
Faceville loamy fine sand, 2 to 6 percent slopes, eroded.
Faceville and Ruston soils, 2 to 6 percent slopes.
Faceville and Ruston soils, 2 to 6 percent slopes, eroded.
Greenville sandy loam, 2 to 6 percent slopes.
Greenville sandy loam, 2 to 6 percent slopes, eroded.
Magnolia sandy loam, 2 to 6 percent slopes.
Magnolia sandy loam, 2 to 6 percent slopes, eroded.
Marlboro fine sandy loam, 2 to 6 percent slopes.
Tifton sandy loam, 2 to 6 percent slopes.

These soils have moderate infiltration and permeability. The available moisture capacity is medium but is ample for crops. The soils are generally high in fertility and retain plant nutrients well. They are

medium in content of organic matter and are medium acid. Because runoff is medium, the erosion hazard is slight to moderate.

This group consists of some of the most productive soils in the county and makes up about 8 percent of the land area. Nearly all the acreage is cultivated; only a very small part is in pasture or woods. The principal crops are cotton, soybeans, small grains, and corn, but many other crops are suited. Bahiagrass and Coastal bermudagrass are among the better suited grasses for hay and pasture.

These soils have a thick root zone, are generally in good tilth, and can be worked within a fairly wide range of moisture content, though not soon after rains. Because the soils are on gentle, smooth slopes and are friable, modern farm machines can be used.

Erosion, though moderate, is a hazard if these soils are cultivated. It can be controlled, however, by contour tillage (fig. 8), by maintaining grass or similar protective growth in waterways, and by other practices. Since these soils are mostly in large areas on long, smooth, gentle slopes, they are suitable for parallel terracing and stripcropping. The stripcropping is also effective in reducing soil blowing. Keeping these soils in close-growing crops at least half of the time helps to control erosion and to increase yields. Applying large amounts of a complete fertilizer also increases yields and, consequently, crop residue. The residue should be turned under to add organic matter to the soil and thus to maintain good tilth. Legumes respond to liming. A suitable cropping system consists of a small grain and soybeans for 1 year and row crops for 1 year, or an adapted grass for 2 years and row crops for 2 years.

CAPABILITY UNIT IIe-3

The soils in this capability unit are on gently sloping uplands and are deep, well drained, and yellowish red. Their surface layer is grayish-brown, loose loamy sand, generally 6 to 12 inches thick, and their subsoil is red to yellowish-red sandy clay or clay with firm, blocky structure. The soils in this group are--

Caroline loamy sand, 2 to 6 percent slopes.
Caroline loamy sand, 2 to 6 percent slopes, eroded.

These soils have moderate infiltration into the loamy sand surface layer and slow permeability in the subsoil. These characteristics, in addition to medium runoff on the gentle slopes, cause a moderate erosion hazard when the soils are cultivated. These soils are medium in available moisture capacity, are medium in fertility, are strongly acid, and are low to medium in organic matter.

These soils are not productive, but they make up only about 1/2 of 1 percent of the county. About half of their acreage is cultivated or in pasture, and half is woodland. Cotton, corn, soybeans, small grains, and nearly all other crops common in the county are grown on these soils. Yields are lower than those on soils in capability units IIe-1 and IIe-2, and the response to fertilization is less. These soils are suited to bahiagrass and Coastal bermudagrass for pasture and to sericea lespedeza for permanent hay or for pasture. They generally are not well suited to corn and other crops that require a large amount of moisture in summer.

Contour tillage and waterways protected by growing plants are needed to control erosion but are somewhat difficult to establish because the soils have uneven slopes. A suitable cropping system should include close-growing crops half the time, or 2 years out of every 4. One such system is 2 years of a small grain followed by soybeans or, preferably, lespedeza and 2 years of row crops. To increase organic matter and to retain the plant nutrients provided in fertilizer, all crop residue should be plowed under.

CAPABILITY UNIT IIe-4

In this capability unit are moderately deep to deep, gently sloping soils that are well drained to somewhat poorly drained. Their surface layer is gray to grayish-brown, loose loamy sand that ranges from 10 to 30 inches in thickness. The subsoil is generally compact or slightly cemented sandy clay and clay. The soils are--

Caroline loamy sand, thick surface, 2 to 6 percent slopes.
Killian loamy sand, 2 to 6 percent slopes.
Killian loamy sand, thick surface, 2 to 6 percent slopes.
Vaucluse loamy sand, 2 to 6 percent slopes.
Vaucluse loamy sand, thick surface, 2 to 6 percent slopes.

Water infiltrates rapidly into the coarse-textured surface layer, which has rapid permeability but low available moisture capacity. The subsoil is slowly permeable and retards the movement of water and air. Surface runoff is medium. Because of these characteristics, the water on and in the surface layer after rains is frequently excessive and causes slight to moderate erosion and the loss

Figure 8.--Contour tillage helps control erosion on class II soils.

of plant nutrients. Especially where the surface layer is thicker than 18 inches, these soils are slightly droughty at times and do not supply enough water for shallow-rooted crops.

The soils in this group amount to about 2 percent of the land area in the county. Less than half their acreage is cultivated or pastured, and almost half is wooded. Cotton, soybeans, and oats are best suited to these soils. Bahiagrass and Coastal bermudagrass are the most suitable grasses for pasture and hay, but sericea lespedeza and crimson clover are also grown. Yields are lower on these soils than on the soils of capability units IIe-1 and IIe-2, even with similar fertilization and management.

These soils have a moderately thick root zone and are easy to till, but they cannot be worked soon after heavy rains. Erosion is a hazard that can be held in check by contour tillage and by protecting waterways with growing plants. The use of close-growing crops in the cropping system at least half the time also helps to control erosion and to supply organic matter. Suitable cropping systems provide 2 or more years of sericea lespedeza or bahiagrass and 2 years of row crops, or 1 year of oats and soybeans or crotalaria followed by 1 year of row crops.

Fairly large amounts of fertilizer increase yields and crop residue. The residue can be turned under to increase organic matter and to reduce erosion. Lime benefits legumes and other crops and should be applied in amounts indicated by soil tests.

CAPABILITY UNIT IIw-1

Local alluvial land is the only soil in this capability unit. It is nearly level and occupies slight depressions. The soil is generally moderately well drained, though it ranges from well drained to somewhat poorly drained. The root zone is moderately thick to thick, the thickness depending on the type of underlying material and the depth to the water table. The texture varies, but the surface soil is generally loamy sand, and the subsoil is sandy loam to sandy clay loam.

This soil has moderate permeability and infiltration. The available moisture capacity is high to medium. Runoff is slow, especially in areas not artificially drained. The soil is generally high in plant nutrients, high to medium in organic matter, and strongly acid.

The soil in this capability unit is productive and important agriculturally, but it amounts to only about 1-1/2 percent of the county. Individual areas are small and generally range from 1 to 5 acres in size, but in a few places they are as large as 15 acres.

Excess water limits the use of this land to some extent, but this can be removed by ditching and tiling. Many small areas are ditched, or their drains are vegetated to make suitable outlets for surrounding soils. Most of the acreage in this capability unit is used for cultivated crops, and some areas are also suitable for pasture or hay. If this land is used for cultivated crops, drainage is needed. This land is suited to truck crops, corn, small grains, and soybeans, but it is not well suited to cotton and tobacco. Coastal bermudagrass, bahiagrass, whiteclover, and annual lespedeza are the best plants for hay or pasture. A suitable cropping system is oats and soybeans for 1 year followed by 2 years of row crops. All plant residue should be plowed under. Lime and fertilizer should be applied according to the results of soil tests and the needs of the crop to be grown.

CAPABILITY UNIT IIw-2

This capability unit consists mainly of deep, nearly level, moderately well drained soils. These soils generally have a gray to very dark gray loamy sand to sandy loam surface layer and a friable sandy loam or sandy clay loam subsoil. The soils are--

Dunbar sandy loam.
Goldsboro loamy sand.
Izagora sandy loam, gray variant.
Lynchburg sandy loam.

The Lynchburg soils are somewhat poorly drained. All the soils have moderate to moderately slow permeability and infiltration. They have medium available moisture capacity and, because they are close to the water table, can supply ample moisture for crops. Runoff is slow, and water stands in places for long periods unless drainage is established. In general, these soils are high in fertility, are medium in organic matter, and are strongly acid.

If drained, these soils are among the most productive in the county. They make up about 4 percent of the total land area. Nearly all of the acreage except that of the Lynchburg and Izagora soils is in cultivated crops. About 60 percent of the acreage of the Lynchburg and Isagora soils is in woods, but many areas are being cleared and drained. The Goldsboro and Dunbar soils require less drainage than the Lynchburg and Izagora soils and generally need to be drained only in small, low areas. Their drainage can be improved in many places by draining the adjacent, wetter soils.

The soils in this group are well suited to cotton, corn, small grains, soybeans, and truck crops, all of which are commonly grown. Among the best suited plants for hay and pasture are dallisgrass, bahiagrass, bermudagrass, whiteclover, and annual lespedeza. Row crops can be grown each year. They respond to heavy applications of fertilizer, which increase crop residue as well as yields. If crop residue and cover crops are plowed under, organic matter is increased and tilth improved.

These soils cannot be worked under so wide a range of moisture content as can the soils in capability subclasses IIe and IIs. It is well for the cropping system to provide close-growing crops half of the time; for example, 1 year of a small grain and lespedeza followed by 2 years of row crops, or a small grain and soybeans for 1 or 2 years followed by 1 or 2 years of row crops. All crop residue should be turned under. Lime should be applied according to the results of soil tests and the needs of the crop to be grown.

CAPABILITY UNIT IIw-4

Congaree silt loam, the only soil in this capability unit, is a deep, well-drained, nearly level soil on flood plains. In Calhoun County this soil is subject to only occasional overflow, which generally is caused by rains in winter or early in spring. The silt loam surface layer is dark brown. Although the subsoil is generally silt loam or silty clay loam, in some places it is fine sandy loam.

Permeability is moderately rapid, infiltration is slow to moderate, and the available moisture capacity is high. Because runoff is slow, water stands on the surface in some places after rains. The soil is medium acid, medium in organic-matter content, and medium to high in fertility. If organic matter is maintained, the soil is generally in good tilth and can be worked sooner after rains than can other soils on the flood plains. It cannot be worked, however, in wet periods.

This group makes up about 1-1/2 percent of the total land area of the county. Most of the acreage is in cutover stands of hardwoods, but about 25 percent has been cleared and is planted to row crops, pasture, and hay.

Well suited to this soil are crops that need a large amount of moisture and crops that are not damaged by short periods of flooding or that are not grown at the time floods are at their peak. Corn, small grains, soybeans, truck crops, annual lespedeza, and cowpeas are thus well suited. Dallisgrass, bahiagrass, bermudagrass, tall fescue, white clover, and crimson clover are suitable for hay or pasture. The soil needs fertilizer for continued high yields and responds well to it. Lime should be applied in amounts indicated by soil tests and according to the requirements of the crop grown. Where feasible, dikes can be built to protect crops from floodwaters.

CAPABILITY UNIT IIs-1

In this capability unit are deep, well-drained soils on nearly level and gently sloping uplands. The surface layer is thick, loose, gray to grayish-brown loamy sand that is about 24 inches thick in most places but ranges from 18 to 30 inches in thickness. The subsoil is yellowish-brown and yellowish-red, friable sandy loam and sandy clay loam. The soils in this group are--

Kalmia loamy sand, thick surface.
Norfolk loamy sand, thick surface, 0 to 2 percent slopes.
Norfolk loamy sand, thick surface, 2 to 6 percent slopes.
Ruston loamy sand, thick surface, 0 to 2 percent slopes.
Ruston loamy sand, thick surface, 2 to 6 percent slopes.

These soils have rapid infiltration, rapid permeability in the surface layer, and moderately rapid permeability in the subsoil. The available moisture capacity is medium, but the loamy sand surface layer is slightly droughty in dry periods, especially for shallow-rooted plants or newly established seedlings. The organic-matter content is medium to low. Natural fertility is low, and acidity is medium.

The soils in this capability unit make up about 9 percent of the total land area. About 75 percent of the acreage is in cultivation, and the rest is woodland and pasture. The principal crops commonly grown on these soils are cotton, small grains, soybeans, and corn, but watermelons, cantaloupes, peanuts, truck crops, and many other crops are also suited. Pecan and peach orchards are well suited to these soils. Legumes suitable for cover crops, hay, and pasture are crimson clover, annual lespedeza, and sericea lespedeza. Bahiagrass and Coastal bermudagrass are suitable for pasture and hay. Bicolor lespedeza is well suited for permanent patches of wildlife food.

These soils have a thick, loose root zone, are easily cultivated, and can be worked within a wide range of moisture content. Because the slopes are gentle and smooth and the soils are loose, farm machinery is easy to use. Winds early in spring cause considerable soil blowing in exposed areas that are dry and freshly plowed. Water erosion is a slight hazard and may cause rilling if the soils are bare and water is concentrated on the slopes. Cultivating on the contour and maintaining grassed outlets are useful in controlling the water erosion. Stripcropping reduces soil blowing and its resulting damage to young plants.

Large applications of fertilizer increase yields and produce more crop residue. If this residue is turned under along with cover crops, organic matter and the available moisture capacity are increased and good tilth is maintained. Lime applied according to the results of soil tests increases yields of sericea lespedeza, annual lespedeza, and other legumes and crops that respond to liming. Examples of a suitable cropping system are 1 year of a small grain and soybeans followed by 1 year of row crops; and 2 or 3 years of bahiagrass, grown alone or with sericea lespedeza, followed by 2 or 3 years of row crops. In the second cropping system crimson clover can also be seeded after the grass is well established.

CAPABILITY UNIT IIIe-1

This capability unit consists of well-drained soils on the sloping uplands. The surface layer of these soils is loose loamy sand. This layer is generally more than 8 inches thick, but its thickness ranges from 4 to 13 inches and depends on the amount of erosion. A few spots are galled, and then the yellowish-red subsoil is exposed. The subsoil is friable, yellowish-brown or yellowish-red sandy loam to sandy clay loam. The soils are--

Norfolk loamy sand, 6 to 10 percent slopes.
Norfolk loamy sand, thin solum, 6 to 10 percent slopes.
Orangeburg loamy sand, 6 to 10 percent slopes.
Orangeburg loamy sand, 6 to 10 percent slopes, eroded.

The root zone is thick in all these soils except Norfolk loamy sand, thin solum, 6 to 10 percent slopes, in which the root zone is moderately thick.

Infiltration of water into the soils is moderate. Because they are more sloping than the soils in capability unit IIe-1, these soils have more rapid runoff and slower infiltration. Permeability is moderate; the available moisture capacity is medium but is sufficient for most crops. Because of runoff, the erosion hazard is moderate. These soils are fairly low in organic matter, are medium in fertility, and are medium to strongly acid.

The soils in this group occupy about 1/2 of 1 percent of the county. They are used for all the common crops, but because they are more sloping than the soils in capability unit IIe-1 and are subject to moderate erosion, they are not so well suited to crops. Also, machinery is not so easy to use, because the slopes are less smooth. These soils can be worked, however, within a wide range of moisture content. Bahiagrass and Coastal bermudagrass are well suited for hay and pasture, and sericea lespedeza is one of the better suited legumes. If the soils are to be planted to row crops, yields and crop residue can be increased by fertilizing heavily and by keeping close-growing crops on them 2 years out of 3. By adding organic matter, tilth is improved and erosion lessened.

Erosion can be controlled by cultivating on the contour and using terraces and vegetated waterways. These soils can be grazed without damage from trampling in normally wet periods. Lime should be applied according to the results of soil tests and the requirements of the crop grown.

CAPABILITY UNIT IIIe-2

The soils in this capability unit are deep and well drained, and they have a red to yellowish-red, friable, fine-textured subsoil that is sticky when it is moist. These soils are on sloping uplands. Their surface layer is grayish brown or reddish brown and is generally sandy loam. It ranges from 3 to 9 inches in thickness. These soils, for the most part, are moderately eroded, but in a few severely eroded areas the red subsoil is exposed. The soils are--

Faceville loamy fine sand, 6 to 10 percent slopes, eroded.
Faceville and Ruston soils, 6 to 10 percent slopes.
Faceville and Ruston soils, 6 to 10 percent slopes, eroded.
Greenville sandy loam, 6 to 10 percent slopes, eroded.
Magnolia sandy clay loam, 2 to 6 percent slopes, severely eroded.
Magnolia sandy loam, 6 to 10 percent slopes.
Magnolia sandy loam, 6 to 10 percent slopes, eroded.

These soils have moderate infiltration and permeability and medium available moisture capacity. The supply of moisture is ample for most plants, but some water is lost in runoff. Generally, the supply of natural plant nutrients is medium to high and the organic-matter content is medium, but fertility and organic matter are low in areas where the subsoil is exposed. These soils are medium acid. The erosion hazard is severe.

These soils make up about 2 percent of the county. About two-thirds of their acreage is cultivated, and the rest is wooded, is pastured, or is idle. These soils are mainly in cotton, soybeans, small grains, and some corn, but they are suited to many other kinds of crops. Bermudagrass and bahiagrass are suitable for pasture and hay. Sericea lespedeza is a perennial legume suitable for hay or pasture. If row crops are to be grown, these sloping soils should be kept in close-growing crops two-thirds of the time to help control erosion. In a suitable cropping system, a small grain and lespedeza are grown for 2 years and are followed by 1 year of a row crop. In another system, bahiagrass and sericea lespedeza are grown for 3 or more years and are followed by 2 years of row crops.

Contour cultivation, including terraces and vegetated waterways, is a practical means of controlling erosion. Except where the surface layer is thin or missing, these soils are in reasonably good tilth and can be worked within a fairly wide range of moisture content. Because the soils in this group are not so smooth as are those in capability unit IIe-2, contour cultivation is more difficult to establish and maintain with machinery. In many small areas of these soils, it is more practical to maintain hay, pasture, or other perennial vegetation. Lime should be applied according to the results of soil tests and the requirements of the crop grown.

CAPABILITY UNIT IIIe-3

The soils in this capability unit are on sloping uplands and are deep and well drained. The surface layer is gray to grayish-brown, loose loamy sand that ranges from 3 to 9 inches in thickness. The subsoil is a red to yellowish-red sandy clay or clay with a firm, blocky structure. The soils are--

Caroline loamy sand, 6 to 10 percent slopes.
Caroline loamy sand, 6 to 10 percent slopes, eroded.

These soils have moderate infiltration into the surface layer and slow permeability in the subsoil. Because of these characteristics and the strong slopes, runoff is rapid and the erosion hazard in cultivated areas is severe. The available moisture capacity is medium. Fertility and the organic-matter content are generally low, especially in eroded areas or in those with a thin surface layer. These soils are strongly acid.

The soils in this group make up about 1/2 of 1 percent of the county. They are mainly in woods or pasture; only a small part is in row crops. These soils are well suited to timber production, especially that of loblolly and slash pines. They are less well suited to row crops than to timber because the erosion hazard is severe and the soils are in small, narrow areas. They are suitable for hay and pasture consisting of bahiagrass, bermudagrass, and annual and sericea lespedezas, but heavy fertilization is needed. Cotton, oats, soybeans, and grain sorghum are commonly grown but are not well suited.

If these soils are row cropped, they should be terraced and provided with vegetated outlets, but in many places terracing and contour cultivation are difficult because the soils have irregular slopes. A cropping system is suitable if it provides close-growing crops at least 2 years out of 3. One such system is 2 years of a small grain and annual lespedeza followed by 1 year of row crops. In another suitable system bahiagrass or sericea lespedeza is grown for 3 years or more and is followed by 2 years of row crops. These soils need heavy fertilization, but when fertilized at the same rate, they produce lower yields than do soils with a more friable, permeable subsoil. Lime is required and should be applied according to the results of soil tests and the needs of the crop grown.

CAPABILITY UNIT IIIe-4

The soils in this capability unit are moderately deep to deep and are gently sloping and sloping. The surface layer is gray to grayish-brown, loose loamy sand that generally ranges from 10 to 30 inches in thickness. The subsoil is compact or slightly cemented sandy clay and clay. The soils are--

Caroline loamy sand, thick surface, 6 to 10 percent slopes.
Killian loamy sand, 6 to 10 percent slopes.
Killian loamy sand, thick surface, 6 to 10 percent slopes.
Vaucluse loamy sand, 2 to 6 percent slopes, eroded.
Vaucluse loamy sand, 6 to 10 percent slopes.
Vaucluse loamy sand, thick surface, 6 to 10 percent slopes.

Vaucluse loamy sand, 2 to 6 percent slopes, eroded, is thinner in the surface layer than the other soils in this group. Erosion on this soil has thinned the surface layer to a thickness of 3 to 5 inches, and in a few places the subsoil is exposed. Water infiltrates rapidly into the coarse-textured surface layer of the soils in this group. Permeability is rapid, but the available moisture capacity is low. Because the subsoil is slowly permeable, the movement of water and air is limited. Runoff is medium. As a result of these characteristics, after heavy rains excess water on and in the surface layer causes a moderate to severe erosion hazard and the loss of plant nutrients. In places where the surface layer is more than 18 inches thick, these soils are slightly droughty and do not supply enough water for shallow-rooted crops. The Vaucluse soils, which have a compacted or cemented subsoil, are especially droughty. All the soils in this group are low in fertility and organic matter and are strongly acid.

The soils in this capability unit make up about 2-1/2 percent of the county. About one-sixth of this acreage has been cleared and is planted to crops, pasture, or hay; the rest is woodland. The soils are well suited to only a few crops, but they are fairly well suited to cotton, soybeans, oats, rye or ryegrass, and grain sorghum. They are suited to bahiagrass and bermudagrass for hay and pasture and to sericea lespedeza for hay and pasture or for control of erosion. They produce lower yields than the more friable and permeable soils even when fertilized and managed in about the same way.

Because erosion is difficult to control, contour cultivation, terraces, outlets protected by growing plants, and other practices of erosion control are needed. The slopes are uneven in many places and should be kept in strips of permanent plants. Erosion is reduced and organic matter increased if close-growing crops are grown on these soils 2 years out of every 3. Suitable cropping systems are 4 years of sericea lespedeza or bahiagrass followed by 2 years of row crops, and 2 years of oats and soybeans or annual lespedeza followed by 1 year of a row crop. Lime and fertilizer should be applied according to the results of soil tests and the needs of the crop grown. If these soils are not needed for crops or pasture, they probably should be left in woods.

CAPABILITY UNIT IIIe-5

This capability unit consists of deep, well-drained soils that have a thick surface layer and are on sloping uplands. The surface layer is gray to grayish-brown, loose loamy sand. It is 24 inches thick in most places but ranges from 18 to 30 inches in thickness. The subsoil is yellowish-brown to yellowish-red, friable sandy loam and sandy clay loam. The soils are--

Norfolk loamy sand, thick surface, 6 to 10 percent slopes.
Ruston loamy sand, thick surface, 6 to 10 percent slopes.

The surface layer of these soils has rapid infiltration and permeability. Permeability is moderately rapid in the subsoil. The available moisture capacity is medium in the subsoil and low in the loamy sand surface layer. The soils have medium runoff and, if they are planted to row crops, are moderately susceptible to erosion. Also, they are somewhat droughty and do not supply enough moisture for some plants, especially for shallow-rooted plants or newly established seedlings. The organic-matter content is medium to low, natural fertility is low, and acidity is medium.

The soils in this group make up about 1-1/2 percent of the county. Of this acreage approximately half is in trees and half is in crops. Only a small acreage is pastured. These soils are suited to cotton, corn, small grains, soybeans, watermelons, and sweet potatoes, and to peach and pecan trees. Keeping these soils in close-growing crops 2 years out of 3 somewhat reduces erosion and at the same time reduces droughtiness by increasing organic matter so that more moisture is retained in the loamy sand surface layer. For additional erosion control, the soils should be tilled on the contour, terraced, and provided with vegetated waterways.

A suitable cropping system is 2 years of a small grain and soybeans followed by 1 year of row crops, or 3 years of sericea lespedeza or bahiagrass

followed by 2 years of row crops. Liberal fertilization increases yields and, consequently, crop residue, which should be turned under to increase organic matter. Crimson clover, bahiagrass, and Coastal bermudagrass are suited to these soils and can be used for hay or pasture. Sericea lespedeza is a good perennial legume for hay and pasture. Lime should be applied according to the results of soil tests and the needs of the crop grown.

CAPABILITY UNIT IIIw-2

The soils of this capability unit are deep and poorly drained. They are nearly level and occupy low, flat areas and depressions. Their water table is high. The surface layer ranges from black to dark gray in color and from sandy loam to loam in texture. It ranges from 5 to 9 inches in thickness. The subsoil is generally gray, firm sandy clay or clay and is mottled with yellowish brown and red in the lower part. The soils are--

Coxville sandy loam.
Grady loam.
Grady sandy loam.

The infiltration and permeability of these soils are slow, and the available moisture capacity is medium. The soils are medium in fertility and are medium to high in organic-matter content. Their use is severely limited by the high water table.

These soils make up almost 3 percent of the county. About 25 percent of the acreage is in crops, 3 percent is in pasture, and the rest is woodland. The soils must be drained before they can be cultivated to row crops, pasture, or hay. Small areas can be drained by tile, but a combination of open ditches and tile is needed in the large areas. Although cotton is not well suited to these soils, it is grown in some small areas that are cropped with areas of adjoining soils. Corn, small grains, soybeans, and grain sorghum are suited and are commonly grown. Dallisgrass, bahiagrass, and tall fescue are suitable for pasture or hay. Suitable legumes are annual lespedeza, white clover, and crimson clover.

Row crops may be grown on these soils every year if crop residue and cover crops are turned under to increase organic matter and improve tilth. The soils cannot be worked or grazed, however, within so wide a range of moisture content as can many of the soils adjoining them, nor so soon after rains. A suitable cropping system consists of 1 or 2 years of oats and annual lespedeza followed by 1 or 2 years of row crops, or 1 year of a small grain and soybeans followed by 1 year of row crops. Liberal fertilization and the plowing under of crop residue increase the organic-matter content and yields. Lime, which is required for most crops and especially for legumes, should be applied according to the results of soil tests. These soils generally have sites suitable for dug ponds.

CAPABILITY UNIT IIIw-3

Chewacla silt loam is the only soil in this capability unit. It is a somewhat poorly drained, nearly level soil on flood plains. The surface layer is dark-brown to brown silt loam. The subsoil, though similar to the surface soil in color, ranges from silt loam to silty clay loam and is mottled with gray at a depth of 18 to 24 inches.

The root zone of this soil is only moderately deep except in drained areas. Permeability is moderate, infiltration is slow, and the available moisture capacity is high. Because of the high water table, the supply of moisture is ample for plants. The soil is medium in fertility and organic matter and is medium acid. Because it is flooded occasionally and has a high water table, it is severely limited in use.

This soil accounts for slightly more than 1 percent of the county. It is practically all woodland and produces high yields of hardwoods and loblolly pine. It must be drained, however, if crops are to be grown. Open ditches are satisfactory if suitable outlets are available, but diking is needed to protect some areas from overflow. The soil cannot be worked or grazed soon after rains or in wet periods.

If adequately drained, this soil is suited to corn, small grains, and soybeans. Suitable for hay or pasture are tall fescue, bermudagrass, dallisgrass, whiteclover, and annual lespedeza. If the soil is fertilized well and all crop residue is turned under, row crops can be grown every year. A suitable cropping system is 2 years of a small grain and lespedeza followed by 2 years of corn, or 2 years or more of tall fescue or another grass followed by 2 years of corn. Lime should be applied according to the results of soil tests.

CAPABILITY UNIT IIIw-4

This capability unit consists of very poorly drained, nearly level soils on uplands and stream terraces of the Coastal Plain. These soils have a thick, black, organic surface layer of loam and a gray, friable subsoil of sandy loam to sandy clay loam. Their root zone is moderately thick to thick. The soils are--

Okenee loam.
Portsmouth loam.

These soils have moderate to moderately slow permeability and moderate infiltration. Their available moisture capacity is medium, but because of the high water table, enough water is available to supply plants. The soils are medium to high in natural fertility and organic-matter content and are very strongly acid. Unless these soils are adequately drained, their use is severely limited by excess water.

The soils in this group make up about 1/2 of 1 percent of the county. Most of the acreage is wooded, but some areas have been cleared and are planted to corn or are used for pasture. Drainage is needed, however, if the soils are used for crops or pasture. The soils can be drained by open ditches, tile, or a combination of both. Small areas of the Portsmouth soil can be drained by draining the adjoining soils.

If drained, these soils are suited to corn, oats, soybeans, grain sorghum, and some truck crops.

Suitable for pasture and hay are dallisgrass, bahiagrass, tall fescue, whiteclover, and annual lespedeza. Turning under all crop residue and cover crops increases the organic-matter content and improves tilth. The soils cannot be worked within so wide a range of moisture content as can the adjoining higher lying soils, and they are injured by trampling if they are grazed when wet. A suitable cropping system is 1 year of oats and annual lespedeza followed by 1 year of a row crop, or 3 or more years of grass and whiteclover followed by 3 years of row crops.

Heavy applications of fertilizer and lime are needed for most crops and for pasture. The lime should be applied according to the results of soil tests. These soils are well suited to sprinkler irrigation, especially for truck crops. Many good sites for dug ponds are available.

CAPABILITY UNIT IIIs-1

The soils in this capability unit are on nearly level and gently sloping uplands and are deep and excessively drained. They have a gray to brown, loose, sand or loamy sand surface layer that extends to a depth of 30 to 42 inches and is underlain by loamy sand or sandy loam. The soils are--

Eustis loamy sand, 0 to 6 percent slopes.
Lakeland sand, shallow, 0 to 2 percent slopes.
Lakeland sand, shallow, 2 to 6 percent slopes.

These soils have very rapid permeability and infiltration and low to very low available moisture capacity. They are, therefore, droughty and subject to leaching. They are low in fertility and organic matter and are strongly acid.

The soils of this group are among the most extensive in the county and make up about 8-1/2 percent of the total land area. About half of the acreage is in woods and pasture, and half is in crops. All the common crops are grown on these soils, but they produce low yields because the available moisture is low. Fairly well suited to these soils are cotton, oats, rye, watermelons, and some truck crops that mature early in spring. Coastal bermudagrass and bahiagrass are among the better suited crops for hay and pasture, and sericea lespedeza is a well-suited perennial legume for permanent hay and pasture.

These soils require heavy fertilization to offset the severe leaching of elements in applied fertilizer. To help overcome this loss, it is necessary to add large amounts of organic matter frequently so that plant nutrients and moisture are absorbed and retained. The best way to add organic matter is to plant cover crops 2 years out of 3 and plow them under, and to plow under all crop residue. Adequate fertilization increases yields and, indirectly, increases organic matter. A suitable cropping system is 2 years of oats and crotalaria followed by 1 year of row crops, or 3 or 4 years of Coastal bermudagrass or sericea lespedeza followed by 2 years of row crops. Soil blowing early in spring can be greatly reduced by management that provides cover crops, stubble mulching, and stripcropping at right angles to the prevailing winds.

These soils can be worked within a wide range of moisture content and can be grazed in wet periods without damage from trampling. Because channels fill quickly in the loose soils, terracing generally is not suited. The soils can be tilled on the contour and planted in strips of sericea lespedeza. Lime and fertilizer should be applied according to the results of soil tests and the requirements of the crop grown.

CAPABILITY UNIT IVe-1

In this capability unit are deep, strongly sloping, moderately eroded soils and sloping, severely eroded soils. The surface layer generally ranges from 3 to 9 inches in thickness, and in small areas the subsoil is exposed. The subsoil is yellowish-red to red, friable sandy clay that is generally slightly sticky. The soils are--

Faceville and Ruston soils, 10 to 15 percent slopes, eroded.
Magnolia sandy clay loam, 6 to 10 percent slopes, severely eroded.
Magnolia sandy loam, 10 to 15 percent slopes, eroded.
Orangeburg loamy sand, 10 to 15 percent slopes, eroded.

Areas now in Magnolia sandy clay loam, 6 to 10 percent slopes, severely eroded, once had a sandy loam surface layer, but it has been entirely eroded away in some places. In other places a small part of the original surface layer has been mixed into the sandy clay subsoil by plowing. Because runoff is rapid on the soils in this group, infiltration is slow. Permeability is moderate in the subsoil, and the available moisture capacity, though medium, is ample for deep-rooted perennials and trees. The soils are low in fertility and organic-matter content and are medium acid. They are susceptible to severe erosion, and their use for crops is greatly limited.

The soils in this group make up slightly less than 1 percent of the county. About a third of their acreage is woodland, a third is pasture, and a third is cropland. Planting row crops on these soils every year is not feasible unless the expensive practices necessary to control erosion can be justified. If these soils are needed for crops, it is best to plant row crops in only one-fourth of the acreage each year and to keep the rest in close-growing crops. A suitable cropping system for small areas consists of 3 years of sericea lespedeza followed by 1 year of a row crop. Cotton and corn can be grown, but they produce low yields. Bermudagrass is fairly well suited for pasture and hay, and sericea lespedeza is a suitable perennial legume. These soils are best used as woodland, and they produce good yields of loblolly and slash pines.

CAPABILITY UNIT IVe-3

In this capability unit are strongly sloping soils from which the surface layer has been eroded to a thickness of 3 to 9 inches. The subsoil is

red to yellowish-red, firm sandy clay or clay. The soils are--

Caroline loamy sand, 10 to 15 percent slopes.
Caroline loamy sand, 10 to 15 percent slopes, eroded.

On these soils runoff is generally rapid, permeability is slow, and the available moisture capacity is medium. In many places ample moisture is available from ground water for trees and other perennial plants. Fertility and organic matter vary according to the amount of erosion and are medium to low. These soils are strongly acid.

The soils in this group make up less than 1/2 of 1 percent of the county. Almost all of the acreage is woodland, but a few areas are used for pasture and hay. It is better to keep the soils in close-growing perennials than in row crops, which generally are not suited. Bermudagrass and bahiagrass are the most suitable grasses for pasture and hay, and sericea lespedeza is the most suitable perennial legume. Annual lespedeza grows fairly well and can be seeded with bermudagrass. If row crops are planted on these soils, the erosion hazard is severe and yields are low. Contour cultivation is difficult on the strong slopes because the surface is uneven in many places.

If acreage is needed for row crops, these should be planted in only one-fourth of the area, and the rest of the area should be kept in close-growing crops. In small areas a row crop may be planted 1 year out of 4 if the soils are tilled on the contour. The most suitable row crops are corn, oats, and soybeans. These soils are best used as woodland. Loblolly and slash pines grow well. Many places are suitable for farm ponds.

CAPABILITY UNIT IVe-4

This capability unit consists of moderately deep soils with a compact or slightly cemented subsoil. Some of the soils are sloping and moderately eroded, and some are strongly sloping and slightly eroded. The surface layer ranges from 3 to as much as 30 inches in thickness, but the range is generally from 3 to 12 inches. Gullies occur in a few places, and in some places the reddish or yellowish subsoil is exposed. The soils are--

Killian loamy sand, 6 to 10 percent slopes, eroded.
Killian loamy sand, 10 to 15 percent slopes.
Vaucluse loamy sand, 6 to 10 percent slopes, eroded.
Vauluse loamy sand, 10 to 15 percent slopes.
Vaucluse loamy sand, thick surface, 10 to 15 percent slopes.

These soils have rapid runoff, slow infiltration, and slow permeability in the subsoil. Their available moisture capacity is medium to low. They are low in fertility, medium to low in organic-matter content, and strongly acid.

The soils in this group make up about 2 percent of the county. Practically all of their acreage is woodland, but a few areas are in cropland or pasture. Mainly because of the severe erosion hazard, these soils generally are not suited to row crops. They are better suited to bermudagrass, bahiagrass, sericea lespedeza, or other perennials. Although heavy fertilization is required, yields are low. If it is necessary to cultivate these soils, they should be kept in sericea lespedeza for 3 or 4 years. In this way, about one-fourth of the acreage can be planted to a row crop each year. Corn, oats, and soybeans are the most suitable row crops. Small areas can be kept in sericea lespedeza for 3 years, and the lespedeza followed by 1 year of a row crop. The soils in this capability unit are best used for pine trees. Pine grows well on the Killian soils and fairly well to poorly on the Vaucluse soils.

CAPABILITY UNIT IVe-5

Ruston loamy sand, thick surface, 10 to 15 percent slopes, is the only soil in this capability unit. The surface layer of this strongly sloping, deep soil ranges from 18 to 30 inches in thickness. The subsoil is yellowish-brown, friable sandy loam to sandy clay loam.

This soil has fairly rapid infiltration. Permeability is rapid in the surface layer and moderately rapid in the subsoil. The available moisture capacity is low in the surface layer and medium in the subsoil. Medium runoff causes a moderate erosion hazard. This soil is slightly droughty and at times does not supply enough water for plants, especially for shallow-rooted or newly established ones. Fertility and organic matter are medium to low, and the soil is medium acid.

This soil makes up less than 1/2 of 1 percent of the county and is practically all wooded. It is not suitable for continuous row cropping, but cotton, corn, and oats grow fairly well. If row crops must be grown, heavy fertilization and intensive practices to control erosion are needed. A row crop can be grown 1 year out of 4 after close-growing crops have been grown for several years. Winter legumes can be grown after the soil has been in grass 3 or 4 years and the supply of plant nutrients and organic matter has been replenished. Bahiagrass and Coastal bermudagrass are suitable for pasture and hay, and sericea lespedeza is a suitable perennial legume.

This soil can be grazed in wet weather without serious damage, and it can be worked within a fairly wide range of moisture content. Growing trees is the best use for this soil; loblolly and slash pines grow well.

CAPABILITY UNIT IVw-1

In this capability unit are nearly level, poorly drained or somewhat poorly drained soils that occur on the flood plains of rivers. These soils have a brown silt loam or silty clay loam surface layer that ranges from 6 to 12 inches in thickness. Their subsoil is mottled, slightly plastic silty clay loam. The soils are--

Congaree-Chewacla silt loams.
Wehadkee and Chewacla silt loams.

Congaree-Chewacla silt loams are variable in characteristics and are generally somewhat poorly drained. All the soils in this group are subject to

frequent flooding and have a high water table, which limits the depth of the root zone. Because runoff and permeability are slow, water frequently stands on the surface in wet seasons. These soils are medium in fertility, are high in organic-matter content, and are strongly acid.

These soils make up about 2.5 percent of the county and are practically all wooded. The excess water greatly limits the use of these soils. If adequately drained, however, they are suited to tall fescue, dallisgrass, and whiteclover for permanent pasture and for hay, and to oats and ryegrass for pasture. Annual lespedeza is also suitable for hay.

Fertilizer and lime should be applied according to the results of soil tests and the needs of the plants. If these soils are grazed when wet, they are injured by trampling. They are best left in native hardwoods and loblolly pine. Although extensive drainage is needed, many areas cannot be drained and are too far from suitable outlets. Diking is needed to protect some areas from floods.

CAPABILITY UNIT IVw-3

This capability unit consists of poorly drained, nearly level soils of the stream terraces and uplands. These soils have a dark-gray, sandy loam and loamy sand surface layer, commonly 6 inches thick, and a gray, sandy clay loam to sandy clay subsoil that is mottled with yellow and brown. The soils are--

Myatt loamy sand.
Rains sandy loam.

These soils have medium infiltration into the surface layer and moderately slow permeability in the subsoil. Although the available moisture capacity is medium, the water table is frequently at or near the surface and severely limits use. Natural fertility is low, and the soils are strongly acid. The organic-matter content ranges from high to low.

These soils make up about 1/2 of 1 percent of the county. About three-fourths of the acreage is wooded, and the rest has been cleared. The soils are generally not well suited to crops, but small, adequately drained areas can be planted to row crops along with adjacent areas in row crops. Corn, oats, soybeans, and truck crops can be grown. Carpetgrass grows naturally in many open areas and can be improved for grazing by adding fertilizer and lime. In adequately drained areas, dallisgrass, bahiagrass, and bermudagrass can be grown. Whiteclover and annual lespedeza are fairly well suited legumes. Unless these soils have been cleared, however, they should be left in native trees and their yields improved by good management. Sites suitable for dug ponds are common.

CAPABILITY UNIT IVw-4

Only Mixed alluvial land is in this capability unit. It is generally poorly drained but ranges from somewhat poorly drained to very poorly drained. Both texture and color vary. This land is limited in use because it is frequently flooded and has water on or near the surface most of the time. It is high in organic matter and is strongly acid.

This land accounts for about 3 percent of the county. Almost all of it is wooded, but a few areas have been cleared for pasture. The land is along streams and is difficult to drain because there is much water and ditchbanks are not stable. Some places, however, can be drained enough to seed pasture that can be grazed in dry periods. Dallisgrass and carpetgrass are suitable for pasture. Woodland, however, is the best use, and the native stands of hardwoods can be improved by good management. Sites suitable for ponds are common.

CAPABILITY UNIT IVs-1

In this capability unit are deep, excessively drained, gently sloping and sloping sands and loamy sands that range from 30 inches to as much as 10 feet in thickness. These soils have a grayish-brown or brown surface layer and a yellowish-brown or yellowish-red subsoil. They are--

Eustis loamy sand, 6 to 10 percent slopes.
Eustis sand, 0 to 6 percent slopes.
Eustis sand, 6 to 10 percent slopes.
Lakeland loamy sand.
Lakeland sand, 0 to 6 percent slopes.
Lakeland sand, 6 to 10 percent slopes.
Lakeland sand, shallow, 6 to 10 percent slopes.

These soils have very rapid infiltration and permeability and low to very low available moisture capacity. Consequently, the soils are droughty and are leached of plant nutrients readily. They are low in fertility and organic matter and are strongly acid. Moderate hazards are wind erosion in large exposed fields and water erosion in the more sloping areas.

The soils of this group are among the most extensive in the county and make up about 19 percent of it. About 85 percent of the acreage is wooded. The rest has been cleared and is cropland or is growing up in broomstraw or other native plants. Only a small acreage is in permanent pasture.

These soils are generally not suited to row crops, but they can produce low yields of corn, cotton, grain sorghum, soybeans, watermelons, oats, and rye. Yields can be increased by adding large amounts of organic matter and fertilizer. Bahiagrass and Coastal bermudagrass are suitable grasses for hay or pasture, and sericea lespedeza is the best suited perennial legume. The lespedeza can be planted with bermudagrass or bahiagrass. Crotalaria is a good annual legume for use as a cover crop to increase organic matter.

If it is necessary to use these soils for row crops or pasture, a suitable cropping system that adds organic matter is 3 or 4 years of crotalaria, and then 1 year of corn and velvet beans or 1 year of some other row crop. Another suitable cropping system is 4 or 5 years of bahiagrass and sericea lespedeza and then 1 or 2 years of corn and velvet beans or some other row crop.

If the soils are tilled on the contour, the cropping system is more effective and erosion is reduced. In large fields soil blowing can be greatly reduced by alternating strips of close-growing crops with strips of clean-tilled crops. Soil blowing is also

reduced by windbreaks that extend at right angles to the wind. Because the soils are loose and sandy, terraces cannot be maintained.

If these soils are pastured, care must be taken not to overgraze them. Pines grow slowly, but the soils are suited to slash, longleaf, and loblolly pines if the blackjack oak is controlled. The soils can be developed into various recreational areas and are suitable for ponds in many places.

CAPABILITY UNIT Vw-2

Plummer-Rutlege loamy fine sands, the only soils in this capability unit, are wet and poorly drained or very poorly drained. Their surface layer is black, loose loamy fine sand, and their subsoil is gray to dark-gray loamy fine sand. These soils are in nearly level depressions and along drainageways. They are rapidly permeable, have low to medium available moisture capacity, are low in plant nutrients, and are strongly acid. The organic-matter content of the surface layer is high.

These soils amount to only about 1/10 of 1 percent of the county. Most of the acreage is wooded, but a few cleared areas are in carpetgrass. The soils are not suited to row crops, and they are hard to manage for pasture. Because they are excessively wet, they are suited to only limited grazing. Drainage is difficult. In many places there are no adequate outlets, and because of the loose, sandy subsoil, the banks of open ditches cave in. Heavy fertilization is required for pasture and improves grazing on fields of carpetgrass. If the soils can be adequately drained, bermudagrass and bahiagrass grow fairly well and can be seeded with whiteclover and annual lespedeza. Lime should be applied according to the results of soil tests. These soils are suited to loblolly pine, pond pine, and hardwoods. Native stands of timber can be improved by good management.

CAPABILITY UNIT VIe-1

Magnolia sandy clay loam, 10 to 15 percent slopes, severely eroded, is the only soil in this capability unit. All of the surface layer and some of the subsoil have been lost through erosion, and the red, sandy clay loam subsoil is exposed. This strongly sloping soil is susceptible to further severe erosion. The subsoil is deep and retains moisture, but much rainfall is lost in runoff because the surface has slow infiltration.

This soil accounts for about 1/10 of 1 percent of the county and generally is in small, narrow areas. Practically all of the acreage that has been cleared has reverted to trees. Because of the severe erosion hazard, the soil is not suited to row crops. It can be used safely for permanent, close-growing plants, but it is best suited to trees, especially pine. The woodland can be made more productive in many places by good management.

If they are well established, sericea lespedeza, bahiagrass, and bermudagrass grow fairly well on this soil. They can be used for limited grazing or for hay on slopes smooth enough for mowing. Overgrazing, however, increases the erosion hazard. Bicolor lespedeza is fairly well suited as food for wildlife. Heavy fertilization is required to establish and maintain these perennials. Lime should be applied according to the results of soil tests.

CAPABILITY UNIT VIe-2

This capability unit consists of eroded and severely eroded soils on moderate to steep slopes. The soils have a compact or slightly cemented subsoil that retards the movement of water and air and the penetration of roots. The surface layer generally is 3 to 5 inches thick. The soils are--

Caroline sandy clay loam, 6 to 10 percent slopes, severely eroded.
Vaucluse loamy sand, 10 to 15 percent slopes, eroded.
Vaucluse loamy sand, 15 to 20 percent slopes, eroded.

The surface layer of the Caroline soil is generally less than 3 inches thick or is entirely missing. The soils in this group are subject to very rapid runoff and have a low available moisture capacity. The loamy sands have moderate infiltration, but their surface layer is often saturated because permeability is slow in the subsoil.

These soils make up about 1 percent of the county. Almost all of their acreage is wooded. The soils are not suited to row crops and, because of the severe erosion hazard, are of limited use for hay and pasture. If these soils are needed for forage crops, sericea lespedeza and bermudagrass can be grown, but yields are low even if large amounts of fertilizer are applied. Overgrazing increases the erosion hazard. Lime should be applied according to the results of soil tests. Bicolor lespedeza can be grown for wildlife food and cover.

It is best and safest to use these soils for pine trees, but these grow slowly on the Vaucluse soils, and windthrow is a hazard. Pines have a higher growth rate on the Caroline soil.

CAPABILITY UNIT VIs-1

The soils in this capability unit are strongly sloping and excessively drained. They are a sand and a loamy sand that extend to a depth of 30 to 42 inches. They have a gray or brown surface layer and a yellowish-brown and yellowish-red subsoil. A few gullies are present. The soils are--

Eustis loamy sand, 10 to 15 percent slopes.
Lakeland sand, shallow, 10 to 15 percent slopes.

These soils have rapid permeability and low available moisture capacity and are therefore droughty. Cleared areas are likely to erode. The soils are low in fertility, are low to medium in organic matter, and are strongly acid.

These soils amount to about 1/2 of 1 percent of the county and are practically all wooded or in broomsedge. They are not suited to row crops but are suited to permanent, close-growing plants. They can be used for hay and limited grazing, but care must be taken against overgrazing. Lime and large amounts of fertilizer are needed and should be applied as indicated by soil tests. Coastal or common bermudagrass and bahiagrass are suitable

for pasture. Sericea lespedeza is a suitable perennial legume for hay and grazing and can be seeded with bermudagrass or bahiagrass. Annual lespedeza can also be seeded with these grasses.

These soils are best used as woodland. They supply enough moisture for trees. Slash, loblolly, and longleaf pines grow well if competition from hardwoods is overcome. The native stands can generally be made more productive by good management.

CAPABILITY UNIT VIIe-2

In this capability unit is a steep, eroded soil and miscellaneous land types that are sloping or moderately steep. The eroded soil has a compact sandy clay subsoil. The land types vary in texture of the subsoil, in profile development, in thickness of the surface layer, in amount of sandy overburden, and in other characteristics. In the group are--

Caroline loamy sand, 15 to 25 percent slopes, eroded.
Sandy and clayey land, sloping.
Sandy and clayey land, moderately steep.

If the Caroline soil and the land types are cleared, they are susceptible to severe erosion. They are extremely variable in permeability, infiltration, available moisture capacity, and other characteristics. In most places they are strongly acid.

This group makes up about 7-1/2 percent of the county. Practically all of the acreage is wooded. A few areas have been cleared and are reverting to trees or other native plants. Woodland is the only suitable use. Enough moisture is generally available for trees. Pines and, in many places, hardwoods grow well. The productivity of many native stands can be increased by good management.

CAPABILITY UNIT VIIw-1

Only Swamp is in this capability unit. It is on nearly level stream bottoms. It is very poorly drained, and water stands on the surface for long periods. Texture, color, and depth vary, and the profile shows very little development. Swamp is generally high in organic-matter content and is strongly acid.

This land type amounts to about 4 percent of the county and, except for a few areas, is wooded. It is difficult and impractical to drain this land. Management to increase production of the native hardwoods is best. Many sites are suitable for ponds.

CAPABILITY UNIT VIIs-1

In this capability unit are strongly sloping, excessively drained, yellowish-brown to brown sands that extend to a depth of 3 to 10 feet. The soils are--

Eustis sand, 10 to 15 percent slopes.
Lakeland sand, 10 to 15 percent slopes.

These soils have a very low available moisture capacity and are droughty. Permeability is very rapid, and infiltration is rapid. The soils are low in organic matter and plant nutrients and are strongly acid. Areas with concentrated runoff are susceptible to erosion.

These soils make up slightly more than 1 percent of the county. Practically all of the acreage is in trees, mostly blackjack oak and longleaf pine. These soils are not suitable for cultivation, but they can be used as woodland. Slash and longleaf pines grow very slowly, but if the native blackjack oak is eradicated, the moisture available for pine is increased and reseeding is encouraged.

CAPABILITY UNIT VIIs-2

Only Borrow pits are in this capability unit. They consist of areas in which soil material, sand, or gravel have been dug and used for road fill, surfacing, or other uses. The pits are generally drained to prevent water from standing and are growing up in pine and other wild plants. The exposed soil material is variable. In some pits, pine can be grown or bermudagrass can be planted for limited grazing. A few areas can be used as ponds or as building sites.

Estimated yields and suitability [1]

In this subsection, table 1 lists estimated average acre yields of the principal crops on each soil in the county. Table 2 gives the relative suitability of each soil for the crops that are commonly grown or that are suited to the soils and to the climate.

ESTIMATED YIELDS

The estimated yields in table 1 are for a long period. Yields are given for each soil under two levels of management. Yields for Borrow pits, Sandy and clayey land, and Swamp are not listed in table 1. The yields listed in columns A are expected under the management now prevailing in the county. The yields in columns B are expected under improved management. Generally, yields in columns B are higher than those in columns A. The yields for high-value crops, however, may show little difference because those crops are now grown under the highest level of management believed to be feasible.

The yields in columns A are based largely (1) on observations made by members of the soil survey party; (2) on information obtained by interviews with farmers and other agricultural workers who have had experience with the soils and crops of the area; and (3) on comparisons with yield tables for other counties in South Carolina that have similar soils. For most soils, however, records of crop yields were not available when these estimates were made.

The requirements of good management vary according to the soils, but to obtain the yields in columns B it is necessary to (1) select suitable crops and cropping systems; (2) add commercial

[1] W. A. MASON, management agronomist, and W. C. WHITE, soil conservationist, Soil Conservation Service, assisted in writing this subsection.

TABLE 1.--Estimated average acre yields of the principal crops under two levels of management

[Yields in columns A are obtained under common management; those in columns B are to be expected under improved management. Absence of yield indicates crop is not commonly grown]

Soil	Cotton		Corn		Soybeans		Oats		Wheat		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B
	Lb.	Lb.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Cow-acre-days 1/	Cow-acre-days 1/
Caroline loamy sand, 2 to 6 percent slopes	300	500	35	60	18	25	35	50	20	28	140	230
Caroline loamy sand, 2 to 6 percent slopes, eroded	270	480	30	55	16	23	33	50	18	26	140	230
Caroline loamy sand, 6 to 10 percent slopes	270	480	30	55	16	23	33	50	18	26	130	220
Caroline loamy sand, 6 to 10 percent slopes, eroded	235	450	25	50	12	20	25	40	14	22	120	200
Caroline loamy sand, 10 to 15 percent slopes	200	300	20	30	10	20	20	30	10	20	100	180
Caroline loamy sand, 10 to 15 percent slopes, eroded	200	300	15	25	5	10	15	20	10	15	100	170
Caroline loamy sand, 15 to 25 percent slopes, eroded	---	-----	--	--	--	--	--	--	--	--	---	---
Caroline loamy sand, thick surface, 2 to 6 percent slopes	200	300	25	40	--	20	25	35	15	20	120	200
Caroline loamy sand, thick surface, 6 to 10 percent slopes	180	280	20	35	--	17	22	30	15	20	120	200
Caroline sandy clay loam, 6 to 10 percent slopes, severely eroded	---	-----	--	--	--	--	--	--	--	--	---	160
Chewacla silt loam	---	-----	40	80	--	30	--	80	--	--	250	365
Congaree silt loam	---	-----	60	100	25	40	60	90	30	50	280	365
Congaree-Chewacla silt loams	---	-----	40	80	--	30	--	80	--	--	280	365
Coxville sandy loam	---	500	40	80	15	30	30	70	--	35	260	325
Dunbar sandy loam	400	750	45	85	15	30	35	70	20	35	260	325
Eustis loamy sand, 0 to 6 percent slopes	200	400	15	25	10	20	25	40	15	20	170	325
Eustis loamy sand, 6 to 10 percent slopes	200	450	15	25	10	20	25	40	15	20	170	325
Eustis loamy sand, 10 to 15 percent slopes	---	-----	--	--	--	--	--	--	--	--	150	280
Eustis sand, 0 to 6 percent slopes	---	-----	--	--	--	--	--	--	--	--	150	280
Eustis sand, 6 to 10 percent slopes	---	-----	--	--	--	--	--	--	--	--	150	280
Eustis sand, 10 to 15 percent slopes	---	-----	--	--	--	--	--	--	--	--	---	---
Faceville loamy fine sand, 0 to 2 percent slopes	500	1,000	40	80	20	30	40	80	20	35	200	365
Faceville loamy fine sand, 2 to 6 percent slopes	500	1,000	40	80	20	30	40	80	20	35	200	365
Faceville loamy fine sand, 2 to 6 percent slopes, eroded	400	800	35	70	15	25	35	75	15	30	170	300
Faceville loamy fine sand, 6 to 10 percent slopes, eroded	300	600	30	60	12	20	30	70	15	30	150	275
Faceville and Ruston soils, 0 to 2 percent slopes	500	950	40	80	20	30	40	80	20	35	200	365
Faceville and Ruston soils, 2 to 6 percent slopes	500	950	40	80	20	30	40	80	20	35	200	365
Faceville and Ruston soils, 2 to 6 percent slopes, eroded	450	900	35	70	15	25	35	75	18	30	170	300
Faceville and Ruston soils, 6 to 10 percent slopes	400	800	30	60	15	25	35	75	20	35	190	350
Faceville and Ruston soils, 6 to 10 percent slopes, eroded	300	600	20	50	12	20	30	70	12	20	150	275
Faceville and Ruston soils, 10 to 15 percent slopes, eroded	---	-----	--	--	--	--	--	--	--	--	130	250

TABLE 1.--Estimated average acre yields of the principal crops under two levels of management--Continued

[Yields in columns A are obtained under common management; those in columns B are to be expected under improved management. Absence of yield indicates crop is not commonly grown]

Soil	Cotton		Corn		Soybeans		Oats		Wheat		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B
	Lb.	Lb.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Cow-acre-days 1/	Cow-acre-days 1/
Goldsboro loamy sand	500	900	40	80	15	30	35	70	15	30	260	325
Grady loam	---	500	30	70	10	25	30	70	--	25	150	260
Grady sandy loam	---	500	30	70	10	25	30	70	--	25	150	260
Greenville sandy loam, 0 to 2 percent slopes	500	1,000	40	75	20	30	40	80	25	40	250	380
Greenville sandy loam, 2 to 6 percent slopes	500	1,000	40	75	20	30	40	80	25	40	250	380
Greenville sandy loam, 2 to 6 percent slopes, eroded	450	900	30	60	15	25	35	75	20	35	200	300
Greenville sandy loam, 6 to 10 percent slopes, eroded	400	800	30	60	15	25	30	70	15	30	180	275
Izagora sandy loam, gray variant	250	500	30	60	15	25	30	60	12	20	160	300
Kalmia loamy sand, thick surface	300	500	20	45	15	25	25	50	12	25	170	325
Killian loamy sand, 2 to 6 percent slopes	250	450	25	40	15	25	25	50	15	25	175	300
Killian loamy sand, 6 to 10 percent slopes	200	400	20	35	12	20	20	40	12	20	120	280
Killian loamy sand, 6 to 10 percent slopes, eroded	---	-----	--	--	--	--	--	--	--	--	110	265
Killian loamy sand, 10 to 15 percent slopes	---	-----	--	--	--	--	--	--	--	--	100	200
Killian loamy sand, thick surface, 2 to 6 percent slopes	200	350	20	40	12	20	20	40	12	20	110	200
Killian loamy sand, thick surface, 6 to 10 percent slopes	200	350	15	35	12	20	20	40	12	20	110	200
Lakeland loamy sand	175	400	15	25	10	20	25	40	15	20	170	325
Lakeland sand, 0 to 6 percent slopes	175	350	20	35	10	18	25	50	10	15	120	280
Lakeland sand, 6 to 10 percent slopes	175	350	15	30	10	18	20	40	10	15	100	200
Lakeland sand, 10 to 15 percent slopes	---	-----	--	--	--	--	--	--	--	--	---	---
Lakeland sand, shallow, 0 to 2 percent slopes	200	450	20	40	12	18	20	50	12	20	150	300
Lakeland sand, shallow, 2 to 6 percent slopes	175	400	15	35	10	16	20	50	12	20	140	300
Lakeland sand, shallow, 6 to 10 percent slopes	150	350	15	35	8	14	20	45	10	16	120	250
Lakeland sand, shallow, 10 to 15 percent slopes	---	-----	--	--	--	--	--	--	--	--	120	280
Local alluvial land	300	600	40	80	20	30	40	75	20	30	200	320
Lynchburg sandy loam	350	700	40	80	20	30	40	75	20	30	220	320
Magnolia sandy clay loam, 2 to 6 percent slopes, severely eroded	300	500	20	40	15	25	20	40	15	25	150	220
Magnolia sandy clay loam, 6 to 10 percent slopes, severely eroded	300	500	25	50	15	20	15	30	10	20	100	200
Magnolia sandy clay loam, 10 to 15 percent slopes, severely eroded	---	-----	--	--	--	--	--	--	--	--	100	200
Magnolia sandy loam, 0 to 2 percent slopes	500	1,000	40	75	20	30	40	80	20	30	250	365
Magnolia sandy loam, 2 to 6 percent slopes	500	1,000	40	75	20	30	40	80	20	30	250	365
Magnolia sandy loam, 2 to 6 percent slopes, eroded	450	900	30	60	15	25	35	75	15	30	200	300
Magnolia sandy loam, 6 to 10 percent slopes	450	900	30	70	20	30	35	75	20	35	200	300

TABLE 1.--Estimated average acre yields of the principal crops under two levels of management--Continued

[Yields in columns A are obtained under common management; those in columns B are to be expected under improved management. Absence of yield indicates crop is not commonly grown]

Soil	Cotton		Corn		Soybeans		Oats		Wheat		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B
	Lb.	Lb.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Cow-acre-days 1/	Cow-acre-days 1/
Magnolia sandy loam, 6 to 10 percent slopes, eroded	400	800	25	60	15	25	30	60	15	25	180	275
Magnolia sandy loam, 10 to 15 percent slopes, eroded	300	500	20	50	15	20	20	40	10	20	130	250
Marlboro fine sandy loam, 0 to 2 percent slopes	500	1,000	40	80	25	35	40	80	25	40	250	365
Marlboro fine sandy loam, 2 to 6 percent slopes	500	1,000	40	80	25	35	40	80	25	40	250	365
Mixed alluvial land	---	-----	--	--	--	--	--	--	--	--	100	150
Myatt loamy sand	---	-----	--	--	--	--	--	--	--	--	100	150
Norfolk loamy sand, 0 to 2 percent slopes	500	900	40	70	20	30	35	70	20	30	240	350
Norfolk loamy sand, 2 to 6 percent slopes	500	900	40	70	20	30	35	70	20	30	240	350
Norfolk loamy sand, 2 to 6 percent slopes, eroded	400	800	35	60	15	28	30	60	15	25	220	340
Norfolk loamy sand, 6 to 10 percent slopes	400	800	35	60	15	28	30	60	18	30	220	340
Norfolk loamy sand, thick surface, 0 to 2 percent slopes	400	700	30	60	15	25	30	60	15	25	220	340
Norfolk loamy sand, thick surface, 2 to 6 percent slopes	400	700	25	55	15	25	30	60	15	25	220	340
Norfolk loamy sand, thick surface, 6 to 10 percent slopes	350	600	20	50	10	20	25	55	12	20	200	320
Norfolk loamy sand, thin solum, 2 to 6 percent slopes	500	900	40	70	20	30	35	70	20	30	240	350
Norfolk loamy sand, thin solum, 2 to 6 percent slopes, eroded	400	750	35	60	15	28	30	60	15	25	220	340
Norfolk loamy sand, thin solum, 6 to 10 percent slopes	400	750	35	60	15	28	30	60	15	30	220	340
Okenee loam	---	-----	20	50	--	--	20	40	--	--	180	300
Orangeburg loamy sand, 0 to 2 percent slopes	450	800	40	70	20	30	35	70	20	30	220	340
Orangeburg loamy sand, 2 to 6 percent slopes	450	800	40	70	20	30	35	70	20	30	220	340
Orangeburg loamy sand, 2 to 6 percent slopes, eroded	400	750	30	60	15	28	30	70	20	30	200	300
Orangeburg loamy sand, 6 to 10 percent slopes	400	750	30	70	15	28	30	70	20	30	200	300
Orangeburg loamy sand, 6 to 10 percent slopes, eroded	300	600	25	60	15	25	30	60	15	25	180	275
Orangeburg loamy sand, 10 to 15 percent slopes, eroded	200	400	15	40	10	18	20	40	12	20	130	250
Plummer-Rutlege loamy fine sands (Plummer part)	---	-----	--	--	--	--	--	--	--	--	90	200
Portsmouth loam	---	-----	25	60	15	25	25	55	--	--	180	300
Rains sandy loam	---	-----	20	40	12	18	25	55	--	--	100	250

TABLE 1.--Estimated average acre yields of the principal crops under two levels of management--Continued

[Yields in columns A are obtained under common management; those in columns B are to be expected under improved management. Absence of yield indicates crop is not commonly grown]

Soil	Cotton		Corn		Soybeans		Oats		Wheat		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B
	Lb.	Lb.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Cow-acre-days 1/	Cow-acre-days 1/
Ruston loamy sand, thick surface, 0 to 2 percent slopes	400	700	30	60	15	25	30	60	15	25	220	340
Ruston loamy sand, thick surface, 2 to 6 percent slopes	400	700	25	55	15	25	30	60	15	25	220	340
Ruston loamy sand, thick surface, 6 to 10 percent slopes	350	600	20	50	10	20	25	55	12	20	200	320
Ruston loamy sand, thick surface, 10 to 15 percent slopes	300	500	20	50	10	20	20	60	18	28	200	320
Tifton sandy loam, 2 to 6 percent slopes	500	1,000	40	80	25	35	40	80	25	40	240	350
Vaucluse loamy sand, 2 to 6 percent slopes	200	450	20	35	12	20	20	50	10	20	100	250
Vaucluse loamy sand, 2 to 6 percent slopes, eroded	175	400	15	30	10	15	20	40	8	20	90	225
Vaucluse loamy sand, 6 to 10 percent slopes	170	350	15	30	10	15	20	40	8	20	100	250
Vaucluse loamy sand, 6 to 10 percent slopes, eroded	160	300	12	25	10	15	15	35	8	18	80	200
Vaucluse loamy sand, 10 to 15 percent slopes	---	-----	--	--	--	--	--	--	--	--	80	200
Vaucluse loamy sand, 10 to 15 percent slopes, eroded	---	-----	--	--	--	--	--	--	--	--	---	---
Vaucluse loamy sand, 15 to 20 percent slopes, eroded	--	-----	--	--	--	--	--	--	--	--	---	---
Vaucluse loamy sand, thick surface, 2 to 6 percent slopes	200	350	15	30	10	20	20	40	10	20	90	200
Vaucluse loamy sand, thick surface, 6 to 10 percent slopes	160	300	12	25	10	20	20	40	10	20	90	200
Vaucluse loamy sand, thick surface, 10 to 15 percent slopes	---	-----	--	--	--	--	--	--	--	--	80	170
Wehadkee and Chewacla silt loams (Wehadkee part)	---	-----	--	--	--	--	--	--	--	--	---	240

1/ Cow-acre-days is the number of days in a year that one animal unit (one cow, steer, or horse; five hogs; seven sheep; or seven goats) can graze 1 acre without injury to the pasture.

TABLE 2.--Suitability ratings

[Number 1 means soil is well suited; number 2 means soil is suited; number

Soil name	Row crops						Truck			
	Corn	Cotton	Grain sorghum	Peanuts	Soybeans	Tobacco	Beans, green	Cantaloupes	Cucumbers	Leafy vegetables
Caroline loamy sand, 2 to 6 percent slopes	3	2	2	3	2	3	4	3	3	3
Caroline loamy sand, 2 to 6 percent slopes, eroded	3	2	2	3	2	3	4	3	3	3
Caroline loamy sand, 6 to 10 percent slopes	3	3	2	3	2	3	4	3	3	3
Caroline loamy sand, 6 to 10 percent slopes, eroded	3	3	2	3	2	4	4	3	3	3
Caroline loamy sand, 10 to 15 percent slopes	4	3	2	3	2	4	4	4	4	4
Caroline loamy sand, 10 to 15 percent slopes, eroded	4	4	3	4	3	4	4	4	4	4
Caroline loamy sand, 15 to 25 percent slopes, eroded	4	4	4	4	4	4	4	4	4	4
Caroline loamy sand, thick surface, 2 to 6 percent slopes	3	2	2	3	2	3	4	3	3	3
Caroline loamy sand, thick surface, 6 to 10 percent slopes	3	3	2	3	2	3	4	3	3	3
Caroline sandy clay loam, 6 to 10 percent slopes, severely eroded	4	4	4	4	4	4	4	4	4	4
Chewacla silt loam	2	4	2	4	2	4	2	4	3	3
Congaree silt loam	1	4	1	3	2	4	1	3	1	2
Congaree-Chewacla silt loams	2	4	2	4	2	4	2	3	2	3
Coxville sandy loam	2	3	2	4	2	3	2	4	3	3
Dunbar sandy loam	1	2	1	4	1	2	2	4	3	2
Eustis loamy sand, 0 to 6 percent slopes	3	3	3	3	3	3	4	3	4	3
Eustis loamy sand, 6 to 10 percent slopes	4	3	4	3	4	4	4	3	4	4
Eustis loamy sand, 10 to 15 percent slopes	4	4	4	4	4	4	4	4	4	4
Eustis sand, 0 to 6 percent slopes	3	3	3	3	3	3	4	3	4	3
Eustis sand, 6 to 10 percent slopes	4	4	4	3	3	4	4	3	4	4
Eustis sand, 10 to 15 percent slopes	4	4	4	4	4	4	4	4	4	4
Faceville loamy fine sand, 0 to 2 percent slopes	1	1	1	1	1	2	3	1	2	3
Faceville loamy fine sand, 2 to 6 percent slopes	1	1	1	1	1	2	3	1	2	3
Faceville loamy fine sand, 2 to 6 percent slopes, eroded	1	1	1	2	1	3	3	2	2	3
Faceville loamy fine sand, 6 to 10 percent slopes, eroded	3	2	3	4	2	4	3	3	3	4
Faceville and Ruston soils, 0 to 2 percent slopes	1	1	1	1	1	2	3	1	2	3
Faceville and Ruston soils, 2 to 6 percent slopes	1	1	1	1	1	2	3	1	2	3
Faceville and Ruston soils, 2 to 6 percent slopes, eroded	1	1	1	2	1	3	3	2	2	3
Faceville and Ruston soils, 6 to 10 percent slopes	3	2	3	4	2	4	3	3	3	4
Faceville and Ruston soils, 6 to 10 percent slopes, eroded	3	3	3	4	3	4	4	4	4	4
Faceville and Ruston soils, 10 to 15 percent slopes, eroded	4	4	4	4	4	4	4	4	4	4
Goldsboro loamy sand	1	1	1	2	1	1	2	2	2	2
Grady loam	2	3	2	4	2	4	2	4	3	3
Grady sandy loam	2	3	2	4	2	4	2	4	3	3
Greenville sandy loam, 0 to 2 percent slopes	1	1	1	1	1	3	3	2	2	2
Greenville sandy loam, 2 to 6 percent slopes	1	1	1	1	1	3	3	2	2	2
Greenville sandy loam, 2 to 6 percent slopes, eroded	2	2	1	2	1	4	3	3	3	3
Greenville sandy loam, 6 to 10 percent slopes, eroded	3	2	2	3	2	4	4	4	4	4
Izagora sandy loam, gray variant	2	2	2	3	2	3	2	3	3	3
Kalmia loamy sand, thick surface	3	2	2	2	2	3	4	3	3	3
Killian loamy sand, 2 to 6 percent slopes	2	2	2	3	2	3	3	2	3	3
Killian loamy sand, 6 to 10 percent slopes	3	3	2	3	2	4	3	3	3	4
Killian loamy sand, 6 to 10 percent slopes, eroded	3	3	3	4	3	4	4	4	4	4
Killian loamy sand, 10 to 15 percent slopes	4	4	3	4	3	4	4	4	4	4

of soils for specified crops

3 means soil is not well suited; number 4 means soil is not suited]

crops						Small grains				Forage and grazing crops						Orchards and vineyards			Wild-life crops		Legumes					
Okra	Peppers	Potatoes and cabbage	Sweetpotatoes	Tomatoes	Watermellons	Barley	Oats	Rye	Wheat	Bahiagrass	Bermudagrass	Dallisgrass	Fescue, tall	Millet 1/	Ryegrass	Grapes	Peaches	Pecans	Lespedeza, bicolor	Millet, browntop	Alfalfa	Clover, crimson	Clover, white	Cowpeas	Lespedeza, annual	Lespedeza, sericea	Lupine
3	3	3	3	3	3	3	2	2	3	2	2	4	4	2	2	3	3	3	2	2	4	3	4	2	3	2	3
3	3	3	3	3	3	3	2	2	3	2	2	4	4	2	2	3	3	3	2	2	4	3	4	2	3	2	3
3	3	4	4	3	3	3	2	2	3	2	2	4	4	2	2	3	3	3	2	2	4	3	4	2	3	2	3
3	3	4	4	3	3	3	2	2	3	2	2	4	4	2	2	3	3	3	2	2	4	3	4	2	3	2	3
4	4	4	4	4	4	4	3	3	4	3	3	4	4	3	3	4	4	4	3	3	4	4	4	3	4	3	4
4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2	3	3	3	3	3	3	2	2	3	2	2	4	4	2	2	3	3	3	2	2	4	3	4	3	4	2	3
3	3	3	3	3	3	3	2	2	3	2	2	4	4	2	2	3	3	3	2	2	4	3	4	3	4	2	3
4	4	4	4	3	4	4	3	3	4	3	3	4	4	3	3	4	4	4	3	3	4	4	4	3	4	3	4
4	4	3	3	2	4	3	2	2	3	2	2	3	3	2	2	4	4	4	4	3	4	4	4	4	4	4	4
1	3	2	1	3	3	2	1	1	2	1	1	2	1	1	1	4	4	2	2	1	4	2	1	1	1	1	4
4	4	4	4	4	4	4	3	3	4	2	2	1	1	1	2	4	4	4	2	2	4	2	1	1	2	1	4
3	4	3	2	4	4	4	2	3	3	2	3	2	3	2	2	3	4	4	4	4	4	3	1	3	4	2	4
2	3	2	4	2	2	3	2	2	4	2	2	4	4	2	2	4	4	3	4	4	4	4	2	4	4	3	4
3	3	4	3	4	2	3	3	3	4	3	3	4	4	3	3	4	4	4	4	4	4	4	3	4	4	4	4
4	4	4	3	4	3	4	4	4	4	3	3	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4
2	1	3	2	2	2	1	1	1	1	1	1	3	3	1	1	1	1	1	1	1	3	1	3	1	2	1	1
2	1	3	2	2	2	1	1	1	1	1	1	3	3	1	1	1	1	1	1	1	3	2	3	1	2	1	2
3	1	3	2	2	3	1	1	1	2	1	1	4	4	1	1	2	2	1	1	2	4	3	4	2	3	1	3
3	3	4	3	3	4	3	2	2	3	2	2	4	4	2	2	2	2	2	1	2	4	3	4	2	3	1	3
2	1	3	2	2	2	1	1	1	2	1	1	3	3	1	1	1	1	1	1	1	3	1	3	1	2	1	1
2	1	3	2	2	2	1	1	1	2	1	1	3	3	1	1	1	1	1	1	1	3	1	3	1	2	1	1
3	1	3	3	2	3	1	1	1	2	1	1	4	4	1	1	1	1	1	1	1	4	2	4	1	3	1	2
3	3	4	4	3	4	3	2	2	3	2	2	4	4	2	2	2	2	2	1	2	4	3	4	2	3	1	3
4	4	4	4	4	4	4	3	3	4	3	3	4	4	3	3	3	4	4	2	3	4	4	4	3	4	2	4
4	4	4	4	4	4	4	3	3	4	3	3	4	4	3	3	4	4	4	2	3	4	4	4	3	4	2	4
1	1	2	2	2	3	2	1	2	2	1	1	3	4	1	1	2	4	2	4	4	4	2	2	2	3	1	3
2	3	3	4	4	4	4	2	2	3	2	3	2	3	2	2	4	4	4	4	4	4	2	1	3	4	2	4
2	3	3	4	4	4	4	2	2	3	2	3	2	3	2	2	4	4	4	4	4	4	2	1	3	4	2	4
2	1	3	2	2	2	1	1	1	1	1	1	3	3	1	1	1	1	1	1	1	2	1	3	1	3	1	4
2	1	3	2	2	2	1	1	1	1	1	1	3	3	1	1	1	1	1	1	1	2	1	3	1	3	1	4
3	2	4	3	3	3	2	2	2	3	2	2	4	4	2	2	2	2	2	1	1	3	2	4	2	3	1	4
4	4	4	4	3	4	4	3	3	4	3	3	4	4	3	3	3	3	3	2	2	4	3	4	3	4	2	4
2	3	4	4	3	3	3	2	2	3	2	2	4	4	2	2	3	4	3	2	2	4	3	4	3	4	2	3
3	3	4	4	3	3	3	2	2	3	2	2	4	4	2	2	3	4	3	2	2	4	3	4	3	4	2	3
4	4	4	4	4	3	4	3	3	4	3	3	4	4	3	3	4	4	4	3	3	4	4	4	4	4	3	4
4	4	4	4	4	3	3	3	3	4	3	3	4	4	3	3	4	4	4	3	3	4	4	4	4	4	3	4

TABLE 2.--Suitability ratings

[Number 1 means soil is well suited; number 2 means soil is suited; number

Soil name	Row crops						Truck			
	Corn	Cotton	Grain sorghum	Peanuts	Soybeans	Tobacco	Beans, green	Cantaloupes	Cucumbers	Leafy vegetables
Killian loamy sand, thick surface, 2 to 6 percent slopes	3	2	2	3	3	3	4	3	3	3
Killian loamy sand, thick surface, 6 to 10 percent slopes	3	3	2	3	3	4	4	3	4	4
Lakeland loamy sand	3	2	3	2	3	3	4	3	3	3
Lakeland sand, 0 to 6 percent slopes	3	3	3	3	3	3	4	3	4	3
Lakeland sand, 6 to 10 percent slopes	4	3	3	3	3	4	4	3	4	4
Lakeland sand, 10 to 15 percent slopes	4	4	4	4	4	4	4	4	4	4
Lakeland sand, shallow, 0 to 2 percent slopes	3	2	3	2	3	3	4	3	3	3
Lakeland sand, shallow, 2 to 6 percent slopes	3	2	3	2	3	3	4	3	3	4
Lakeland sand, shallow, 6 to 10 percent slopes	4	3	3	3	3	4	4	4	4	4
Lakeland sand, shallow, 10 to 15 percent slopes	4	4	4	4	4	4	4	4	4	4
Local alluvial land	1	2	1	3	1	3	1	2	2	1
Lychburg sandy loam	1	2	1	4	1	1	1	4	2	2
Magnolia sandy clay loam, 2 to 6 percent slopes, severely eroded	3	3	3	4	3	4	4	4	4	4
Magnolia sandy clay loam, 6 to 10 percent slopes, severely eroded	4	4	3	4	3	4	4	4	4	4
Magnolia sandy clay loam, 10 to 15 percent slopes, severely eroded	4	4	4	4	4	4	4	4	4	4
Magnolia sandy loam, 0 to 2 percent slopes	1	1	1	1	1	2	3	1	2	2
Magnolia sandy loam, 2 to 6 percent slopes	1	1	1	2	1	3	3	1	2	2
Magnolia sandy loam, 2 to 6 percent slopes, eroded	2	2	2	3	2	4	4	4	4	4
Magnolia sandy loam, 6 to 10 percent slopes	2	2	2	4	3	4	4	4	4	4
Magnolia sandy loam, 6 to 10 percent slopes, eroded	3	2	2	3	2	4	4	4	4	4
Magnolia sandy loam, 10 to 15 percent slopes, eroded	4	4	3	4	3	4	4	4	4	4
Marlboro fine sandy loam, 0 to 2 percent slopes	1	1	1	1	1	1	2	1	2	2
Marlboro fine sandy loam, 2 to 6 percent slopes	1	1	1	1	1	2	2	1	2	2
Norfolk loamy sand, 0 to 2 percent slopes	1	1	1	1	1	1	3	1	2	2
Norfolk loamy sand, 2 to 6 percent slopes	1	1	1	1	1	1	3	2	2	3
Norfolk loamy sand, 2 to 6 percent slopes, eroded	2	2	2	2	1	2	4	3	3	4
Norfolk loamy sand, 6 to 10 percent slopes	3	3	3	4	2	3	4	3	3	4
Norfolk loamy sand, thick surface, 0 to 2 percent slopes	2	2	2	2	2	2	3	1	2	3
Norfolk loamy sand, thick surface, 2 to 6 percent slopes	3	2	3	2	3	3	3	1	2	3
Norfolk loamy sand, thick surface, 6 to 10 percent slopes	4	3	4	2	2	4	4	2	3	4
Norfolk loamy sand, thin solum, 2 to 6 percent slopes	1	1	1	1	1	1	3	2	2	3
Norfolk loamy sand, thin solum, 2 to 6 percent slopes, eroded	2	2	2	3	1	2	4	3	3	4
Norfolk loamy sand, thin solum, 6 to 10 percent slopes	3	3	3	3	2	3	4	3	3	4
Okenee loam	2	4	2	4	2	4	2	4	2	2
Orangeburg loamy sand, 0 to 2 percent slopes	1	1	1	1	1	2	3	1	2	2
Orangeburg loamy sand, 2 to 6 percent slopes	1	1	1	1	1	2	3	1	2	2
Orangeburg loamy sand, 2 to 6 percent slopes, eroded	2	1	1	2	1	3	3	2	3	3
Orangeburg loamy sand, 6 to 10 percent slopes	3	2	2	2	2	4	4	3	3	4
Orangeburg loamy sand, 6 to 10 percent slopes, eroded	3	2	2	3	2	4	4	3	3	4
Orangeburg loamy sand, 10 to 15 percent slopes, eroded	4	4	3	4	3	4	4	4	4	4
Plummer-Rutlege loamy fine sands (Plummer part)	4	4	4	4	4	4	4	4	4	4
Portsmouth loam	2	4	2	4	2	4	2	4	2	2
Rains sandy loam	3	4	3	4	3	4	3	4	3	3

of soils for specified crops--Continued

3 means soil is not well suited; number 4 means soil is not suited]

crops						Small grains				Forage and grazing crops						Orchards and vineyards			Wild-life crops		Legumes					
Okra	Peppers	Potatoes and cabbage	Sweetpotatoes	Tomatoes	Watermelons	Barley	Oats	Rye	Wheat	Bahiagrass	Bermudagrass	Dallisgrass	Fescue, tall	Millet 1/	Ryegrass	Grapes	Peaches	Pecans	Lespedeza, bicolor	Millet, browntop	Alfalfa	Clover, crimson	Clover, white	Cowpeas	Lespedeza, annual	Lespedeza, sericea	Lupine
3	3	3	2	3	2	3	3	2	3	2	2	4	4	3	3	3	3	3	2	2	4	3	4	3	4	2	4
3	4	4	2	3	1	4	3	2	3	2	2	4	4	3	3	3	2	4	2	2	4	3	4	3	4	3	4
3	4	4	3	4	2	4	3	2	4	2	2	4	4	3	3	3	2	4	2	2	4	4	4	3	4	2	2
4	4	4	4	4	3	4	3	3	4	2	2	4	4	4	3	3	2	4	2	2	4	4	4	3	4	3	3
3	4	4	2	3	1	4	3	2	3	2	2	4	4	3	3	3	2	4	2	2	4	3	4	2	4	2	2
4	4	4	3	4	2	4	3	2	4	2	2	4	4	3	3	3	2	4	2	2	4	3	4	3	4	2	3
4	4	4	4	4	3	4	3	2	4	2	2	4	4	3	3	3	2	4	3	2	4	4	4	3	4	3	4
1	2	1	3	2	3	2	1	2	2	1	1	2	2	1	1	3	4	4	4	1	4	2	2	2	1	2	2
1	2	2	3	3	3	3	2	2	3	1	1	2	3	1	2	4	4	4	4	1	4	3	2	2	1	4	3
4	4	4	4	4	4	4	3	3	3	3	3	4	4	3	3	3	4	4	3	3	4	3	3	3	4	3	4
4	4	4	4	4	4	4	3	3	4	3	3	4	4	4	3	4	4	4	4	3	4	3	4	3	4	3	4
4	4	4	4	4	4	4	3	3	4	3	3	4	4	4	3	4	4	4	4	3	4	3	4	3	4	3	4
2	1	3	2	2	2	1	1	1	1	1	1	3	3	1	1	1	1	1	1	1	2	1	3	1	2	1	2
2	2	3	3	2	3	1	1	1	1	1	1	4	4	1	1	1	1	1	1	1	2	2	4	1	2	1	2
2	1	3	1	1	1	1	1	1	2	1	1	3	4	1	1	1	1	1	1	1	3	1	4	1	3	1	1
3	2	3	1	1	1	1	1	1	2	1	1	4	4	1	1	1	1	1	1	1	4	2	4	1	3	1	1
3	3	4	2	1	2	1	1	1	2	1	1	4	4	2	2	2	1	1	1	2	4	3	4	1	3	1	2
2	2	3	1	2	1	2	2	2	2	2	2	4	4	2	2	2	2	1	1	2	4	2	4	2	4	2	2
2	2	3	1	3	1	2	2	2	3	2	2	4	4	2	2	2	2	1	1	2	4	3	4	2	4	2	3
3	3	4	2	4	2	3	2	2	4	2	2	4	4	2	2	2	2	2	1	2	4	4	4	2	4	2	4
3	2	3	1	1	1	1	1	1	2	1	1	4	4	1	1	1	1	1	1	1	4	2	4	1	3	1	1
3	3	4	2	1	2	1	1	1	2	1	1	4	4	1	1	1	1	1	1	2	4	3	4	1	3	1	2
3	3	4	3	3	2	1	2	2	3	1	1	4	4	2	2	2	1	1	1	2	4	3	4	2	4	1	4
3	4	2	4	4	4	4	2	3	4	2	3	2	3	2	2	4	4	4	4	1	4	4	4	3	1	4	4
3	1	3	1	1	1	1	1	1	1	1	1	3	4	1	1	1	1	1	1	1	3	1	3	1	3	1	3
3	1	4	1	2	1	1	1	1	1	1	1	4	4	1	1	1	1	1	1	1	3	2	4	1	3	1	3
3	2	4	3	3	3	2	1	1	2	1	1	4	4	1	1	2	1	1	1	1	4	3	4	1	3	1	4
3	2	4	3	3	4	2	1	1	2	1	1	4	4	2	2	2	1	1	1	1	4	3	4	1	3	1	4
4	3	4	4	4	4	3	2	2	3	2	2	4	4	3	3	4	3	3	2	2	4	4	4	2	4	2	4
4	4	4	4	4	4	4	3	3	4	3	3	4	4	4	3	4	4	4	3	3	4	4	4	3	4	3	4
4	3	2	4	4	4	4	3	3	4	3	3	1	3	2	2	4	4	4	4	2	4	3	4	3	1	4	4
3	4	3	4	4	4	4	4	4	4	2	2	2	4	3	3	4	4	4	4	2	4	4	4	4	2	4	4

TABLE 2.--Suitability ratings

[Number 1 means soil is well suited; number 2 means soil is suited; number

Soil name	Row crops						Truck			
	Corn	Cotton	Grain sorghum	Peanuts	Soybeans	Tobacco	Beans, green	Cantaloupes	Cucumbers	Leafy vegetables
Ruston loamy sand, thick surface, 0 to 2 percent slopes	2	2	2	2	2	2	3	1	2	3
Ruston loamy sand, thick surface, 2 to 6 percent slopes	2	2	2	2	2	3	3	1	2	3
Ruston loamy sand, thick surface, 6 to 10 percent slopes	4	3	4	2	3	4	4	2	3	4
Ruston loamy sand, thick surface, 10 to 15 percent slopes	4	4	4	3	3	4	4	4	4	4
Sandy and clayey land, sloping	4	4	4	4	4	4	4	4	4	4
Sandy and clayey land, moderately steep	4	4	4	4	4	4	4	4	4	4
Swamp	4	4	4	4	4	4	4	4	4	4
Tifton sandy loam, 2 to 6 percent slopes	1	1	1	1	1	2	3	1	2	2
Vaucluse loamy sand, 2 to 6 percent slopes	3	2	2	3	3	4	4	3	3	3
Vaucluse loamy sand, 2 to 6 percent slopes, eroded	3	3	3	4	3	4	4	3	3	4
Vaucluse loamy sand, 6 to 10 percent slopes	4	3	3	4	3	4	4	4	4	4
Vaucluse loamy sand, 6 to 10 percent slopes, eroded	4	4	4	4	3	4	4	4	4	4
Vaucluse loamy sand, 10 to 15 percent slopes	4	3	4	4	3	4	4	4	4	4
Vaucluse loamy sand, 10 to 15 percent slopes, eroded	4	4	4	4	4	4	4	4	4	4
Vaucluse loamy sand, 15 to 20 percent slopes, eroded	4	4	4	4	4	4	4	4	4	4
Vaucluse loamy sand, thick surface, 2 to 6 percent slopes	3	3	3	3	3	3	4	3	4	4
Vaucluse loamy sand, thick surface, 6 to 10 percent slopes	3	3	3	3	3	4	4	3	4	4
Vaucluse loamy sand, thick surface, 10 to 15 percent slopes	4	3	4	4	4	4	4	4	4	4
Wehadkee and Chewacla silt loams (Wehadkee part)	3	4	4	4	3	4	4	4	4	3

1/ Starr, pearl, German, and browntop millets.

of soils for specified crops--Continued

3 means soil is not well suited; number 4 means soil is not suited]

crops						Small grains				Forage and grazing crops						Orchards and vineyards			Wild-life crops		Legumes						
Okra	Peppers	Potatoes and cabbage	Sweet potatoes	Tomatoes	Watermelons	Barley	Oats	Rye	Wheat	Bahiagrass	Bermudagrass	Dallisgrass	Fescue, tall	Millet 1/	Ryegrass	Grapes	Peaches	Pecans	Lespedeza, bicolor	Millet, browntop	Alfalfa	Clover, crimson	Clover, white	Cowpeas	Lespedeza, annual	Lespedeza, sericea	Lupine
2	2	3	1	2	1	2	2	2	2	2	2	4	4	2	2	2	2	1	1	2	4	2	4	2	4	2	2
2	2	3	1	3	1	2	2	2	2	2	2	4	4	2	2	2	2	1	1	2	4	2	4	2	4	2	2
3	3	4	2	4	2	3	2	2	2	2	2	4	4	2	2	2	3	2	1	2	4	2	4	3	4	2	4
4	4	4	4	4	3	4	3	3	4	3	3	4	4	3	3	4	4	4	2	3	4	4	4	4	4	2	4
4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4	4	4	3	4	4	4	4	4	4	3	4
4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2	1	3	1	1	1	1	1	1	1	1	1	3	4	1	1	1	1	1	1	1	3	1	4	1	3	1	1
3	3	4	2	3	2	3	3	2	3	2	2	4	4	3	2	3	3	3	2	2	4	3	4	2	4	2	4
3	4	4	3	3	3	4	3	3	4	2	2	4	4	3	2	3	3	3	2	3	4	3	4	2	4	2	4
4	4	4	3	4	3	4	3	3	4	2	2	4	4	3	3	4	4	3	2	3	4	4	4	2	4	3	4
4	4	4	4	4	4	4	3	3	4	3	3	4	4	3	3	4	4	3	3	3	4	4	4	3	4	3	4
4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	3	4	4	3	3	4	4	4	4	3	4	3	4
4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	3	4	4	4	3	4	4	4	4	4	4	3	4
4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	3	4	4	4	3	4	4	4	4	4	4	3	4
4	4	4	3	3	4	4	3	3	4	2	2	4	4	3	3	3	3	3	2	3	4	4	4	2	4	2	4
4	4	4	4	4	3	4	3	3	4	2	2	4	4	3	3	3	3	3	2	3	4	4	4	3	4	2	4
4	4	4	4	4	4	4	3	3	4	3	3	4	4	3	3	4	4	4	3	4	4	4	4	4	4	3	4
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

fertilizer, lime, and manure in appropriate amounts; (3) use suitable tillage methods; (4) return organic matter to the soils; (5) control water adequately; (6) maintain or improve the productivity and tilth of the soils; and (7) conserve soil material, plant nutrients, and soil moisture.

The yields in columns B are based largely upon estimates made by Soil Conservation Service agronomists, work unit conservationists, and others who have had experience with the soils and crops of the county. These men considered the known deficiencies of the soils and estimated how much the yields might increase if the deficiencies were corrected within practical limits. These limits cannot be defined, nor can the response to good management be precisely predicted. By comparing yields in columns B with those in columns A, however, one may gain some idea of the response that a soil can make to good management. On practically all soils of the county, yields are increased by more intensive management than that ordinarily practiced.

RELATIVE SUITABILITY OF THE SOILS FOR CROPS

In table 2 the degree of suitability of a soil for a named crop is expressed by index numbers. Number 1 indicates that the soil is well suited; numbers 2 and 3, that it is progressively less well suited; and number 4, that it is not at all suited. Not listed in table 2 are Borrow pits, Mixed alluvial land, and Myatt loamy sand.

Soils that have index number 1 are the most desirable for the named crop. For these soils, yields are more dependable and hazards are less than for other soils in the county, and the least intensive management is required. Soils having index number 2 are suited to the crop, but they are materially limited by excess moisture or a lack of moisture, by a shallow root zone, by low fertility, or by some other factor. Index number 3 indicates that a given crop cannot be expected to produce good yields on the soil without intensive management practices that generally do not pay. Number 4 indicates that the soil is not suited to the named crop.

Plan the use of all of the soils, regardless of their crop suitability rating, according to their capabilities.

Use of Soils as Woodland [2]

The original forest that covered much of Calhoun County consisted mainly of pine, oak, and hickory on the uplands and of cypress and bottom-land hardwoods on the flood plains and in other alluvial areas. Pine has invaded many areas that were cleared of their native trees, cultivated, and later abandoned. The Sandhills have remained in forest, mainly because they are not generally suitable for cultivation. Virgin forest provided materials for naval stores and logging industries. On upland sites that originally were mostly in pine, cutting practices and recent fire protection have favored hardwoods.

The 1958 forest survey of South Carolina (6)[3] showed that 50.7 percent of the total land area was still woodland. About 99 percent of the woodland is privately owned, and 1 percent is publicly owned.

The forests in Calhoun County are classified in the following forest-type groups of the Society of American Foresters (12): longleaf pine, loblolly pine, cypress-tupelo, and bottom-land hardwoods. Many forest types are included in these forest-type groups. Generally, longleaf pine and scrub oaks dominate in the droughty Sandhills; loblolly pine and longleaf pine dominate on moist, well-drained uplands; cypress and tupelo dominate on soils in alluvium that are poorly drained or very poorly drained and have excessive surface water; and bottom-land hardwoods dominate on well-drained to poorly drained soils in alluvium.

The wood-processing plants in the county are one stationary sawmill and two portable sawmills. Pulpwood is loaded at local railroad sidings for shipment outside the county.

Interest in woodland conservation is increasing among the farmers in the county. Since 1929 approximately 13 million trees have been planted in the county on 13,000 acres. During the 1960-61 planting season more than 2-1/4 million trees were planted. The five tree farms in the county totaled 4,133 acres.

Soil characteristics that affect trees

The soils in Calhoun County differ greatly in their suitability for trees, and in the combinations of species that grow on them.

Some soils are suited to hardwoods and others to pine. Pine probably should not be grown on some of the soils that are better suited to hardwoods. In other places pine may be more profitable than hardwoods, even though controlling the competing hardwoods may be costly. The soils of the county differ in their suitability for trees because they are at different elevations and positions, are of different kinds, and therefore have different characteristics. The most important soil characteristics that affect tree growth are those related to their ability to supply moisture and to provide growing space for roots. Among these characteristics are the thickness of the surface layer and subsoil, the supply of plant nutrients, the texture and consistence of the soil material, the depth to impermeable material, and the depth to the water table. Drainage is also important (2) and depends on some of these characteristics and on slope. Aeration should be good so that tree roots get enough air.

Woodland suitability groups

To assist people who manage woodland, the soils of the county have been placed in 14 woodland suitability groups. Each group is made up of soils that produce similar kinds of woodcrops, that need similar management to produce these crops, and that have about the same potential productivity.

[2] This section was written by GEORGE E. SMITH, Jr., woodland conservationist, and CARL B. LAWRENCE, soil scientist, Soil Conservation Service.

[3] Underscored numbers in parentheses refer to Literature Cited, page 132.

These groupings have been made by evaluating tree-growth performance and the soil properties that affect growth and management of trees.

Listed in table 3, and later described in the text, are the 14 woodland suitability groups in the county. The one mapping unit not placed in a suitability group is Borrow pits. The potential productivity of selected trees is expressed as a site index in table 3 and in the text. The site index for a given soil is the height, in feet, that a specified kind of tree will reach in 50 years. Each site index shown in table 3 is an average for all the soils in the woodland suitability group. These indexes are based on observations made by the Soil Conservation Service and the South Carolina State Commission of Forestry. Ellerbe and Smith[4] have summarized site indexes and interpretations for soil mapping units on the Coastal Plain of South Carolina.

Also in table 3 for each woodland suitability group are ratings for hazards and limitations that affect management. The hazards and limitations rated are plant competition, seedling mortality, equipment limitations, erosion hazard, and windthrow hazard. These ratings are expressed in relative terms--slight, moderate, or severe--and are explained in the following paragraphs.

Plant competition, or brush encroachment, is the invasion or growth of undesirable species when openings are made in the canopy. Competition is slight when competing plants do not prevent the natural regeneration or the early growth of desirable species, or do not interfere with the growth of planted seedlings. Competition is moderate if competing plants delay natural or artificial regeneration but do not prevent the growth of a fully stocked, normal stand. Competition is severe if competing plants prevent adequate natural restocking or natural regeneration, unless the site is intensively prepared and maintained by weeding and other practices.

Seedling mortality refers to the mortality of naturally occurring or planted tree seedlings as influenced by the kinds of soil or topography when plant competition is not a limiting factor. The rating for naturally occurring seedlings is slight if mortality is expected to be between 0 to 25 percent; moderate if between 25 and 50 percent; and severe if more than 50 percent. If seedling mortality is severe, adequate restocking will require much replanting, special seedbed preparation, and superior planting methods.

Equipment limitations vary according to slope range, soil wetness, and other factors that restrict or prohibit the use of equipment commonly used in tending and harvesting trees. Equipment limitations are slight if the kind of equipment and its season of use are not restricted. Limitations are moderate if the kind or operation of equipment is limited by one or more of the following: slope, stones, or obstructions; seasonal wetness; physical soil characteristics; and possible injury to tree roots, soil structure, or soil stability. Limitations are severe if special equipment is needed and its use is severely restricted by one or more of the factors listed for "moderate," and by safety in operation.

Erosion hazard refers to potential soil erosion that may occur where soil is managed according to usual practices. Erosion is slight if the problems of erosion control are not important. It is moderate if some attention must be given to prevent unnecessary soil erosion. The erosion hazard is severe if intensive treatment and the operation of specialized equipment must be planned to minimize soil erosion.

Windthrow hazard is the danger of trees being blown over the by wind. It varies according to shallowness, stoniness, droughtiness, wetness, and other soil characteristics; kinds of trees; and thinning, cutting, leaving protective borders, and other forestry practices used to minimize tree losses. Windthrow hazard is slight if normally no trees are blown down by the wind. It is moderate if some trees are expected to blow down when the soil is excessively wet and the wind is high. Windthrow hazard is severe if many trees are expected to blow down when the soils are excessively wet and the wind is moderate or high.

WOODLAND SUITABILITY GROUP 1

In this group are deep, loose, excessively drained soils on uplands. These soils have rapid infiltration, very rapid permeability, and very low available moisture capacity. Organic matter and natural fertility are low. The soils are--

Eustis sand, 0 to 6 percent slopes.
Eustis sand, 6 to 10 percent slopes.
Eustis sand, 10 to 15 percent slopes.
Lakeland sand, 0 to 6 percent slopes.
Lakeland sand, 6 to 10 percent slopes.
Lakeland sand, 10 to 15 percent slopes.

On these soils longleaf, slash, and loblolly pines are preferred for sawtimber and pulpwood. Though not so well suited for sawtimber, shortleaf pine can be grown for pulpwood. All four species of pine can produce poles and piling of medium or short length.

Arizona cypress and redcedar are suitable as Christmas trees and as an understory in windbreaks. Laurel cherry is suitable as an understory in both forest stands and in windbreaks. The important commercial hardwoods are not suited to these soils, but persimmon, hickory, gum, and oak provide food for wildlife. Acorns are scarce because of the low moisture supply.

On slopes of less than 6 percent, the site index may be more than that listed in table 3 if the moisture supply is good. On dry slopes of more than 6 percent, the index may be 10 less than the average. For well-stocked, unmanaged stands 50 years old, the approximate average annual growth (Scribner) in board feet per acre is 400 for loblolly pine, 190 for longleaf pine, 120 for shortleaf pine, and 385 for slash pine. In the Sandhills the average

Soil Survey Interpretations for Woodland Conservation, South Carolina Progress Report, Coastal Plain and Sandhills, 1961. U.S. Dept. Agr., SCS, Columbia, S.C. [processed] 98 pp., illus.

TABLE 3.--Woodland suitability groups of soils, their potential productivity, and

[Dashed lines indicate that tree is not

Group and description	Map symbols	Potential productivity (site index at 50 years) 1/			
		Loblolly pine	Longleaf pine	Shortleaf pine	Slash pine 2/
Group 1: Deep, loose, nearly level to strongly sloping sands with excessive drainage, very rapid permeability, and low available moisture capacity; on uplands.	EsB, EsC, EsD; LkB, LkC, LkD--------	78±7	67±5	53±7	78
Group 2: Deep, loose, nearly level to strongly sloping sands and loamy sands with excessive drainage, very rapid permeability, and low available moisture capacity.	EmB, EmC, EmD; La; LsA, LsB, LsC, LsD.	80±5	70±6	68±7	80
Group 3: Deep, nearly level to steep sandy loams and loamy sands with good drainage, moderate permeability, and medium to high available moisture capacity.	CaB, CaB2, CaC, CaC2, CaD, CaD2, CaE2; FaA, FaB, FaB2, FaC2; FrA, FrB, FrB2, FrC, FrC2, FrD2; Gb; GsA, GsB, GsB2, GsC2; KbB, KbC, KbC2; KbD; MgA, MgB, MgB2, MgC, MgC2, MgD2; MrA, MrB; NfA, NfB, NfB2, NfC; NtB, NtB2, NtC; OrA, OrB, OrB2, OrC, OrC2, OrD2; TfB.	84±5	71±7	69±9	84
Group 4: Deep, friable, nearly level to strongly sloping loamy sands with good drainage, moderate to slow permeability, and medium available moisture capacity.	CbB, CbC; Ka; KtB, KtC; NoA, NoB, NoC; RuA, RuB, RuC, RuD.	81±8	66±3	57	81
Group 5: Deep, nearly level silt loam and loamy sand with moderate to good drainage, moderately rapid permeability, and medium available moisture capacity.	Cn; Lv----------	99±2	72	67	99
Group 6: Deep, gently sloping to moderately steep loamy sands with good drainage, slow to very rapid permeability, and low available moisture capacity.	VaB, VaB2, VaC, VaC2, VaD, VaD2, VaE2; VtB; VtC; VtD.	63±7	55±8	51±4	63
Group 7: Nearly level sandy loams with somewhat poor to poor drainage, moderate to rapid permeability, and medium available moisture capacity.	Du; Iz; Ly; Ra----------	80±3	71±4	70	86

ratings for major limitations and hazards affecting management

generally suited to the soils in the group]

Hazards and limitations				
Plant competition	Seedling mortality	Equipment limitations	Erosion hazard	Windthrow hazard
Severe	Slight to severe	Slight	Slight	Slight.
Severe	Slight or moderate	Slight	Slight	Slight.
Severe	Slight	Slight or moderate	Moderate	Slight.
Severe	Slight or moderate	Slight	Slight	Slight.
Slight to severe	Slight to severe	Slight or moderate	Slight	Slight.
Slight to severe	Slight to severe	Slight to severe	Moderate or severe	Moderate or severe.
Severe	Slight or moderate	Moderate	Slight	Slight.

TABLE 3.--Woodland suitability groups of soils, their potential productivity, and

[Dashed lines indicate that tree is not

Group and description	Map symbols	Potential productivity (site index at 50 years) 1/			
		Loblolly pine	Longleaf pine	Shortleaf pine	Slash pine 2/
Group 8: Deep, nearly level silt loams with somewhat poor to moderately good drainage, moderate permeability, and high available moisture capacity.	Co; Ch	101±10	73	--------	101
Group 9: Nearly level sandy loams and loam with poor drainage, slow permeability, and medium available moisture capacity.	Cx; Gm; Gr	89±7	69±6	67	87
Group 10: Nearly level silt loams with poor drainage, slow permeability, and high available moisture capacity.	Wc	101±9	--------	--------	101
Group 11: Nearly level to depressional loams with very poor drainage, moderate permeability, and medium to high available moisture capacity.	Ok; Pt	98±5	68	--------	98
Group 12: Nearly level loamy sand and loamy fine sands with poor drainage, mainly rapid permeability, and low to medium available moisture capacity.	My; Pr	85±3	72±5	--------	85
Group 13: Deep, gently sloping to strongly sloping sandy clay loams with good drainage, moderate permeability, and medium available moisture capacity.	CcC3; MaB3, MaC3, MaD3	75±6	3/ 65	3/ 65	75
Group 14: Nearly level to moderately steep soils and swamp with somewhat poor to very poor drainage, slow to excessive permeability, and low to high available moisture capacity.	Mx; Sw; SaD, SaE	Varied			

1/ Standard deviations of the site index are not shown for tree if data on soils in group were not sufficient for determinations to be made. Site indexes for pond pine are omitted from this table but are included in the descriptions of woodland suitability groups 7, 9, 11, and 12.

ratings for major limitations and hazards affecting management--Continued

generally suited to the soils in the group]

Hazards and limitations				
Plant competition	Seedling mortality	Equipment limitations	Erosion hazard	Windthrow hazard
Slight to severe-----	Slight to severe-----	Moderate----------	Slight----------	Slight.
Moderate or severe---	Slight to severe-----	Moderate or severe---	Slight----------	Slight.
Slight to severe-----	Slight to severe-----	Severe----------	Slight----------	Slight.
Slight to severe-----	Moderate or severe---	Severe----------	Slight----------	Slight.
Slight to severe-----	Severe----------	Severe----------	Slight----------	Slight.
Severe----------	Slight or moderate---	Moderate----------	Moderate----------	Slight.

2/ Site indexes for slash pine are estimates based on measurements in other locations on soils similar to those in the groups. Slash pine is not native to Calhoun County but has been planted in the county extensively.

3/ Estimated.

site index is about 10 less than that shown, and yields are at least 25 percent less.

Plant competition is severe on these soils. Competing trees and other plants include blackjack, turkey, bluejack, post, water, live, and red oaks; hickory; sassafras; persimmon; sweetgum; blackgum; and wiregrass. Frequently, it is necessary to prepare sites before planting, or to eliminate or control competing plants by intensive practices that include furrowing, disking, land clearing or brush cutting (fig. 9), undercutting roots, burning, or applying herbicides.

Seedling mortality is slight to severe. It is caused by high surface temperature and a limited moisture supply in areas that are bare. On slopes of less than 6 percent, seedling mortality is moderate and 25 to 50 percent of the planted seedlings are expected to die. Light preparation of a seedbed insures adequate natural restocking.

On slopes that exceed 6 percent, seedling mortality ranges from slight to severe and depends on the supply of moisture. More than 50 percent of the planted seedlings are expected to die in rolling and hummocky areas because ridges and slopes are usually dry. Establishing adequate stands in these areas generally requires superior planting methods, high-quality seedlings, and replanting. Because available moisture is limited, natural regeneration cannot be relied on to produce well-stocked stands of preferred trees. Mortality is slight where there is seepage on the middle parts of slopes exceeding 6 percent. In these wet places, potential productivity is greater than in the drier sites because more water is supplied to trees.

Though the use of equipment is not generally restricted on these soils, light vehicles with rubber tires have poor traction on the loose, sandy soils. Also, heavy equipment requires extra power to operate because it is not well supported by the loose sand. In addition, the sands are abrasive, and the wear on the machines is more than normal.

Figure 9.--Lakeland sand that has been partly cleared of brush to reduce plant competition. Woodland suitability group 1.

Because the sand is deep, erosion is only a slight hazard. Furrowing on steep slopes should follow the contour to lessen soil movement and damage by silting to seedlings planted in the furrows. Because soil blowing may be severe in open areas during spring, windstrips may be needed to protect seedlings. Windthrow is generally not a hazard.

Damage from insects is severe on these soils. The Nantucket pine tip moth (Rhyacionia frustrana) attacks loblolly pine, and a root-rot fungus (Fomes annosus) damages conifers. Seedlings of susceptible trees are severely damaged by nematodes, which are present in some of these sandy soils, especially those that have been used for crops.

WOODLAND SUITABILITY GROUP 2

In this group are deep, loose, excessively drained sands and loamy sands that have sandy loam or sandy clay at a depth of 30 to 42 inches. These soils have high infiltration, very rapid permeability, and low available moisture capacity. Organic matter and natural fertility are low. The soils are--

Eustis loamy sand, 0 to 6 percent slopes.
Eustis loamy sand, 6 to 10 percent slopes.
Eustis loamy sand, 10 to 15 percent slopes.
Lakeland loamy sand.
Lakeland sand, shallow, 0 to 2 percent slopes.
Lakeland sand, shallow, 2 to 6 percent slopes.
Lakeland sand, shallow, 6 to 10 percent slopes.
Lakeland sand, shallow, 10 to 15 percent slopes.

On these soils slash, loblolly, and longleaf pines are preferred for pulpwood and sawlogs, but shortleaf pine is also suitable for those forest products. All four species of pine can produce poles and piling of medium length.

Arizona cypress and redcedar are suitable for Christmas trees and as an understory in windbreaks. Laurel cherry is also suitable in windbreaks. Commercial hardwoods do not generally grow well on these soils, but dogwood, persimmon, gum, oak, and hickory provide food for wildlife. Because the supply of moisture is good on the stream terraces, acorns are more abundant there than elsewhere.

Because these soils contain more fine material than the soils in suitability group 1 and have a better moisture supply, the site index is slightly higher. For well-stocked, unmanaged stands 50 years old, the approximate average annual growth (Scribner) in board feet per acre is 430 for loblolly pine, 225 for longleaf pine, 330 for shortleaf pine, and 350 for slash pine.

Plant competition on these soils is severe. Competing trees and other plants include blackjack, post, water, willow, white, live, red, turkey, and bluejack oaks; dogwood; sassafras; persimmon; blackgum; and wiregrass. Frequently it is necessary to prepare sites before planting, or to eliminate or control competing plants by intensive practices that include furrowing, disking, land clearing, brush cutting, undercutting roots, burning, or applying herbicides.

Seedling mortality is slight or moderate. Because the supply of moisture is low, natural restocking of abandoned fields or of open areas may not be adequate, and prompt planting may be needed to obtain well-stocked stands. Site preparation and good planting methods are beneficial. From 25 to 50 percent of the planted seedlings die, and some replanting may be needed to fill in large openings.

Equipment limitation is slight, but in dry periods light vehicles with small rubber tires may have poor traction on these soils. These sands are more abrasive than soils with finer texture.

The erosion hazard is slight on slopes of less than 10 percent and is moderate on slopes of more than 10 percent. Roads, firebreaks, and other construction should follow the contour where possible. Because severe soil blowing is likely in open areas during spring, windstrips may be needed to protect seedlings. Trees are not normally subject to windthrow.

Insects severely damage some trees on the soils of this group. The Nantucket pine tip moth attacks conifers. Nematodes sometimes occur in the sandy soils, especially in those that have been used for crops. The nematodes damage susceptible seedlings.

WOODLAND SUITABILITY GROUP 3

This group consists mainly of deep, well-drained, nearly level to strongly sloping sandy loams and loamy sands that have a sandy loam to sandy clay subsoil. These soils have moderate to rapid infiltration, moderate permeability, and medium to high available moisture capacity. The organic-matter content is medium, and natural fertility ranges from medium to high. The soils are--

Caroline loamy sand, 2 to 6 percent slopes.
Caroline loamy sand, 2 to 6 percent slopes, eroded.
Caroline loamy sand, 6 to 10 percent slopes.
Caroline loamy sand, 6 to 10 percent slopes, eroded.
Caroline loamy sand, 10 to 15 percent slopes.
Caroline loamy sand, 10 to 15 percent slopes, eroded.
Caroline loamy sand, 15 to 25 percent slopes, eroded.
Faceville loamy fine sand, 0 to 2 percent slopes.
Faceville loamy fine sand, 2 to 6 percent slopes.
Faceville loamy fine sand, 2 to 6 percent slopes, eroded.
Faceville loamy fine sand, 6 to 10 percent slopes, eroded.
Faceville and Ruston soils, 0 to 2 percent slopes.
Faceville and Ruston soils, 2 to 6 percent slopes.
Faceville and Ruston soils, 2 to 6 percent slopes, eroded.
Faceville and Ruston soils, 6 to 10 percent slopes.
Faceville and Ruston soils, 6 to 10 percent slopes, eroded.
Faceville and Ruston soils, 10 to 15 percent slopes, eroded.
Goldsboro loamy sand.
Greenville sandy loam, 0 to 2 percent slopes.
Greenville sandy loam, 2 to 6 percent slopes.
Greenville sandy loam, 2 to 6 percent slopes, eroded.
Greenville sandy loam, 6 to 10 percent slopes, eroded.
Killian loamy sand, 2 to 6 percent slopes.
Killian loamy sand, 6 to 10 percent slopes.
Killian loamy sand, 6 to 10 percent slopes, eroded.
Killian loamy sand, 10 to 15 percent slopes.
Magnolia sandy loam, 0 to 2 percent slopes.
Magnolia sandy loam, 2 to 6 percent slopes.
Magnolia sandy loam, 2 to 6 percent slopes, eroded.
Magnolia sandy loam, 6 to 10 percent slopes.
Magnolia sandy loam, 6 to 10 percent slopes, eroded.
Magnolia sandy loam, 10 to 15 percent slopes, eroded.
Marlboro fine sandy loam, 0 to 2 percent slopes.
Marlboro fine sandy loam, 2 to 6 percent slopes.
Norfolk loamy sand, 0 to 2 percent slopes.
Norfolk loamy sand, 2 to 6 percent slopes.
Norfolk loamy sand, 2 to 6 percent slopes, eroded.
Norfolk loamy sand, 6 to 10 percent slopes.
Norfolk loamy sand, thin solum, 2 to 6 percent slopes.
Norfolk loamy sand, thin solum, 2 to 6 percent slopes, eroded.
Norfolk loamy sand, thin solum, 6 to 10 percent slopes.
Orangeburg loamy sand, 0 to 2 percent slopes.
Orangeburg loamy sand, 2 to 6 percent slopes.
Orangeburg loamy sand, 2 to 6 percent slopes, eroded.
Orangeburg loamy sand, 6 to 10 percent slopes.
Orangeburg loamy sand, 6 to 10 percent slopes, eroded.
Orangeburg loamy sand, 10 to 15 percent slopes, eroded.
Tifton sandy loam, 2 to 6 percent slopes.

The Goldsboro soils are moderately well drained.

On all the soils in this group, loblolly and slash pines are preferred for sawtimber and pulpwood, but longleaf and shortleaf pines are also suitable for those forest products. All four species of pine can produce poles and piling of medium length. Black walnut is also suited to these soils but does not attain maximum height for this tree. Laurel cherry, redcedar, Arizona cypress, and ligustrum are suitable as an understory in windbreaks. Oak, hickory, black cherry, mulberry, and other trees produce food for wildlife.

If the moisture supply is good on slopes greater than 6 percent, the site index may be 10 more than that listed in table 3. For well-stocked, unmanaged stands 50 years old, the approximate average annual growth (Scribner) in board feet per acre is 475 for loblolly pine, 310 for longleaf pine, 345 for shortleaf pine, and 455 for slash pine.

Plant competition is severe on these soils. Competing plants include gum and hickory. Frequently it is necessary to prepare sites before planting seedings, or to eliminate or control competing

plants by intensive practices that include furrowing, land clearing, disking, burning, brush cutting, undercutting roots, or applying herbicides.

Seedling mortality is slight. If trees produce enough seeds and competing vegetation is controlled, a well-stocked stand regenerates naturally after the first planting.

The use of equipment on these soils is moderately restricted in eroded areas and on slopes of 10 percent or more. To prevent damage to the soil and tree roots in wet seasons, avoid using machines.

The erosion hazard is moderate. Operations that disturb protective cover should be avoided where possible. Roads and firebreaks should follow the contour so that the erosion hazard is lessened. Soil blowing occurs in large, open areas. Seedlings planted for windbreaks can be protected by overplanting such crops as Abruzzi rye. Windfall is generally slight.

Trees on the loamy sands in this group are especially susceptible to severe damage by nematodes and by the Nantucket pine tip moth. The moth attacks loblolly pine, and the nematodes attack seedlings.

WOODLAND SUITABILITY GROUP 4

In this group are deep, well-drained, friable soils that have a thick loamy sand surface soil. These soils have moderate to rapid infiltration, moderate to slow permeability, and medium available moisture capacity. Organic matter and natural fertility are medium to low. The soils are--

Caroline loamy sand, thick surface, 2 to 6 percent slopes.
Caroline loamy sand, thick surface, 6 to 10 percent slopes.
Kalmia loamy sand, thick surface.
Killian loamy sand, thick surface, 2 to 6 percent slopes.
Killian loamy sand, thick surface, 6 to 10 percent slopes.
Norfolk loamy sand, thick surface, 0 to 2 percent slopes.
Norfolk loamy sand, thick surface, 2 to 6 percent slopes.
Norfolk loamy sand, thick surface, 6 to 10 percent slopes.
Ruston loamy sand, thick surface, 0 to 2 percent slopes.
Ruston loamy sand, thick surface, 2 to 6 percent slopes.
Ruston loamy sand, thick surface, 6 to 10 percent slopes.
Ruston loamy sand, thick surface, 10 to 15 percent slopes.

On these soils loblolly and slash pines are preferred for sawtimber and pulpwood, but longleaf and shortleaf pines are also suitable for those forest products. All four species of pine can produce poles and piling of medium length. Laurel cherry, redcedar, Arizona cypress, and ligustrum are suited as an understory in windbreaks. Persimmon, mulberry, dogwood, pecan, black cherry, oak, and hickory provide food for wildlife.

For well-stocked, unmanaged stands 50 years old, the approximate average annual growth (Scribner) in board feet per acre is 515 for loblolly pine, 180 for longleaf pine, 170 for shortleaf pine, and 360 for slash pine.

Plant competition is severe on these soils. Competing plants include upland oak, hickory, dogwood, and other vegetation. Frequently it is necessary to prepare sites before planting seedlings, or to eliminate or control competing plants by intensive practices that include land clearing, disking, furrowing, undercutting roots, burning, brush cutting, or applying herbicides.

Seedling mortality is slight or moderate, and generally less than 25 percent of the planted seedlings die. Occasionally mortality ranges from 25 to 50 percent of planted stock and replanting is necessary. Natural reseeding is usually adequate when sites are prepared, competing plants are controlled, and seeds are plentiful.

Equipment can generally be operated without restriction and without damage to tree roots. Erosion is only a slight hazard, but soil blowing occurs in large open areas. To protect seedlings planted for windbreaks against soil blowing, it may be necessary to seed Abruzzi rye or some other plant for cover. Windthrow is a slight hazard.

WOODLAND SUITABILITY GROUP 5

This group consists of deep, nearly level, moderately well drained and well drained soils with a silt loam and loamy sand surface layer and subsoil. These soils are in alluvium along the Congaree River flood plain, in depressions on uplands, and in draws. They are subject to occasional overflow. Generally they have moderate infiltration, moderately rapid permeability, and medium available moisture capacity. The moisture supply is ample for good tree growth. Organic matter and natural fertility are medium to high. The soils are--

Congaree silt loam.
Local alluvial land.

On these soils the preferred trees are sweetgum, yellow-poplar, blackgum, ash, sycamore, cottonwood, black walnut, red maple, cherrybark oak, Shumard oak, white oak, cow oak, loblolly pine, and slash pine. Other suitable trees are hackberry, beech, birch, American elm, winged elm, hickory, magnolia, post oak, water oak, willow oak, persimmon, mulberry, dogwood, redcedar, and honey locust.

These soils can produce sawtimber, pulpwood, high-quality veneer, and long poles and piling. Most of the suitable trees supply food for wildlife. For well-stocked, unmanaged stands 50 years old, the approximate average annual growth (Scribner) in board feet per acre is 685 for loblolly pine, 325 for longleaf pine, 315 for shortleaf pine, and 580 for slash pine.

Plant competition is slight to severe on these soils. Grasses, vines, and reeds compete severely with the weaker kinds of trees. To establish preferred species, it is necessary to prepare sites, or to eliminate or control competing plants by

intensive practices that include land clearing, disking, furrowing, brush cutting, burning, and applying herbicides. Competition is slight in areas where the preference of certain trees is not important, and not much is done to the site or to control vegetation. In these areas the stronger trees tend to survive.

Seedling mortality is slight to severe. If the supply of seed is adequate, or if good techniques are used in planting seeds or seedlings, natural restocking is generally satisfactory where competing vegetation is controlled. Generally, less than 25 percent of the seedlings die. Floods generally last only a short time, but occasionally, prolonged flooding and silting restrict the regeneration of some trees.

When they are wet, these fine-textured soils puddle and pack. To prevent damage to the soil and tree roots, extensive grazing, tillage, and the use of forestry equipment should be avoided during wet periods. Occasionally, floods prevent access to the soils in this group, but generally for less than 3 months during the year.

Erosion and windthrow are only slight hazards on these soils. During prolonged droughts sweetgum and other trees are damaged by dieback.

WOODLAND SUITABILITY GROUP 6

In this group are well-drained soils with a loamy sand surface layer that ranges from 5 to 30 inches in thickness. The subsoil is thin, very firm, and in some places, weakly cemented. These soils have medium infiltration and low available moisture capacity. Permeability is rapid to very rapid in the surface layer but is slow in the subsoil. Organic matter and natural fertility are low. The soils are--

Vaucluse loamy sand, 2 to 6 percent slopes.
Vaucluse loamy sand, 2 to 6 percent slopes, eroded.
Vaucluse loamy sand, 6 to 10 percent slopes.
Vaucluse loamy sand, 6 to 10 percent slopes, eroded.
Vaucluse loamy sand, 10 to 15 percent slopes.
Vaucluse loamy sand, 10 to 15 percent slopes, eroded.
Vaucluse loamy sand, 15 to 20 percent slopes, eroded.
Vaucluse loamy sand, thick surface, 2 to 6 percent slopes.
Vaucluse loamy sand, thick surface, 6 to 10 percent slopes.
Vaucluse loamy sand, thick surface, 10 to 15 percent slopes.

The soils in this group without a thick surface layer or a thick solum have a restricted root zone and may not be suitable for commercial production of sawtimber and pulpwood. Some severely eroded inclusions in the eroded soils have characteristics that vary and differ greatly from those given for the group. There are many galled spots and gullies.

Slash, Virginia, and shortleaf pines are preferred in areas that are prepared for planting trees as a part of the measures taken to control erosion. Trees that produce food for wildlife are not suited to these areas. In other areas not planted for the particular purpose of controlling erosion, slash, loblolly, shortleaf, longleaf, and Virginia pines are preferred.

These soils have a low yield in wood products and are most suitable for stands that produce small sawlogs or pulpwood. They can also produce poles and piling of short length. Sandhill oaks yield food for wildlife, but the quantity of acorns is small on these soils. For well-stocked, unmanaged stands 50 years old, the approximate average annual growth (Scribner) in board feet per acre is 255 for loblolly pine, 75 for longleaf pine, 95 for shortleaf pine, and 195 for slash pine.

Competition from undesired vegetation is slight in severely eroded areas, for those areas are generally too droughty for hardwoods. In other areas turkey, post, and bluejack oaks and wiregrass compete severely with desirable trees. It is necessary to prepare sites before planting seedlings, or to control or eradicate competing plants by intensive practices that include brush cutting, furrowing, land clearing, disking, or applying herbicides.

The mortality of seedlings ranges from slight to severe. Expected mortality is slight on the gentle slopes that are only slightly eroded. Frequently there is enough moisture for trees to regenerate naturally, and seedling stands are severely overstocked. When the trees grow larger, however, the moisture supply becomes a limiting factor because of the low available moisture capacity in this group of soils. The moisture supply is severely limited by the time trees attain pulpwood or small sawlog size.

In severely eroded areas or where root zones are shallow, poor moisture and other unfavorable soil properties cause severe mortality of seedlings. More than 50 percent of the planted seedlings are expected to die. Natural regeneration does not produce an adequate stand in these areas. To secure adequate survival it is necessary to use superior planting techniques that include preparing the site, mulching, and planting high-quality seedlings. Also, erosion should be controlled by vegetation or by erosion control structures.

The use of equipment or tools is severely limited on steep slopes, in severely eroded areas, and in areas that have a shallow root zone because of cementation. The equipment limitation is slight where the surface soil is thick and slopes are gentle.

The soils in this group are likely to be severely eroded because the surface soil is loose and the subsoil is slowly permeable. Saturated soils erode easily, particularly on the steeper slopes. The erosion hazard is severe on slopes of more than 6 percent and in severely eroded areas. It is moderate on slopes of less than 6 percent and in slightly eroded areas. As much as possible, avoid constructing roads, firebreaks, and furrows that disturb the protective cover. Necessary construction and operations should follow the contour.

Windthrow is a moderate or severe hazard (fig. 10). Windthrow is severe in severely eroded areas

Figure 10.--Severe windthrow on Vaucluse loamy sand, 6 to 10 percent slopes, eroded, in woodland suitability group 6.

or in areas that have a shallow root zone because of cementation or concretions. In these areas trees do not develop a stabilizing root system. In other areas the hazard is moderate and windfall may not occur. If, however, winds loosen the roots, a root-rot fungus or insects may damage trees to the extent that they have to be removed. Where the root zone is shallow, fire may severely damage roots.

WOODLAND SUITABILITY GROUP 7

This group consists of nearly level, somewhat poorly drained to poorly drained sandy loams with a sandy loam to sandy clay loam subsoil. These soils have moderate to rapid infiltration and permeability and medium available moisture capacity. The soils are--

Dunbar sandy loam.
Izagora sandy loam, gray variant.
Lynchburg sandy loam.
Rains sandy loam.

On these soils loblolly and slash pines are preferred for sawtimber and pulpwood. Although not so suitable for sawtimber and pulpwood, shortleaf and longleaf pines also grow well. Pond pine is a less desirable tree. It grows in many poorly drained, burned-over areas and is suited to small sawtimber and to pulpwood. All of these pines can produce poles and piling of medium length. Oak, maple, and gum produce abundant food for wildlife, and longleaf pine attracts quail.

For well-stocked, unmanaged stands 50 years old, the approximate average annual growth (Scribner) in board feet per acre is 425 for loblolly pine, 475 for slash pine, 240 for longleaf pine, 360 for shortleaf pine, and 100 for pond pine. Pond pine on these soils has a site index of 66.

Plant competition is severe on these soils. Competing trees and other plants include water oak, willow oak, sweetgum, maple, gallberry, myrtle, saw-palmetto, wiregrass, and briars. It is necessary to eliminate or control competing plants by intensive practices that include land clearing, disking, brush cutting, burning, and applying herbicides.

Mortality of seedlings generally is slight, but in poorly drained areas and in depressions, it is moderate and mortality ranges from 25 to 50 percent of planted seedlings. Replanting is needed to fill in large openings because the preferred trees do not regenerate well enough naturally. Survival can be improved by preparing the site and draining excess water.

The poor drainage moderately restricts grazing and the use of equipment on these soils. To prevent damage to the soils and to tree roots, machines should not be operated or cattle grazed during wet periods. Drainage generally reduces limitations to the use of equipment, especially in large areas. Erosion and windthrow are generally slight hazard.

WOODLAND SUITABILITY GROUP 8

This group consists of nearly level, deep, somewhat poorly drained and moderately well drained silt loams. These soils are on the alluvial flood plains of streams flowing from the Piedmont. They have slow infiltration, generally moderate permeability, and high available moisture capacity. The organic-matter content and natural fertility are medium. The moisture supply is ample for good tree growth. These soils are subject to frequent flooding. In this group are--

Congaree-Chewacla silt loams.
Chewacla silt loam.

The preferred trees on these soils are sweetgum; blackgum; cherrybark, cow, Shumard, and white oaks; ash; yellow-poplar; cottonwood; loblolly pine; cypress; and red maple. Next in preference are willow, water, and post oaks; hackberry; American and winged elms; hickory; American beech; persimmon; and mulberry. Weed trees include boxelder, blue beech, hophornbeam, and hawthorn.

The preferred trees can produce sawtimber and pulpwood, wood for high-quality veneer, and long poles and piling. All the trees provide abundant food for wildlife.

For well-stocked, unmanaged stands 50 years old, the approximate average annual growth (Scribner) in board feet per acre is 715 for loblolly pine, 265 for longleaf pine, and 630 for slash pine. Preliminary field studies indicate the site index of sweetgum is similar to that of loblolly pine (table 3).

The native vegetation, which consists mainly of hardwoods and ground cover, competes severely with pine trees. It also competes severely if a hardwood that cannot withstand competing plants is favored in management. It is necessary to prepare seedbeds before planting, and to control or eliminate competing plants by intensive practices that include burning, applying herbicides, land clearing, and disking. If a specified kind of tree is not selected for management, the hazard of competition is slight

and a well-stocked stand of mixed trees can be expected.

Seedling mortality is slight to severe, depending on the kind of tree. Overflow may prevent seeds from germinating and seedlings from growing. Prolonged flooding and consequent silting severely damage seedlings during their growing season. Mortality can be reduced by removing excess water, but this is not feasible in many areas.

Equipment limitation is moderate because of flooding and poor drainage. Equipment and concentrations of livestock should be kept off these soils when they are wet because they puddle and pack easily and tree roots are damaged. Though floods and debris interfere with drainage and water-control structures, water management can improve access and the ease of operations. Adequate drainage is necessary if good roads are to be maintained.

Erosion and windthrow are only slight hazards on these soils, but hardwoods are attacked by dieback in droughty periods.

Many trees are suited to the soils in this group. These trees have a high production potential, but they require intensive management. To attain this potential, it is necessary to plant a selected tree in an area best suited to it; appropriate management can then be devised. Putnam, Furnival, and McKnight (11) list approximately 70 commercial trees suited to the bottom lands in the Southern States and describe the site requirements of these trees.

WOODLAND SUITABILITY GROUP 9

In this group are nearly level, poorly drained soils with a sandy loam or loam surface soil and a sandy clay to clay subsoil. These soils have slow infiltration and permeability and medium available moisture capacity. In slight depressions water stands on the surface for long periods. The organic-matter content is medium to high, and natural fertility is medium. The soils are--

Coxville sandy loam.
Grady loam.
Grady sandy loam.

Where these soils are adequately drained, loblolly and slash pines are preferred for sawtimber and pulpwood. Less well suited for sawtimber and pulpwood are longleaf, shortleaf, and pond pines. All five of these pines, however, produce poles and piling of medium to long length.

In areas that are too wet for pine, the preferred trees are sweetgum, maple, blackgum, and cypress, but in these areas the timber is not so good as that on the alluvial flood plains.

For well-stocked, unmanaged stands 50 years old, the approximate average annual growth (Scribner) in board feet per acre is 545 for loblolly pine, 485 for slash pine, 215 for longleaf pine, 315 for shortleaf pine, and 115 for pond pine. Pond pine on these soils has a site index of 70. The site index for cypress and hardwoods has not been determined.

Plant competition is moderate or severe on these soils. Competing trees and other plants include sweetgum, maple, holly, ironwood, elm, gallberry, myrtle, briars, and sedges. Before establishing seedlings it is necessary to eliminate or control competing plants by intensive treatments that include water management (fig. 11), burning, land clearing, brush cutting, and applying herbicides. In poorly drained areas where cypress and hardwoods are preferred, plant competition is moderate. Wetness in these areas may delay establishment and growth of seedlings or sprouts, and some areas may require light preparation of sites or management that favors selected trees.

Mortality of seedlings ranges from slight in the high areas to severe or even complete mortality in depressions and in low, very poorly drained areas where water stands on the surface for long periods. Some areas are practically treeless, partly because of seedling mortality, previous cuttings, and severe fires during droughts. Floods during the growing season kill pine seedlings and damage seedlings of water-tolerant trees. Many places require drainage of excess water if seedlings are planted, or if good stands of preferred trees are to seed naturally.

To permit access to forest stands and to maintain roads, excess water should be removed from depressions and from areas that have a fine-textured surface soil. If livestock is concentrated or machinery is operated in these areas, the soil may be compacted and tree roots damaged. In the higher areas limitations to the use of equipment and to grazing are moderate. In wet periods equipment and livestock should be excluded from the higher areas so that the soil and trees are not damaged. Erosion and windthrow are slight hazards.

WOODLAND SUITABILITY GROUP 10

Wehadkee and Chewacla silt loams are the only soils in this group. These are poorly drained soils

Figure 11.--Drainage ditch on soil in woodland suitability group 9.

with a silt loam surface layer and a silt loam to silty clay loam subsoil. They have slow infiltration and permeability and high available moisture capacity. The organic-matter content and natural fertility are medium. These soils are flooded frequently. Their water table is normally within 1 foot of the surface.

On these soils loblolly pine is the preferred tree for sawtimber and pulpwood, for long poles and piling, and for veneer of high quality. The hardwoods preferred are sweetgum, ash, blackgum, tupelo, cypress, and red maple. Next in preference are persimmon, hickory, willow oak, water oak, elm, and beech. Many of these hardwoods supply food for wildlife. Well-stocked, unmanaged stands of loblolly pine 50 years old have an approximate average annual growth (Scribner) of about 710 board feet per acre.

The native vegetation, which consists of hardwoods and ground cover, competes severely with pines. It also competes severely with a hardwood favored in management, if that hardwood is intolerant of other hardwoods. Where competition is severe, it is necessary to prepare seedbeds and to control or eradicate competing plants by intensive practices that include burning, applying herbicides, land clearing, and disking. In stands where no specified trees are preferred or favored in management, competition is slight and a well-stocked stand of mixed trees can be expected.

Seedling mortality varies with the different kinds of trees. Because of poor drainage and flooding, many seeds of conifers and hardwoods do not germinate and many planted seedlings do not grow. Recently germinated seedlings are subject to severe mortality caused by prolonged flooding and silting. Although managing water improves these soils and reduces mortality, this management is not feasible in all areas.

The equipment limitation is severe because of poor drainage, a high water table, and flooding. The fine-textured surface soil is boggy and slippery when wet, and tree roots can be severely damaged. The soils puddle and compact easily. Intensive grazing and the use of equipment should be avoided when these soils are wet. In maintaining roads, the soils should be drained where possible. Erosion and windthrow are slight hazards.

Many kinds of trees are suited to these soils. Their production potential is excellent and justifies intensive management that includes the selection of trees and the improvement of sites. To attain highest yields the forester must know the requirements of the site and the treatment needed for each kind of tree. Putnam, Furnival, and McKnight (11) list approximately 70 important trees that are suited to the bottom lands in the Southern States. They also describe the important characteristics of these trees and give their site requirements.

WOODLAND SUITABILITY GROUP 11

This group consists of nearly level to depressional, very poorly drained soils with a black, organic surface soil and a gray sandy loam to clay loam subsoil. These soils have moderate infiltration and permeability and a medium to high available moisture capacity. The organic-matter content is high, and natural fertility is medium. The soils are--

Okenee loam.
Portsmouth loam.

Where drainage is adequate on these soils, loblolly and slash pines are preferred for sawtimber or pulpwood. The sawtimber is of high quality, and long poles and piling are also produced. Pond and longleaf pines are somewhat less suitable than loblolly and slash pines. Where drainage is not adequate for the preferred pines, suitable trees are sweetgum, blackgum, tupelo, maple, and cypress. For well-stocked, unmanaged stands 50 years old, the average annual growth (Scribner) in board feet per acre is 670 for loblolly pine, 215 for longleaf pine, 600 for slash pine, and 120 for pond pine. Pond pine on these soils has a site index of 41 ± 8.

Plant competition is slight to severe on these soils. Competing trees and other plants include water oak, willow oak, maple, sweetgum, blackgum, gallberry, myrtle, bay, and briars. It is necessary to prepare sites before planting seedlings of preferred species, and to control or eliminate competing plants by intensive treatments that include water management, burning, land clearing, disking, brush cutting, or applying herbicides. If no specified tree is preferred, plant competition is slight.

Seedling mortality is severe in ponded areas. Excess water should be disposed of if desired trees are to regenerate naturally or artificially. In areas that are not ponded, seedling mortality is moderate and from 25 to 50 percent of planted stock is expected to die. Replanting may be necessary to fill in large openings. Unless sites are well prepared, desired trees probably will not regenerate naturally.

Equipment limitations are severe because the surface soil is fine textured and drainage is poor. Drainage is needed so that roads can be maintained and the stands can be reached and managed. Intensive grazing and the use of equipment during wet periods should be avoided to prevent puddling, compaction, and damage to soil and tree roots. Erosion and windthrow are slight hazards on these soils.

WOODLAND SUITABILITY GROUP 12

In this group are poorly drained soils with a dark-gray loamy sand or loamy fine sand surface layer and, in most places, a loamy sand or sand subsoil. These soils generally have rapid infiltration and permeability, low to medium available moisture capacity, and a high water table. The organic-matter content is high, and natural fertility is low. The soils are--

Myatt loamy sand.
Plummer-Rutlege loamy fine sands.

Water is sometimes excessive on these soils and may stand for long periods. The Myatt soil has a sandy loam subsoil and moderately slow infiltration and permeability.

On this group of soils loblolly and slash pines are preferred for producing sawtimber and pulpwood. Longleaf pine is also suited but is not so well suited as loblolly and slash pines. All these pines can produce poles and piling of medium length. Areas that receive seepage from high areas are suitable for pond pine, blackgum, sweetgum, juniper, ash, and red maple. Cypress and tupelo are preferred where water stands on the surface for long periods. The hardwoods and conifers on these soils are of poorer quality than those on the flood plains in the Piedmont. Most of the hardwoods produce food for wildlife.

For well-stocked, unmanaged stands 50 years old, the approximate average annual growth (Scribner) in board feet per acre is 490 for loblolly pine, 250 for longleaf pine, 465 for slash pine, and 145 for pond pine. Pond pine on these soils has a site index of 76.

Plant competition is slight to severe on these soils. Competing trees and other plants include hardwoods, switchcane, briers, vines, gallberry, and bay. If pines or intolerant hardwoods are selected for management, it is necessary to control or eradicate competing plants by intensive practices that include water management, burning, land clearing, disking, brush cutting, and applying herbicides. If there is no preference of trees, competition is slight.

Because these soils are wet much of the time, seedling mortality is severe and more than 50 percent of planted seedlings are expected to die. Natural regeneration of preferred trees cannot be relied on to produce adequate stands. To insure well-stocked stands, therefore, it is necessary to provide drainage, intensive site preparation, good planting stock, and special techniques.

The poor drainage and seepage severely restrict grazing and the use of equipment. Drainage is needed so that roads can be maintained and stands can be reached and managed. Some areas may be difficult to drain, and ditches may be hard to maintain because the coarse-textured subsoil is likely to cave in. Erosion and windthrow are only slight hazards.

WOODLAND SUITABILITY GROUP 13

In this group are severely eroded, deep, well-drained soils with a sandy clay loam surface layer and a sandy clay subsoil. These soils have rapid surface runoff, slow infiltration, moderate permeability, and medium available moisture capacity. The organic-matter content is low. Slopes range from 2 to 15 percent. The soils are--

Caroline sandy clay loam, 6 to 10 percent slopes, severely eroded.
Magnolia sandy clay loam, 2 to 6 percent slopes, severely eroded.
Magnolia sandy clay loam, 6 to 10 percent slopes, severely eroded.
Magnolia sandy clay loam, 10 to 15 percent slopes, severely eroded.

On these soils loblolly and slash pines are preferred for producing sawtimber and pulpwood, but longleaf and shortleaf pines are also suited. All these pines can produce poles and piling of medium or short length. Oak and hickory supply food for wildlife. The site index of these soils is lower than that of the uneroded Caroline and Magnolia soils in woodland suitability group 3 because of faster surface runoff, slower infiltration, and lower available moisture. For well-stocked, unmanaged stands 50 years old, the approximate average annual growth (Scribner) in board feet per acre is 355 for loblolly pine, 170 for longleaf pine, 285 for shortleaf pine, and 345 for slash pine.

Upland oak, hickory, and other plants compete severely with the preferred pines. Intensive practices needed to control or to eradicate competing plants include land clearing, disking, furrowing, brush cutting, burning, and applying herbicides.

The expected mortality of seedlings is slight to moderate, and adequate stands are established naturally and by planting. In some places, however, it may be necessary to prepare sites specially and to replant large openings.

Severe erosion and the steep slopes of some of the soils in this group moderately restrict the use of equipment. Intensive grazing and the use of machines should be avoided to prevent damage to soil and tree roots. To lessen damage from additional erosion on these severely eroded soils, prepare sites, control competing plants, and use other practices of good management, but do not disturb the protective cover any more than necessary. Roads, furrows, firebreaks, and other structures used in forestry operations should follow the contour. Windthrow is a slight hazard.

WOODLAND SUITABILITY GROUP 14

In this group are soils that vary in most of their characteristics and qualities. The soils are--

Mixed alluvial land.
Sandy and clayey land, sloping.
Sandy and clayey land, moderately steep.
Swamp.

Mixed alluvial land consists of sand to silty clay that formed in alluvial and colluvial sediments along the creeks, rivers, and smaller streams. The texture of the soils in this group varies. It is loamy sand in most places but is silty clay in areas of Swamp along the Congaree River. The surface layer is generally dark gray or black and contains a large amount of organic matter. Mixed alluvial land is somewhat poorly drained and poorly drained; Swamp is generally very poorly drained. Excess water comes from overflowing streams, a high water table, and water than runs in from the nearby uplands.

The Sandy and clayey lands in this group have a weakly developed profile and soil materials that resemble those of the Eustis, Lakeland, Orangeburg, Ruston, Magnolia, Vaucluse, and Caroline soils. Slopes range from 10 to 25 percent. The surface layer of sand to loamy sand is underlain by a subsoil that is generally sand to sandy clay. Infiltration and permeability are rapid to slow, and the available moisture capacity is low to high. The

available moisture is greater in low areas than in high ones because the ground water is nearer the surface. Although the root zone is generally thick, it is thin in some places on the steeper slopes. The site index and hazards of these soils are not listed in table 3. Investigations should be made on sites to determine suitability for specific wood crops.

Growth and yield of trees

Data on growth and yields of unmanaged, well-stocked stands are not a true measure of productivity, but these data permit a comparison of productivity between two or more sites or between two or more species on the same site. If a planner compares the potential yields of wood crops with potential yields of other crops, he can choose the best land use. If growing trees is the best land use, he can determine the kinds of trees to favor and he can select appropriate practices of woodland management.

From figure 12, the average site index for 50-year-old, well-stocked, unmanaged stands of southern pine can be converted into board feet of average annual growth per acre.

Woodland protection

If high yields are to be obtained from woodland, trees should be protected from fire and overgrazing and insects and diseases should be controlled. Damage by overgrazing is slight in Calhoun County because little of the woodland is used for grazing.

The South Carolina State Commission of Forestry maintains a staff and equipment that are adequate to control forest fires. Lotti (7) and Metz (9) reported that annual and periodic fires in a 10-year period had no significant effect on the physical properties of the soil in the lower Coastal Plain. They suggest that burning trees may be useful in silviculture.

No severe attacks by insects or disease have occurred in Calhoun County. A root-rot fungus has been observed by the author in this county on naturally occurring loblolly pine and on planted slash pine. Brown spot needle blight, a serious disease of longleaf pine, causes repeated defoliation and sometimes death of seedlings. Infection appears to be more severe on soils prepared for planting if protective ground cover has been distubed and rain splash thus increased. Nematodes severely attack seedling roots in light sandy soils, particularly in fields abandoned after cultivation. The attacks of the Nantucket pine tip moth on loblolly pine are severe on dry sandy soils.

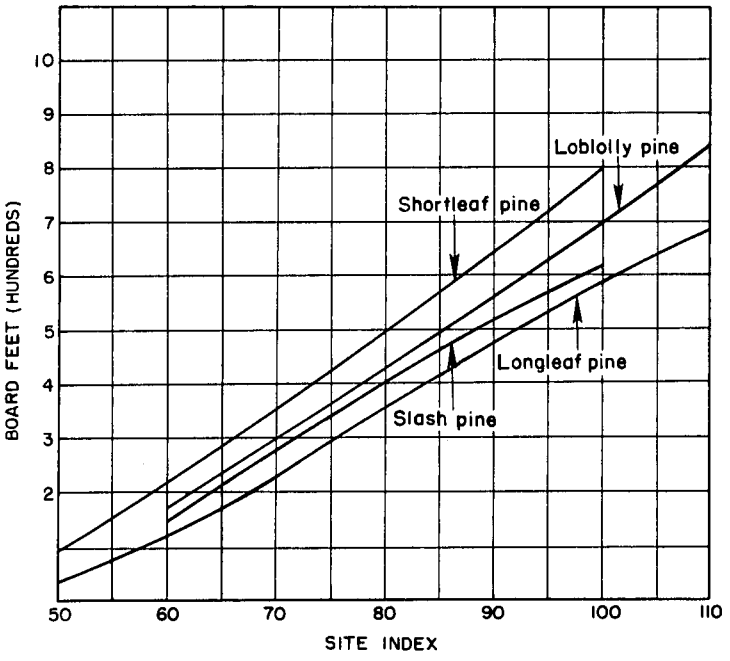

Figure 12.--Average annual growth per acre (Scribner, all stems 8 inches in diameter or more) for 50-year-old, well-stocked, unmanaged stands of shortleaf, loblolly, slash, and longleaf pines at site indexes 50 to 110. Adapted from U.S. Dept. Agri. Misc. Pub. No. 50 (14).

Engineering Applications [5]

Soil engineering is well established today. In a broad sense it is a subdivision of structural engineering, for it deals with soils used as the foundation material upon which structures rest or with the soils used as a structural material. To the engineer, soils are natural materials that occur in great variety on the earth's surface. Properties of soils that affect engineering may vary widely from place to place and within the areas of a single project. Generally, soils are used in the same locality and in the condition that they are found. A large part of soil engineering consists of locating the various soils, of determining their engineering properties, of correlating those properties with the requirements of the job, and of selecting the best possible material for each job.

This soil survey report contains information about the soils in Calhoun County that will help engineers. This subsection emphasizes properties of soils related to agricultural engineering, especially properties affecting irrigation, farm ponds, and structures that control and conserve soil and water. Information in this report is general and is not intended to eliminate the need for sampling and testing for design and construction of specific engineering works. The information in this report can be used to--

1. Make soil and land-use studies that will aid in selecting and developing industrial, business, residential, and recreational sites.
2. Make estimates of the engineering properties of the soils to aid in planning agricultural drainage systems, farm ponds, irrigation systems, and diversion terraces.
3. Make preliminary evaluations of soils and ground conditions that will aid in selecting sites for highways, airports, and pipelines, and in planning detailed investigations of the selected sites.
4. Locate probable sources of sand and gravel for use in construction.

[5] By HOWARD E. MORRISON, conservation engineer, and CARL B. LAWRENCE, soil scientist, Soil Conservation Service.

5. Determine the suitability of the soils for cross-country movement of vehicles and construction equipment.
6. Correlate performance of engineering structures with the soils and thus develop information that will be useful in designing and maintaining the structures.
7. Supplement information obtained from other published maps and reports and from aerial photographs for the purpose of making soil maps and reports that can be used readily by engineers.
8. Develop other preliminary estimates pertinent to structures in a particular area.

This subsection gives soil data useful in engineering, correlates these data with soil mapping units, and interprets the data to aid the engineer in his search for soil information. Most of the information is in tables 4, 5, and 6. Also described in this subsection are some practices of conservation engineering that apply in Calhoun County. Additional information that is helpful to engineers can be found in the sections "Descriptions of Soils" and "Formation and Classification of Soils." Some terms used by soil scientists may be unfamiliar to engineers, and other terms may have a special meaning in soil science. These terms are defined in the Glossary at the end of the report.

Engineering classification of soils

Most highway engineers classify soil materials according to the system approved by the American Association of State Highway Officials (1, 10). In this system soil materials are classified in seven principal groups. The groups range from A-1, consisting of gravelly soils of high bearing capacity, to A-7, consisting of clay soils having low strength when wet. To further classify the soil material within each group, the relative engineering value of the soil material is indicated by a group index number. These numbers range from 0 for the best materials to 20 for the poorest. The group index number is shown in parentheses following the soil group symbol in table 4.

Some engineers prefer to use the Unified soil classification system (10, 18). In this system soil material is identified as coarse grained (eight classes), fine grained (six classes), or highly organic. The classification of the soils tested in the laboratory according to the Unified system is given in tables 4 and 5.

Soil test data

To help evaluate the soils for engineering purposes, soil samples of major horizons of five extensive soil series were tested according to standard procedures. The laboratory test data are given in table 4. (See page 50)

Each soil listed in table 4 was sampled in only one location. The test data, therefore, indicate the characteristics for these soils at the specified locations where they were tested. The physical characteristics of each soil at other locations may vary from those of the soil sampled in the surface layer and in the B and C horizons. All samples were obtained at a depth of less than 6 feet. The data, therefore, probably are not adequate for estimating the characteristics of soil materials in strongly sloping or steep areas where deep cuts are required.

The engineering soil classifications in table 4 are based on data obtained by mechanical analyses and by tests made to determine liquid limits and plastic limits. Mechanical analyses were made by combined sieve and hydrometer methods.

The test to determine plastic limit and liquid limit measures the effect of water on the consistence of the soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a solid to a semisolid or plastic state. As the moisture content is further increased, the material changes from the plastic state to a liquid. The plastic limit is the moisture content at which the soil material passes from a solid to a plastic state. The liquid limit is the moisture content at which the material passes from a plastic to a liquid state. The plasticity index is the numerical difference between the plastic limit and the liquid limit. It indicates the range of moisture content within which a soil material is in a plastic condition.

Estimated engineering properties

In table 5 (see page 52) the profile of the soils in the county is briefly described and the horizons are classified according to the U.S. Department of Agriculture, the Unified, and the AASHO systems of classification. Generally, the profile described does not extend to a depth of more than 6 feet. Also shown in table 5 are data on physical and chemical properties important to engineering. These properties are estimates based on field observations, past experience, and laboratory test data. The following soils and land types are not listed in table 5:

Borrow pits.
Caroline sandy clay loam, 6 to 10 percent slopes, severely eroded.
Local alluvial land.
Magnolia sandy clay loam, 2 to 6 percent slopes, severely eroded.
Magnolia sandy clay loam, 6 to 10 percent slopes, severely eroded.
Magnolia sandy clay loam, 10 to 15 percent slopes, severely eroded.
Sandy and clayey land, sloping.
Sandy and clayey land, moderately steep.
Swamp.

An explanation of some of the headings in table 5 may be helpful. The depth to the seasonally high water table is the highest level that the water generally rises during the year. The depth from the surface is generally that of the boundaries of the A and B horizons of the profile described as representative in the section "Formation and Classification of Soils."

The soil material in the main horizons is classified according to textural terms used by the U.S.

TABLE 4.--Engineering test data[1] for soil

Soil name and location	Parent material	Bureau of Public Roads report No.	Depth	Horizon	Percentage passing	
					No. 10 (2.0 mm.)	No. 40 (0.42 mm.)
			Inches			
Caroline loamy sand:						
½ mile northwest of U.S. Highway No. 601 and east of U.S. Highway No. 176. (Modal)	Atlantic Coastal Plain--	S38836	0-6	Ap	100	54
		S38837	17-28	B22	100	78
		S38838	38-48+	C1	100	80
Killian loamy sand:						
¼ mile west of U.S. Highway No. 176 and north of county road No. 83. (Modal)	Unconsolidated marine clays and sand.	S38839	0-6	Ap	98 [6]	70
		S38840	16-27	B22	100	62
		S38841	27-40+	C1	100	71
Magnolia sandy loam:						
2 miles east of St. Matthews on north side of U.S. Highway No. 601. (Modal)	Unconsolidated sandy clays and clays.	S38842	0-9	Ap	100	82
		S38843	11-15	B21	100	86
		S38844	15-66+	B22	100	89
Orangeburg loamy sand:						
3½ miles southeast of U.S. Highway No. 601 along State Route 11. (Modal)	Atlantic Coastal Plain--	S38845	0-9	Ap	100	82
		S38846	17-24	B21	100	88
		S38847	24-48	B22	100	89
Rains sandy loam:						
1 mile east of U.S. Highway No. 176 along State Route 91. (Modal)	Atlantic Coastal Plain--	S38848	0-6	A1	100	92
		S38849	13-26	B2g	100	91
		S38850	26-42+	Cg	100	92

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

[2] Mechanical analyses according to the AASHO Designation T 88. Results by this procedure frequently may differ somewhat from results that would have been obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes for soils.

samples taken from five soil profiles

Mechanical analyses 2/					Liquid limit	Plasticity index	Classification	
sieve--	Percentage smaller than--							
No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.			AASHO 3/	Unified 4/
20	14	8	5	3	(5/)	(5/)	A-2-4(0)----	SM.
63	60	59	56	54	83	46	A-7-5(16)---	MH-CH.
53	49	45	41	37	66	34	A-7-5(13)---	MH-CH.
19	15	11	6	5	(5/)	(5/)	A-2-4(0)----	SM.
29	28	26	23	21	35	18	A-2-6(1)----	SC.
30	27	24	19	16	26	10	A-2-4(0)----	SC.
37	26	15	9	7	(5/)	(5/)	A-4(0)------	SM.
51	41	33	29	27	21	9	A-4(3)------	CL.
60	53	47	44	43	36	20	A-6(9)------	CL.
23	14	9	6	5	(5/)	(5/)	A-2-4(0)----	SM.
54	49	44	41	38	39	21	A-6(8)------	CL.
57	53	50	46	44	49	27	A-7-6(12)---	CL.
36	32	26	16	11	21	3	A-4(0)------	SM.
43	40	34	23	16	19	7	A-4(2)------	SM-SC.
47	44	40	33	26	29	14	A-6(4)------	SC.

3/ Based on Standard Specifications for Highway Materials and Methods of Sampling and Testing (Pt. 1, ed. 8). The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes, AASHO Designation: M 145-49.

4/ Based on the Unified Soil Classification System. Tech. Memo. No. 3-357, v. 1, Waterways Experiment Station, Corps of Engineers, March 1953.

5/ Nonplastic.

6/ 100 percent passes a No. 4 sieve (4.7 millimeters).

TABLE 5.--Brief description of soils and their

Map symbol	Soil name	Depth to seasonally high water table	Description of soil and site	Depth from surface
		Feet		Inches
CaB	Caroline loamy sand, 2 to 6 percent slopes.	5+	10 to 30 inches of well-drained loamy sand over 12 to 30 inches of firm clay derived from unconsolidated beds of sandy clays.	0-13 13-37
CaB2	Caroline loamy sand, 2 to 6 percent slopes, eroded.			
CaC	Caroline loamy sand, 6 to 10 percent slopes.			
CaC2	Caroline loamy sand, 6 to 10 percent slopes, eroded.			
CaD	Caroline loamy sand, 10 to 15 percent slopes.			
CaD2	Caroline loamy sand, 10 to 15 percent slopes, eroded.			
CaE2	Caroline loamy sand, 15 to 25 percent slopes, eroded.			
CbB	Caroline loamy sand, thick surface, 2 to 6 percent slopes.			
CbC	Caroline loamy sand, thick surface, 6 to 10 percent slopes.			
Ch	Chewacla silt loam.	0	0 to 30 inches of silty clay loam over 30 inches of silty clay derived from alluvial material washed from soils of the Piedmont Plateau and mountains.	0-7 7-19
Cn	Congaree silt loam.	3+	12 inches of silt loam over 18 to 24 inches of silt loam or fine sandy loam derived from alluvial materials washed from soils of the Piedmont Plateau and mountains.	0-11 11-45
Co	Congaree-Chewacla silt loams.			
Cx	Coxville sandy loam.	0	8 to 10 inches of poorly drained sandy loam over 24 to 30 inches of sandy clay loam derived from beds of unconsolidated sandy clays.	0-10 10-37
Du	Dunbar sandy loam.	1½	7 to 12 inches of somewhat poorly drained sandy loam over 18 to 24 inches of fine sandy clay derived from beds of unconsolidated sandy clays and clays.	0-7 7-30
EmB	Eustis loamy sand, 0 to 6 percent slopes.	5+	30 to 84 inches of loose, excessively drained sand or loamy sand derived from beds of unconsolidated sands.	0-7 7-40 0-50
EmC	Eustis loamy sand, 6 to 10 percent slopes.			
EmD	Eustis loamy sand, 10 to 15 percent slopes.			
EsB	Eustis sand, 0 to 6 percent slopes.			
EsC	Eustis sand, 6 to 10 percent slopes.			
EsD	Eustis sand, 10 to 15 percent slopes.			

estimated physical and chemical properties

Classification			Percentage passing sieve No. 200	Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
USDA texture	Unified	AASHO						
				Inches per hour	Inches per inch of soil	pH		
Loamy sand	SM	A-2-4	15-25	5.00-10.00	0.09	5.8-6.2	High	Low.
Clay	MH-CH	A-7-5	53-63	0.05-0.20	.11	5.0-5.2	Low to moderate.	High.
Silt loam	ML	A-4	90-100	0.80-2.50	.12	5.7	Moderate	Moderate.
Silty clay loam.	CL	A-6 or A-7-6.	95-100	0.05-0.20	.13	5.9	Low	High.
Silt loam	ML	A-4	80-90	0.80-2.50	.13	5.5-6.0	Moderate	Moderate to low.
Very fine sandy loam and silt loam.	ML or CL.	A-4 or A-6.	85-95	0.80-2.50	.13	5.8-6.0	Moderate to low.	Moderate.
Sandy loam	SM	A-4	35-45	0.80-2.50	.13	4.6-5.0	Moderate	Low.
Sandy clay loam.	CL	A-6	55-65	0.05-0.20	.12	4.5-5.0	Moderate to low.	Moderate to high.
Sandy loam	SM	A-4	35-45	0.20-0.80	.10	5.0-5.5	High to moderate.	Low.
Fine sandy clay loam to sandy clay loam.	CL	A-6	55-65	0.05-0.20	.10	5.5	Moderate to low.	Moderate.
Loamy sand	SP or SM.	A-3 or A-2.	5-10	10+	.06	5.1-5.5	High	Low.
Loamy sand	SP or SM.	A-3 or A-2.	5-10	10+	.06	4.7-5.2	High	Low.
Sand	SP or SM.	A-3 or A-2.	5-10	10+	.06	4.8-5.2	High	Low.

TABLE 5.--Brief description of soils and their

Map symbol	Soil name	Depth to seasonally high water table	Description of soil and site	Depth from surface
		Feet		Inches
FaA	Faceville loamy fine sand, 0 to 2 percent slopes.	4+	3 to 13 inches of well-drained loamy fine sand over 13 to 50 inches of sandy clay derived from beds of unconsolidated sandy clays.	0-13 13-38
FaB	Faceville loamy fine sand, 2 to 6 percent slopes.			
FaB2	Faceville loamy fine sand, 2 to 6 percent slopes, eroded.			
FaC2	Faceville loamy fine sand, 6 to 10 percent slopes, eroded.			
FrA	Faceville and Ruston soils, 0 to 2 percent slopes.			
FrB	Faceville and Ruston soils, 2 to 6 percent slopes.			
FrB2	Faceville and Ruston soils, 2 to 6 percent slopes, eroded.			
FrC	Faceville and Ruston soils, 6 to 10 percent slopes.			
FrC2	Faceville and Ruston soils, 6 to 10 percent slopes, eroded.			
FrD2	Faceville and Ruston soils, 10 to 15 percent slopes, eroded.			
Gb	Goldsboro loamy sand.	2½	10 to 14 inches of moderately well drained loamy sand over 18 to 22 inches of sandy clay loam derived from beds of unconsolidated sandy loams and sandy clay loams.	0-14 14-32
Gm	Grady loam.	0	8 to 10 inches of poorly drained sandy loam over 20 to 30 inches of clay or sandy clay derived from beds of unconsolidated sandy clays and clays.	0-9 9-32
Gr	Grady sandy loam.			
GsA	Greenville sandy loam, 0 to 2 percent slopes.	5+	2 to 6 inches of sandy loam over 12 to 15 inches of sandy clay loam over 15 to 70 inches or more of sandy clay derived from beds of unconsolidated sandy clays.	0-5 5-15 15-72
GsB	Greenville sandy loam, 2 to 6 percent slopes.			
GsB2	Greenville sandy loam, 2 to 6 percent slopes, eroded.			
GsC2	Greenville sandy loam, 6 to 10 percent slopes, eroded.			
Iz	Izagora sandy loam, gray variant.	1½	12 to 18 inches of moderately well drained sandy loam over 18 to 24 inches of sandy clay derived from beds of sandy loam and sandy clay deposited as stream terraces.	0-15 15-38

estimated physical and chemical properties--Continued

Classification			Percentage passing sieve No. 200	Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
USDA texture	Unified	AASHO						
				Inches per hour	Inches per inch of soil	pH		
Loamy sand------	SM--------	A-2-----	15-30	5.00-10.00	0.07	5.5-6.0	High--------	Low.
Sandy clay------	CL--------	A-6-----	55-65	0.20-0.80	.10	5.5	Low---------	Moderate.
Loamy sand------	SP or SM.	A-2-----	10-30	10+	.07	5.6-6.0	High--------	Low.
Sandy clay loam.	CL--------	A-4 or A-6.	55-65	0.20-0.80	.10	5.1-5.5	Moderate to low.	Moderate to high.
Loam to sandy loam.	SM--------	A-4-----	35-45	0.80-2.50	.10	5.1-5.5	High--------	Low to moderate.
Sandy clay to clay.	CL--------	A-6-----	55-65	0.05-0.20	.14	5.0	Low---------	High.
Sandy loam------	SM--------	A-2 or A-4.	25-35	2.50-5.00	.05	5.8-6.3	High--------	Low.
Sandy clay loam.	SC or CL.	A-4 or A-6.	35-55	0.80-2.50	.10	5.7	Low---------	Moderate to high.
Sandy clay------	SC--------	A-6-----	35-45	0.80-2.50	.11	5.7	Moderate to low.	Moderate.
Sandy loam------	SM--------	A-4-----	35-45	0.20-0.80	.08	5.2-5.8	High--------	Low.
Sandy clay------	SC or CL.	A-4 or A-6.	45-65	0.20-0.80	.12	4.5-5.0	Moderate to low.	Moderate to high.

TABLE 5.--Brief description of soils and their

Map symbol	Soil name	Depth to seasonally high water table	Description of soil and site	Depth from surface
		Feet		Inches
Ka	Kalmia loamy sand, thick surface.	3	10 to 18 inches of well-drained loamy sand over 12 to 24 inches of sandy loam derived from beds of sands and sandy loams of stream terraces.	0-14 14-26
KbB	Killian loamy sand, 2 to 6 percent slopes.	3	8 to 12 inches of well-drained loamy sand over 12 to 20 inches of firm clay derived from beds of unconsolidated sandy clays and clays.	0-9 9-30
KbC	Killian loamy sand, 6 to 10 percent slopes.			
KbC2	Killian loamy sand, 6 to 10 percent slopes, eroded.			
KbD	Killian loamy sand, 10 to 15 percent slopes.			
KtB	Killian loamy sand, thick surface, 2 to 6 percent slopes.	3	18 to 30 inches of well-drained loamy sand over 12 to 20 inches of firm clay derived from beds of unconsolidated sandy clays and clays.	0-20 20-40
KtC	Killian loamy sand, thick surface, 6 to 10 percent slopes.			
La	Lakeland loamy sand.	5+	3 to 10 feet or more of excessively drained sand or loamy sand derived from beds of unconsolidated sands.	0-6 6-48
LkB	Lakeland sand, 0 to 6 percent slopes.			
LkC	Lakeland sand, 6 to 10 percent slopes.			
LkD	Lakeland sand, 10 to 15 percent slopes.			
LsA	Lakeland sand, shallow, 0 to 2 percent slopes.	5	2½ to 4 feet of sand over 1 foot or more of sandy loam or sandy clay derived from beds of unconsolidated sands.	0-36 36-40+
LsB	Lakeland sand, shallow, 2 to 6 percent slopes.			
LsC	Lakeland sand, shallow, 6 to 10 percent slopes.			
LsD	Lakeland sand, shallow, 10 to 15 percent slopes.			
Ly	Lynchburg sandy loam.	1	10 to 14 inches of sandy loam to loamy sand over 18 to 29 inches of sandy clay loam or sandy loam derived from beds of unconsolidated sandy loams and sandy clays.	0-13 13-35

estimated physical and chemical properties--Continued

Classification			Percentage passing sieve No. 200	Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
USDA texture	Unified	AASHO						
				Inches per hour	Inches per inch of soil	pH		
Loamy sand	SM	A-2	10-30	5.00-10.00	0.06	5.5-6.0	High	Low.
Sandy loam	ML or CL.	A-4	55-65	0.80-2.50	.10	5.5	Moderate	Moderate.
Loamy sand	SM	A-2-4	15-25	5.00-10.00	.09	5.2-5.5	High	Low.
Clay	SC	A-2-6	25-35	0.05-0.20	.11	5.0	Moderate	Moderate.
Loamy sand	SM	A-2	15-25	5.00-10.00	.09	5.2-5.5	High	Low.
Clay	SC	A-6	25-35	0.05-0.20	.11	5.0	Moderate	Moderate.
Sand	SP or SM.	A-3 or A-2.	5-10	10+	.06	5.3-5.6	High	Low.
Sand or loamy sand.	SP or SM.	A-3 or A-2.	5-30	10+	.06	5.0-5.4	High	Low.
Sand	SP or SM.	A-3 or A-2.	5-10	10+	.06	5.5-5.9	High	Low.
Sandy loam	SP or SM.	A-3 or A-2.	5-12	10+	.06	5.0-5.3	High	Low.
Sandy loam	SM	A-4	20-40	0.80-2.50	.10	5.0-5.5	High	Low.
Sandy loam or sandy clay loam.	SM or SC.	A-4 or A-6.	30-45	0.20-0.80	.10	4.8-5.3	Moderate	Low to moderate.

TABLE 5.--Brief description of soils and their

Map symbol	Soil name	Depth to seasonally high water table	Description of soil and site	Depth from surface
		Feet		Inches
MgA	Magnolia sandy loam, 0 to 2 percent slopes.	5+	8 to 12 inches of sandy clay loam over 30 to 72 inches of sandy clay derived from beds of unconsolidated sandy clays.	0-11
MgB	Magnolia sandy loam, 2 to 6 percent slopes.			11-66
MgB2	Magnolia sandy loam, 2 to 6 percent slopes, eroded.			
MgC	Magnolia sandy loam, 6 to 10 percent slopes.			
MgC2	Magnolia sandy loam, 6 to 10 percent slopes, eroded.			
MgD2	Magnolia sandy loam, 10 to 15 percent slopes, eroded.			
MrA	Marlboro fine sandy loam, 0 to 2 percent slopes.	5+	8 to 12 inches of fine sandy loam over 36 to 42 inches of clay loam derived from beds of unconsolidated fine sandy clays and clays.	0-11
MrB	Marlboro fine sandy loam, 2 to 6 percent slopes.			11-40
My	Myatt loamy sand.	1	0 to 13 inches of poorly drained loamy sand over 18 to 24 inches of sandy loam or sandy clay loam derived from beds of sandy loams or sandy clays on stream terraces.	0-13
				13-35
NfA	Norfolk loamy sand, 0 to 2 percent slopes.	3+	10 to 16 inches of well-drained loamy sand over 24 to 30 inches of sandy loam derived from beds of unconsolidated sandy loams and sandy clays.	0-13
NfB	Norfolk loamy sand, 2 to 6 percent slopes.			13-42
NfB2	Norfolk loamy sand, 2 to 6 percent slopes, eroded.			
NfC	Norfolk loamy sand, 6 to 10 percent slopes.			
NoA	Norfolk loamy sand, thick surface, 0 to 2 percent slopes.	3+	18 to 30 inches of well-drained loamy sand over 12 to 24 inches of sandy loam derived from beds of unconsolidated sandy loams and sandy clays.	0-30
NoB	Norfolk loamy sand, thick surface, 2 to 6 percent slopes.			30-44
NoC	Norfolk loamy sand, thick surface, 6 to 10 percent slopes.			
NtB	Norfolk loamy sand, thin solum, 2 to 6 percent slopes.	3+	10 to 16 inches of well-drained loamy sand over 24 to 30 inches of sandy loam derived from beds of unconsolidated sandy loams and sandy clays.	0-13
NtB2	Norfolk loamy sand, thin solum, 2 to 6 percent slopes, eroded.			13-42
NtC	Norfolk loamy sand, thin solum, 6 to 10 percent slopes.			

estimated physical and chemical properties--Continued

Classification			Percentage passing sieve No. 200	Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
USDA texture	Unified	AASHO						
				Inches per hour	Inches per inch of soil	pH		
Sandy loam------	SM--------	A-4-----	30-50	2.50-5.00	0.06	5.9-6.1	High to moderate.	Low.
Sandy clay------	CL--------	A-4 or A-6.	50-60	0.80-2.50	.12	5.8-6.1	Low---------	Moderate.
Fine sandy loam.	SM--------	A-4-----	40-50	2.50-5.00	.06	5.6-6.0	High to moderate.	Low to moderate.
Clay loam-------	CL--------	A-6-----	65-75	0.20-0.80	.12	5.5-5.8	Low---------	Moderate to high.
Loamy sand------	SP or SM.	A-2-----	10-30	5.00-10.00	.08	4.5-5.0	High--------	Low.
Sandy loam to sandy clay loam.	SM or CL.	A-4 or A-6.	50-60	0.20-2.50	.10	5.0-5.3	Moderate to low.	Moderate.
Loamy sand------	SP or SM.	A-2-----	10-30	10+	.07	5.6-6.0	High--------	Low.
Sandy loam------	CL--------	A-4-----	55-65	0.80-2.50	.11	5.6-5.8	Moderate to low.	Moderate.
Loamy sand------	SP or SM.	A-2-----	10-30	10+	.07	5.6-5.8	High--------	Low.
Sandy loam to sandy clay loam.	SM or CL.	A-4 or A-6.	35-65	0.80-2.50	.11	5.6-6.8	Moderate to low.	Moderate.
Loamy sand------	SP or SM.	A-2-----	10-30	10+	.07	5.6-6.0	High--------	Low.
Sandy loam------	CL--------	A-4-----	55-65	0.80-2.50	.11	5.6-5.8	Moderate to low.	Moderate.

TABLE 5.--Brief description of soils and their

Map symbol	Soil name	Depth to seasonally high water table	Description of soil and site	Depth from surface
		Feet		Inches
Ok	Okenee loam.	0	12 to 24 inches of very poorly drained organic loam over 12 to 36 inches of sandy loam to sandy clay loam derived from beds of unconsolidated sandy loams and sandy clays on stream terraces.	0-22 22-55
OrA	Orangeburg loamy sand, 0 to 2 percent slopes.	5+	4 to 18 inches of well-drained loamy sand over 24 to 48 inches of sandy clay loam derived from beds of unconsolidated sandy loams and sandy clay loams.	0-13 13-66
OrB	Orangeburg loamy sand, 2 to 6 percent slopes.			
OrB2	Orangeburg loamy sand, 2 to 6 percent slopes, eroded.			
OrC	Orangeburg loamy sand, 6 to 10 percent slopes.			
OrC2	Orangeburg loamy sand, 6 to 10 percent slopes, eroded.			
OrD2	Orangeburg loamy sand, 10 to 15 percent slopes, eroded.			
Pr	Plummer-Rutlege loamy fine sands.	0	10 to 14 inches of poorly drained loamy fine sand over 12 to 24 inches of sand derived from beds of unconsolidated sands.	0-14 14-32
Pt	Portsmouth loam.	0	8 to 14 inches of very poorly drained organic loam over 16 to 30 inches of sandy clay loam derived from beds of unconsolidated sandy clays.	0-8 14-30
Ra	Rains sandy loam.	0	13 to 14 inches of poorly drained sandy loam over 18 to 24 inches of sandy clay loam derived from beds of unconsolidated sandy loams and sandy clay loams.	0-13 13-30
RuA	Ruston loamy sand, thick surface, 0 to 2 percent slopes.	5+	18 to 30 inches of well-drained loamy sand over 24 to 36 inches of sandy loam to sandy clay loam derived from beds of unconsolidated sandy clays.	0-20 20-46
RuB	Ruston loamy sand, thick surface, 2 to 6 percent slopes.			
RuC	Ruston loamy sand, thick surface, 6 to 10 percent slopes.			
RuD	Ruston loamy sand, thick surface, 10 to 15 percent slopes.			

estimated physical and chemical properties--Continued

Classification			Percentage passing sieve No. 200	Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
USDA texture	Unified	AASHO						
				Inches per hour	Inches per inch of soil	pH		
Loam----------	Pt--------	--------	35-75	0.80-2.50	0.11	4.3-4.6	Moderate----	Moderate.
Sandy loam to light sandy clay loam.	CL--------	A-4 or A-6.	55-65	0.05-0.80	.15	4.6	Low---------	Moderate.
Loamy sand------	SM--------	A-2-4---	15-30	2.50-5.00	.07	5.5	High--------	Low.
Sandy clay loam.	CL--------	A-6 or A-7.	50-65	0.20-0.80	.11	5.3-5.6	Moderate to low.	Moderate.
Loamy fine sand.	SP or SM.	A-2-----	10-30	5.00-10.00	.08	5.2-5.5	High--------	Low.
Sand----------	SP or SM.	A-3 or A-2.	5-30	5.00-10.00	.08	5.0-5.7	High--------	Low.
Loam----------	SM, Ml, or Pt.	A-4-----	35-75	0.80-2.50	.10	5.5-5.9	High--------	Low to moderate.
Sandy clay loam.	CL--------	A-4 or A-6.	55-65	0.20-1.50	.14	4.7-4.9	Moderate to low.	Moderate.
Sandy loam------	SM--------	A-4-----	30-40	2.50-5.00	.08	5.0-5.5	Moderate----	Low.
Sandy clay loam.	SM or SC.	A-4 or A-6.	40-50	0.20-0.80	.11	5.0-5.2	Moderate----	Low to moderate.
Loamy sand------	SP or SM.	A-2-----	10-30	10+	.07	5.6-6.0	High--------	Low.
Sandy clay loam.	SC--------	A-4-----	35-45	0.80-2.50	.10	5.3-5.7	Moderate----	Moderate.

TABLE 5.--Brief description of soils and their

Map symbol	Soil name	Depth to seasonally high water table	Description of soil and site	Depth from surface
		Feet		Inches
TfB	Tifton sandy loam, 2 to 6 percent slopes.	5+	10 inches of well-drained loamy sand over 24 to 30 inches of sandy clay loam to sandy clay derived from beds of unconsolidated sandy clays.	0-10 10-39
VaB	Vaucluse loamy sand, 2 to 6 percent slopes.	5+	8 to 12 inches of well-drained loamy sand over 12 to 18 inches of firm, compact or weakly cemented sandy clay loam or sandy clay derived from beds of unconsolidated sands and clays.	0-12 12-26
VaB2	Vaucluse loamy sand, 2 to 6 percent slopes, eroded.			
VaC	Vaucluse loamy sand, 6 to 10 percent slopes.			
VaC2	Vaucluse loamy sand, 6 to 10 percent slopes, eroded.			
VaD	Vaucluse loamy sand, 10 to 15 percent slopes.			
VaD2	Vaucluse loamy sand, 10 to 15 percent slopes, eroded.			
VaE2	Vaucluse loamy sand, 15 to 20 percent slopes, eroded.			
VtB	Vaucluse loamy sand, thick surface, 2 to 6 percent slopes.	5+	18 to 30 inches of well-drained loamy sand over 6 to 12 inches of firm, compact or weakly cemented sandy clay loam to sandy clay derived from beds of unconsolidated sands and clays.	0-30 30-36
VtC	Vaucluse loamy sand, thick surface, 6 to 10 percent slopes.			
VtD	Vaucluse loamy sand, thick surface, 10 to 15 percent slopes.			
Wc	Wehadkee and Chewacla silt loams.	0	6 to 10 inches of poorly drained silt loam over 14 to 18 inches of silty clay loam derived from beds of unconsolidated silts and clays washed from soils of the Piedmont Plateau and mountains and laid down as stream terraces.	0-7 7-24

estimated physical and chemical properties--Continued

Classification			Percentage passing sieve No. 200	Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
USDA texture	Unified	AASHO						
				Inches per hour	Inches per inch of soil	pH		
Loamy sand------	SP or SM.	A-2-----	10-20	2.50-5.00	0.08	5.5-5.7	High--------	Low.
Sandy clay loam to sandy clay.	SC--------	A-6-----	30-40	0.80-2.50	.11	5.3-5.5	Moderate----	Moderate.
Loamy sand------	SP or SM.	A-2-----	10-30	10+	.06	5.5-5.8	High--------	Low.
Sandy clay loam.	CL--------	A-4-----	55-65	0.05-0.20	.09	5.1-5.5	Low---------	Moderate.
Loamy sand------	SP or SM.	A-2-----	10-30	10+	.06	5.5-5.8	High--------	Low.
Sandy clay loam to sandy clay.	SC or CL.	A-4 or A-6.	35-65	0.05-0.20	.09	5.1-5.5	Moderate to low.	Moderate to high.
Silt loam-------	ML--------	A-4-----	90-100	0.20-0.80	.13	5.1-5.5	Moderate----	Moderate.
Silty clay loam.	CL--------	A-6 or A-7-6.	90-100	0.05-0.20	.13	5.1-5.5	Low---------	High.

Soil series and map symbol	Suitability to grading in winter and in wet weather	Suitability as a source of--			
		Topsoil	Sand	Road subgrade	Road fill
Caroline (CaB, CaB2, CaC, CaC2, CaD, CaD2, CaE2, CbB, CbC, CcC3).	Poor----------	Fair----------	Poor; poorly graded sand in surface layer.	Fair----------	Fair----------
Chewacla (Ch)------	Poor; high water table; overflow hazard.	Fair to good-----	Unsuitable-------	Poor----------	Poor----------
Congaree and Congaree-Chewacla (Cn, Co).	Poor; overflow hazard.	Fair to good-----	Unsuitable-------	Poor----------	Poor to fair; erodible.
Coxville (Cx)------	Poor; high water table.	Fair----------	Unsuitable-------	Fair----------	Poor to fair----
Dunbar (Du)--------	Poor; high water table.	Fair----------	Poor; poorly graded sand in surface layer.	Poor to fair---	Poor to fair----
Eustis (EmB, EmC, EmD, EsB, EsC, EsD).	Good----------	Poor----------	Fair to good; deep, poorly graded fine sand.	Poor; good if confined.	Fair; erodible--
Faceville (FaA, FaB, FaB2, FaC2).	Fair to good-----	Good----------	Poor; poorly graded sand in surface layer.	Good----------	Fair to good----
Goldsboro (Gb)-----	Fair----------	Fair----------	Poor; poorly graded sand in surface layer.	Fair to good---	Fair to good----

Suitability for septic disposal of sewage	Soil features affecting--					
	Farm ponds or sewage lagoons		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
	Reservoir area	Embankment				
Fair----------	Slow seepage--	Low strength and stability; slow permeability.	Not needed----	Slow infiltration; medium water-holding capacity.	Highly erodible.	Highly erodible.
Very poor; high water table much of the time.	Moderate seepage.	Low strength and stability; moderate permeability.	Seasonally high water table; moderate permeability.	Slow infiltration; high water-holding capacity.	Not needed----	No hazard.
Very poor; high water table much of the time; subject to overflow.	Moderately rapid seepage.	Low strength and stability; moderately rapid permeability.	Not needed----	Slow to moderate infiltration; medium water-holding capacity.	Not needed----	No hazard.
Poor; very slowly permeable subsoil; high water table.	Slow seepage--	Moderate strength and stability; slow permeability.	Seasonally high water table; slow permeability.	Slow infiltration; medium water-holding capacity.	Not needed----	No hazard.
Fair; slowly permeable subsoil; high water table some of the time.	Slow seepage--	Moderate strength and stability; moderately slow permeability.	Seasonally high water table; moderately slow to slow permeability.	Moderate infiltration; medium water-holding capacity.	Not needed----	No hazard.
Very good------	Excessive seepage.	Low strength and stability; very rapid permeability.	Not needed----	Rapid infiltration; low water-holding capacity.	Erodible on slopes.	Erodible and droughty; low fertility.
Fair to good---	Moderately slow seepage in subsoil.	Moderate to high strength and stability; moderately slow permeability.	Not needed----	Moderate infiltration; medium water-holding capacity.	Erodible on slopes.	Erodible on slopes.
Fair; internal drainage somewhat impeded.	Slow seepage--	Moderate to high strength and stability; moderate permeability in subsoil.	Natural drainage fairly adequate for most crops; moderate permeability.	Moderate to rapid infiltration; medium water-holding capacity.	Not needed----	No hazard.

TABLE 6.--Interpretation of engineering

Soil series and map symbol	Suitability to grading in winter and in wet weather	Suitability as a source of--			
		Topsoil	Sand	Road subgrade	Road fill
Grady (Gm, Gr)-----	Poor; high water table.	Fair to poor-----	Unsuitable-------	Poor----------	Poor----------
Greenville (GsA, GsB, GsB2, GsC2).	Fair to good-----	Good----------	Unsuitable-------	Fair to good---	Fair to good----
Izagora (Iz)-------	Fair to poor-----	Fair----------	Poor; poorly graded sand in surface layer.	Fair to poor---	Fair to poor----
Kalmia (Ka)--------	Good----------	Good----------	Poor; poorly graded fine sand in surface layer.	Fair to good---	Fair to good----
Killian (KbB, KbC, KbC2, KbD, KtB, KtC).	Poor; high content of kaolin clay.	Fair----------	Poor; poorly graded fine sand in surface layer.	Poor to fair---	Poor to fair----
Lakeland (La, LkB, LkC, LkD, LsA, LsB, LsC, LsD).	Good----------	Poor----------	Fair to good; deep, poorly graded sand.	Poor; good if confined.	Fair on gentle slopes; erodible.
Local alluvial land (Lv).	Poor----------	Variable but usually fair.	Unsuitable-------	Poor----------	Poor----------

properties of soils--Continued

Suitability for septic disposal of sewage	Soil features affecting--					
	Farm ponds or sewage lagoons		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
	Reservoir area	Embankment				
Very poor; high water table.	Slow seepage--	Moderate strength and stability; slow permeability.	Seasonally high water table; internal drainage needed.	Moderately slow infiltration; medium water-holding capacity.	Not needed----	No hazard.
Good----------	Moderately slow seepage.	Moderate strength and stability; moderate permeability.	Not needed----	Moderately slow infiltration; medium water-holding capacity.	Erodible on slopes.	Erodible on slopes.
Poor; slowly permeable subsoil; high water table part of the time.	Moderate seepage.	Moderate strength and stability; moderately slow permeability.	Moderately slow permeability.	Moderately slow infiltration; medium water-holding capacity.	Not needed----	No hazard.
Good----------	Moderate seepage.	Moderate to high strength and stability; moderately rapid permeability.	Not needed----	Moderately rapid infiltration; low to medium water-holding capacity.	Not needed----	No hazard.
Fair; compact sandy clay in subsoil.	Slow seepage in subsoil.	Moderate to high strength and stability; slow permeability.	Hillside seepage and seasonally high water table along natural drains.	Moderate infiltration; medium water-holding capacity.	Erodible on slopes.	Erodible on slopes.
Very good------	Excessive seepage.	Low to moderate strength and stability; very rapid permeability.	Not needed----	Rapid to very rapid infiltration; low water-holding capacity.	Erodible on slopes.	Erodible where sloping; droughty; low fertility.
Poor----------	Rapid seepage.	Low to moderate strength and stability; variable but generally moderate permeability.	Seasonally high water table.	Moderate infiltration; medium water-holding capacity.	Not needed----	No hazard.

properties of soils--Continued

Suitability for septic disposal of sewage	Soil features affecting--					
	Farm ponds or sewage lagoons		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
	Reservoir area	Embankment				
Poor; high water table at times.	Slow to moderate seepage.	Moderate strength and stability; moderate to moderately slow permeability.	Seasonally high water table; moderate to moderately slow permeability.	Moderate infiltration; medium water-holding capacity.	Not needed----	No hazard.
Good----------	Moderately slow seepage in subsoil.	Moderate to high strength and stability; moderate permeability.	Not needed----	Moderate infiltration; medium water-holding capacity.	Erodible on slopes.	Erodible on slopes.
Good----------	Moderately slow seepage in subsoil.	Moderate to high strength and stability; moderately slow permeability in subsoil.	Not needed----	Moderate infiltration; medium water-holding capacity.	Erodible on slopes.	Erodible on slopes.
Poor----------	Rapid seepage.	Very low strength and stability; variable but generally moderate permeability.	High water table.	Variable but generally moderate infiltration; variable but generally medium water-holding capacity.	Not needed----	No hazard.
Very poor; high water table much of the time.	Slow to moderate seepage in subsoil.	Low to moderate strength and stability; moderately slow permeability in subsoil.	High water table; moderately slow permeability.	Slow to moderate infiltration; low to medium water-holding capacity.	Not needed----	No hazard.
Good----------	Moderate seepage.	Moderate to high strength and stability; moderate permeability.	Not needed----	Rapid infiltration; medium water-holding capacity.	Erodible on slopes.	Erodible on slopes.

TABLE 6.--Interpretation of engineering

Soil series and map symbol	Suitability to grading in winter and in wet weather	Suitability as a source of--			
		Topsoil	Sand	Road subgrade	Road fill
Lynchburg (Ly)-----	Poor; high water table.	Fair----------	Unsuitable-------	Fair----------	Fair----------
Magnolia (MaB3, MaC3, MaD3, MgA, MgB, MgB2, MgC, MgC2, MgD2).	Good----------	Good----------	Poor; poorly graded fine sand in surface layer.	Fair to good---	Fair to good----
Marlboro (MrA, MrB).	Fair----------	Good----------	Poor; poorly graded fine sand in surface layer.	Fair to good---	Fair to good----
Mixed alluvial land (Mx).	Poor; high water table; overflow hazard.	Poor----------	Unsuitable-------	Poor----------	Poor----------
Myatt (My)---------	Poor; high water table.	Poor----------	Unsuitable-------	Fair----------	Fair----------
Norfolk (NfA, NfB, NfB2, NfC, NoA, NoB, NoC, NtB, NtB2, NtC).	Good----------	Good----------	Poor; poorly graded sand in surface layer.	Good----------	Good----------

TABLE 6.--Interpretation of engineering

Soil series and map symbol	Suitability to grading in winter and in wet weather	Suitability as a source of--			
		Topsoil	Sand	Road subgrade	Road fill
Okenee (Ok)--------	Poor; high water table.	Fair; high organic content in surface layer.	Unsuitable-------	Poor; unsuitable organic material.	Unsuitable above 2 feet; poor below.
Orangeburg (OrA, OrB, OrB2, OrC, OrC2, OrD2).	Good----------	Good----------	Poor; poorly graded sand in surface layer.	Good----------	Good----------
Plummer (Pr)-------	Poor; high water table.	Poor----------	Unsuitable-------	Fair----------	Poor to fair; erodible.
Portsmouth (Pt)----	Poor; high water table.	Fair to good; high organic content.	Unsuitable-------	Poor; unsuitable organic material.	Unsuitable above 1 foot; poor below.
Rains (Ra)---------	Poor; high water table.	Fair----------	Unsuitable-------	Fair----------	Fair----------
Ruston (RuA, RuB, RuC, RuD). [1/]	Good----------	Good----------	Poor; poorly graded sand in surface layer.	Good----------	Good----------
Sandy and clayey land, sloping, and Sandy and clayey land, moderately steep (SaD, SaE).	Variable---------	Poor----------	Unsuitable-------	Variable-------	Variable--------

properties of soils--Continued

Suitability for septic disposal of sewage	Soil features affecting--					
	Farm ponds or sewage lagoons		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
	Reservoir area	Embankment				
Very poor; high water table much of the time.	Slow seepage in subsoil.	Unsuitable organic material; low strength and stability; slow to moderately slow permeability.	High water table; slow to moderately slow permeability in subsoil.	Moderate infiltration; medium to high water-holding capacity.	Not needed----	No hazard.
Good----------	Moderate seepage in subsoil.	Moderate to high strength and stability; moderate permeability.	Not needed----	Moderately rapid infiltration; medium water-holding capacity.	Erodible on slopes.	Erodible on slopes.
Very poor; high water table much of the time.	Moderate seepage in subsoil.	Low strength and stability; rapid permeability.	High water table; rapid permeability; poor soil for agriculture.	Low water-holding capacity.	Not needed----	No hazard.
Very poor; high water table much of the time.	Slow to moderate seepage in subsoil.	Unsuitable organic material; low strength and stability; moderate permeability.	High water table; moderate permeability in subsoil.	Moderate infiltration; medium water-holding capacity.	Not needed----	No hazard.
Very poor; high water table much of the time.	Slow to moderate seepage.	Moderate strength and stability; moderately slow permeability.	Seasonally high water table; moderately slow permeability.	Moderate infiltration; medium water-holding capacity.	Not needed----	No hazard.
Good----------	Moderate seepage.	Moderate to high strength and stability; moderate permeability.	Not needed----	Moderately rapid infiltration; medium water-holding capacity.	Erodible on slopes.	Erodible on slopes.
Variable-------	Variable------	Variable------	Not needed----	Poor agricultural land.	Erodible------	Erodible.

TABLE 6.--Interpretation of engineering

Soil series and map symbol	Suitability to grading in winter and in wet weather	Suitability as a source of--			
		Topsoil	Sand	Road subgrade	Road fill
Tifton (TfB)-------	Good----------	Good----------	Poor; poorly graded sand in surface layer.	Good----------	Good----------
Vaucluse (VaB, VaB2, VaC, VaC2, VaD, VaD2, VaE2, VtB, VtC, VtD).	Good----------	Poor----------	Poor; poorly graded sand in surface layer.	Fair to good---	Fair to good----
Wehadkee and Chewacla (Wc).	Poor; high water table; overflow hazard.	Poor----------	Unsuitable-------	Poor----------	Poor----------

1/ Faceville soils are mapped separately and with Ruston soils in undifferentiated soil groups (FrA, FrB,

properties of soils--Continued

Suitability for septic disposal of sewage	Soil features affecting--					
	Farm ponds or sewage lagoons		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
	Reservoir area	Embankment				
Good----------	Moderate seepage in subsoil.	Moderate to high strength and stability; moderate permeability.	Not needed----	Moderate infiltration; medium water-holding capacity.	Erodible on slopes.	Erodible on slopes.
Fair; slowly permeable subsoil.	Moderate to rapid seepage.	Moderate strength and stability; slow to rapid permeability.	Not needed----	Moderate infiltration; low water-holding capacity; compact subsoil.	Erodible on slopes.	Erodible on slopes.
Very poor; high water table; subject to overflow.	Slow seepage--	Low strength and stability; slow permeability.	High water table; surface and internal drainage needed; subject to overflow.	Slow infiltration; high water-holding capacity.	Not needed----	No hazard.

FrB2, FrC, FrC2, FrD2). For either component of this group, refer to the corresponding series in this table.

Department of Agriculture, and according to the Unified and AASHO systems. The percentage of material that passes through a No. 200 sieve is listed in table 5. All soils in the county consist of material finer than the openings of a No. 4 sieve, and only the Killian soils retain any material on the No. 10 sieve. The No. 10 sieve passes 95 to 100 percent of the material of the Killian soils.

Permeability refers to the rate that water moves through soil material. It depends largely on the texture and structure of the soil. Permeability of the soil material was estimated for uncompacted soil (13). The estimates were based on soil structure and were compared with the results of permeability tests made on undisturbed cores of material from the B horizon in similar soils.

Available water capacity is the amount of water a soil can hold available for plants. It is the water held in the range between field capacity and wilting point.

Reaction is listed in pH values, which indicate the degree of acidity and alkalinity of the soil. Dispersion is the rate that soil aggregates break down into individual particles and thereby lose stability. Sands and other soil materials with a large percentage of coarse particles have a fast rate of dispersion.

The shrink-swell potential indicates how much a soil changes in volume when its moisture content changes. It is estimated primarily on the basis of the amount and kind of clay the soil contains. In general, soils classified as CH and A-7 have a high shrink-swell potential; clean sands and gravel (single-grain structure) have a low shrink-swell potential.

Engineering interpretations

In table 6 (see page 64) are estimates of the suitability of the soils for winter grading, as sources of material for highway construction, and for septic tanks. Also listed are features that affect the construction of farm ponds or sewage lagoons, agricultural drainage structures, irrigation structures, terraces and diversions, and waterways. The estimates in table 6 are based on the test data in table 4, on the descriptions of the soils and the soil properties given in table 5, and on actual field experience and performance. Borrow pits and Swamp are not rated in table 6.

The suitability of soils for grading in winter or in wet weather depends on the texture of the soil material and on the depth to the water table. Plastic, clayey soils are poor for winter grading because they are difficult to handle when they are wet. They ought to be dried to a proper moisture content before they are compacted. Frozen clayey soils may be difficult to excavate and should not be used in road sections where compaction is needed.

The suitability of soils as a source of topsoil is evaluated on the basis of quality and quantity. Most of the soils in the county are poor or unsuitable sources of sand. Ratings for road subgrade are based on the texture of the soil material. For example, soils that have plastic clay layers are rated poor because those layers impede internal drainage and have low stability when wet. Sandy clay soils are rated good because they are moderately permeable and have high strength and stability.

The suitability of the soil material for road fill depends largely on the water content and texture of the soil. Plastic soils with a high water content are poor for fill because they are difficult to handle, to dry, and to compact. Highly erodible soils, such as those composed primarily of fine sands or silts, are poor to fair. Road fill made of highly erodible soils can be kept from eroding by controlling moisture during compaction, building a fill with gentle slopes, and protecting side slopes with fast-growing vegetation.

Deep sands and other soils with rapid permeability and a low water table are rated well suited for septic disposal of sewage. Rated poorly suited are soils that have a high content of clay and slow permeability, or a high water table.

Resistance to seepage is the main feature that determines the choice of soils for the reservoir area of farm ponds or sewage lagoons. The amount of seepage that can be permitted depends on the inflow of water.

Among the features of soils that make irrigation difficult are slow infiltration, low water-holding capacity, and shallow soil. Terracing is needed on all soils listed in table 6 except those designated not needed. Terracing deep sands is hazardous unless vegetation is maintained. Before constructing the terraces, grassed waterways should be established.

Conservation engineering

In planning conservation engineering practices on farms in the county, a study of the engineering properties given in tables 5 and 6 is helpful. Good drainage systems are essential to efficient farming in the Coastal Plain area of Calhoun County. Much has been done to improve the drainage, but additional outlets, tile drains, and ditches are needed.

Outlets.--Adequate outlets are required for good drainage, and they can be provided by the many small streams or draws in the county. In some parts of the county, however, small, oval depressions have no natural drainage outlets. These areas occur throughout soil associations 4, 5, and 6. (See the general soil map at the back of this report.) In many of these areas draglines have been used to dig ditches that are outlets for smaller open ditches or for tile drains that lead from the depressions.

Tile drains.--Many of the soils in Calhoun County can be drained with tile if outlets can be provided through open dragline ditches or streams. Most soils with a permeability rating of 0.05 or more inches of water per hour are suitable for tile drains.

Drainage ditches.--Generally, drainage ditches are excavated with draglines and are trapezoidal in shape. They have a minimum depth of 4 feet and sides that rise 1/2 or 1 foot in 1 foot of horizontal distance.

V-type and W-type ditches.--These ditches are used to improve surface drainage of the Congaree and other soils on the bottom lands of the Congaree River. They collect water from rows, row ditches, or smooth surfaces of fields. Because they are generally shallow and have flat side slopes they can be crossed with farm machinery and are easy to maintain.

The V-type ditch is shaped like the letter V and his minimum side slopes that rise 1 foot in 4 feet of horizontal distance. Water cannot drain readily into the V-type ditch, however, unless the material that is dug from the ditch is leveled or provided with special inlets.

To construct a W-type ditch, the material dug from two parallel V-type ditches is moved toward the center. The area between the ditches is thus raised and can be drained by both ditches. The raised center can be cultivated or used as a road or turnrow.

On most cultivated soils in soil associations 4 and 5, a complete program of soil and water conservation is needed to reduce erosion and to dispose of excess water. Fields are large and tend to become even larger. They are suitable for a conservation program that provides terracing, waterways, and supporting agronomic practices that help hold soil loss to a minimum.

Terraces and waterways.--Terraces and waterways are important to conservation engineering in this county. Channel-type gradient terraces are most suitable. The terraces can be constructed so that they drain from the ridges into available natural depressions, which can be vegetated for protection.

Where the soil is deep enough, it should be smoothed to improve terrace alinement and row drainage. Parallel terraces, or those made as nearly parallel as possible, are well suited to the type of farming that is practiced. Because four-row equipment is commonly used, a terrace should have good alinement and mild curves, and its base should be broad and its slopes nearly flat. To improve alinement in small depressions that can be crossed with farm equipment, it is generally necessary to construct a trapezoidal waterway with flat side slopes. Vegetation is needed in these waterways, and maintenance is required until vegetation is adequately established.

Farmers in this county do not ordinarily irrigate their fields, build farm ponds, level their land, or use practices other than drainage, terraces, and waterways. In soil associations 4 and 5, however, many dams have been built to provide water for livestock, fish production, and recreation.

Use of Soils for Wildlife [6]

This subsection was written to help those who manage soils to attract wildlife. The soils of Calhoun County are placed in five groups according to their suitability for growing wildlife food and cover, and management of these groups of soils is discussed. Each wildlife suitability group is made up of soils that can support about the same number and kind of wildlife and that respond to management in about the same way.

The suitability of soils for wildlife management depends on (1) their productivity of native or planted food and cover, (2) their wetness or dryness, (3) their location in respect to overflow or severe erosion, and (4) their suitability for practices and structures needed in wildlife management.

In table 7 the kinds of wildlife common in the county are rated according to their suitability to each group of soils. The ratings in this table were based largely on the judgment of biologists, soil scientists, and soil conservationists. They represent the best information now available.

WILDLIFE SUITABILITY GROUP 1

The soils in this group support wildlife in greater number and kind than do the soils of any other wildlife group in the county. Management is generally easier and is more likely to succeed. Soils in the following series and a land type make up this group--

Caroline.	Local alluvial land.
Congaree.	Magnolia.
Faceville.	Marlboro.
Faceville and Ruston.	Norfolk.
Greenville.	Orangeburg.
Kalmia.	Ruston.
Killian.	Tifton.

These soils are suited to plants that furnish food and cover for deer, dove, duck, quail, rabbit, squirrel, and wild turkey. The soils are well suited to perennial legumes. Ponds can be built and stocked with fish.

Deer.--The soils in this group are well suited to grasses and legumes that deer prefer for food. White clover, crimson clover, and rescuegrass furnish good food in winter. Fields of these crops seeded to attract deer should be 1 to 5 acres in size. Liming and fertilizing make these plants more palatable and attractive. The stands of mixed hardwoods on these soils are good habitats for deer and provide many kinds of natural food.

Dove.--By seeding browntopmillet, excellent dove fields can be made economically on these soils. Because doves do not scratch for their food, the millet ought to be in rows so that the grain falls on the bare ground between the rows. Seeding should be between mid-June and mid-July at a rate of about 10 pounds per acre in rows 36 to 42 inches wide. Yields have been increased by adding fertilizer. In fall and winter, doves also feed on waste corn and soybeans in fields that have been hogged down or harvested with a mechanical harvester.

Duck.--Except for a few level areas that can be diked and flooded, the soils in this group generally are not suitable for duck fields. The few areas that can be diked are planted and then flooded in winter by pumping water from wells or from other sources.

[6] By WILLIAM W. NEELY, biologist, and CARL B. LAWRENCE, soil scientist, Soil Conservation Service.

Table 7.--Suitability of soils for wildlife

Kinds of wildlife	Wildlife suitability group				
	1	2	3	4	5
Deer	Well suited	Suited	Well suited	Well suited	Well suited.
Dove	Well suited	Not well suited	Well suited	Not well suited	Not suited.
Duck in fields	Not well suited	Not suited	Suited	Well suited	Suited.
Duck in woodland ponds.	Not well suited	Not suited	Well suited	Well suited	Suited.
Fish in impounded ponds.	Well suited	Suited	Suited	Not well suited	Not suited.
Fish in dug ponds	Not suited	Not suited	Well suited	Not well suited	Not suited.
Fox	Well suited	Well suited	Well suited	Not suited	Not suited.
Opossum	Well suited	Suited	Suited	Not suited	Not well suited.
Quail	Well suited	Suited	Suited	Not well suited	Not suited.
Rabbit	Well suited	Not well suited	Suited	Not well suited	Not suited.
Raccoon	Suited	Not well suited	Suited	Well suited	Suited.
Squirrels (gray and fox).	Suited	Not well suited	Suited	Well suited	Well suited.
Snipe	Not suited	Not suited	Not well suited	Well suited	Not suited.
Wild geese	Not well suited	Not suited	Well suited	Suited	Not suited.
Wild turkey	Well suited	Not well suited	Suited	Well suited	Well suited.
Game on farms (put-and-take shooting					

Fish.--Some of the best sites for fishponds in the county are in valleys and draws in soils of this group. These soils also provide good material for building the dams that impound water in the valleys and draws. Watersheds from which water drains into the ponds should be small. Shallow water can be prevented by clearing the basin of trees and by deepening or filling edges of the ponds. Adding fertilizer regularly between February and October reduces pondweeds and increases the production of fish. Before stocking the ponds, rough fish should be killed by treating the water with rotenone. A suitable stocking rate is 1,000 bluegill and 100 bass fingerlings per acre.

Quail (bobwhite).--Bicolor lespedeza is suited to these soils and is a dependable food for quail. It can be seeded or planted in strips along the edges of fields or in openings of woods. The strips should consist of 5 rows about 350 feet long and 3 feet apart. Plants are more satisfactory than seed. Yields have been increased by adding fertilizer at planting, and again every third year. Also suited to the soils in this group are perennial tickclover and annuals such as browntopmillet and annual lespedeza.

If increasing quail in woodland is important, the habitat can be improved by burning. Burning removes the duff and, by controlling hardwood sprouts, keeps areas open for shooting.

Rabbit.--These soils are the best in the county for rabbits. Planting generally is not needed, for rabbits eat many different kinds of plants that grow naturally on these soils. Also, rabbits are protected from predators by living fences of multiflora rose and by many other thorny plants.

Squirrel.--Some of the woods on these soils are habitats for gray and fox squirrels. The number of squirrels in the woodland depends on how many hardwoods are growing among the pine. Squirrels seldom can be found in forests that are predominantly pine. Trees that produce natural food for squirrels on the soils in this group are beech, black cherry, dogwood, hickory, oak, pecan, and pine. Corn is the farm crop eaten most often by squirrels.

Wild turkey.--The soils of this group are suited to grasses and legumes that furnish food for wild turkeys. Suitable for winter food are white clover, crimson clover, and rescuegrass. These plants should be planted in fields that are 1 to 5 acres in size and not more than half a mile from water. Bahiagrass provides abundant food in August and September and can be planted in firebreaks or on the shoulders of roads leading into the woods. In these woods turkeys find natural food. About 25 percent of their food between October and March is acorns, and 1 to 15 percent is dogwood berries between September and April. The wild turkeys, however, prefer beechnuts, but these nuts are not plentiful.

WILDLIFE SUITABILITY GROUP 2

The soils in this group produce only small amounts of native plants suitable for wildlife food, and in many places suitable cover is lacking. Consequently, many kinds of wildlife are scarce. To encourage animals and birds, perennials suitable for food should be planted and fertilized heavily each year. Soils in the following series and a land type make up this group--

Eustis.	Sandy and clayey land.
Lakeland.	Vaucluse.

These soils are suited to perennial legumes and other plants that furnish food and cover for

deer, dove, duck, quail, rabbit, squirrel, and wild turkey. Also, ponds can be built and stocked with fish.

Deer.--The soils in this group are the poorest in the county for deer. Deer, however, can be attracted if plants suitable for deer food are grown and the soils are well managed. Suitable plants and good management are required on these soils because, generally, areas are large and soils better suited to deer food are far away. The plants best suited as deer food are reseeding crimson clover and chufa. These crops should be replanted if the stands die out.

Dove.--These soils generally are not suitable for plantings made especially for dove. The doves, however, eat watermelon seeds if the waste melons are left on the field after the crop is harvested.

Duck.--Though some areas are flat enough for flooding, these soils are so porous that the shallow flooding required for duckponds is not possible.

Fish.--In some draws and valleys on these soils, fishpond sites are good and there is enough flowing water to keep the ponds filled. Lacking, however, is impervious material for building dams. If it is to hold water, the dam must be keyed and cored with material more impervious than that in these soils. The pond water probably is slightly acid or deficient in calcium, and if it is, fish grow slowly unless the pond is limed. In other respects, management for fish should be like that for ponds on the soils in group 1.

Game for put-and-take shooting.--The soils in this group are the best in the county for commercial preserves where game is regularly released for hunters. Because the soils are permeable and quickly absorb water, hunters lose little time after a rain. The shooting areas can be kept open easier on these soils than on finer textured ones because vegetation grows more slowly. Native stands of wiregrass are plentiful and are good places to release the birds. Though establishing some plants is difficult, grain sorghum and sundangrass generally grow if very large amounts of a complete fertilizer are applied. Mallards can be released at the many ponds on these soils.

Quail (bobwhite).--Although these soils can produce food and cover for many quail, much more intensive management is needed than on the soils in group 1. Because the soils are droughty, annuals are likely to fail in 1 year out of 3 and, consequently, cannot be depended on for quail food. Perennials are better. Bicolor lespedeza is a dependable perennial if it is fertilized every year. Transplanting lespedeza is more satisfactory than seeding.

Rabbit.--Although cover suitable for protecting rabbits is generally lacking on these soils, it can be supplied by small plantings of thorny vegetation. Then the rabbits increase because they have more protection from predators.

Squirrel.--On these soils are blackjack, turkey, post, and other oaks that grow on sandy soils, but these trees do not produce enough acorns for squirrels to make the stands their permanent habitats. Also, pine trees do not produce enough cones. Fox squirrels use areas of these soils more than do gray squirrels.

Wild turkey.--Plantings of crimson clover and chufa on these soils attract wild turkeys. The turkeys, however, do not increase unless the soils in group 4 or 5 occur within half a mile.

WILDLIFE SUITABILITY GROUP 3

The soils in this group are nearly level and generally wet, but they are highly productive when drained. If food crops are grown for wildlife, the wet areas should be drained or the better, naturally drained areas must be chosen. Soils of the following series make up the group--

Chewacla.	Goldsboro.
Congaree-Chewacla.	Izagora.
Dunbar.	Lynchburg.

These soils are suited to perennial legumes and other plants that furnish food and cover for deer, dove, duck, quail, rabbit, squirrel, wild geese, and wild turkey. Also, ponds can be built and stocked with fish.

Deer and dove.--These animals and birds can be attracted by planting and managing the soils in this group in the same way as those in group 1.

Duck.--These nearly level soils provide excellent sites for duck fields. Drained areas can be diked and planted to corn, which is the most suitable food on these soils for duck. It is necessary to flood the fields during fall and winter, generally by pumping water from a source nearby. In some places a reservoir can be constructed above a duck field to store water for flooding. Browntopmillet, Japanese millet, and smartweed are choice duck foods suited to these soils.

Some of the low-lying, wooded areas on these soils produce wood products and provide good sites for duckponds as well. For duckponds, choose a flat, wooded draw that is several acres in size and that can be flooded with water, 1 to 15 inches or more deep. The water can be controlled by a dike with a water-control structure built at one end of the draw. By opening the water-control structure in spring and summer, the duckpond can be drained. The wooded areas should be flooded only in winter. Flooding the year round may kill the trees and encourage the growth of useless weeds that clog the shallow water. Winter flooding encourages the growth of commercial hardwoods, but it kills the pines, and these trees should be removed. The ducks like acorns and beechnuts, and where the tree canopy is open, they eat smartweed and panicgrass. Cleared areas can be planted to browntopmillet or smartweed.

Fish.--Fishponds can be built on these soils by impounding water, but in many places an impounded pond would have too much shallow water or too large a watershed. Ponds constructed on the soils of this group should be stocked and managed in the same way as those on the soils in group 1.

In many places ponds are dug in these soils for the dual purpose of supplying irrigation water and producing fish. The water in many of them is too acid, however, because sulfuric acid forms in the

spoilbanks that are generally left beside the ponds, and this acid is washed into the water after rains. Then, if the acidity is corrected by liming, the water is likely to damage tobacco and other irrigated crops. Fishponds that are dug should be shallower than irrigation ponds so that the digging does not penetrate the acid-forming materials in the low substratum.

Quail (bobwhite).--With adequate drainage, these soils have about the same suitability for quail as those in group 1. The best place for strips of bicolor lespedeza is along or near drainage ditches. Unless these soils are drained, only a few plants suitable for quail food can be grown. Among them are browntopmillet and sesbania planted in adjacent strips. The millet furnishes food early in fall, and the sesbania seeds drop later in winter. In some undrained areas during heavy or prolonged rains, nesting quail may be driven from their nests before the eggs hatch.

Rabbit.--Few rabbits live on these wet soils. The rabbits do not thrive, though suitable food and cover are available.

Squirrel.--The soils in this group are not suited to so many kinds of trees and other plants that supply natural food for squirrels as the soils in group 1. The two groups, however, are managed in the same way.

Wild geese.--Pasture for wild geese can be seeded in areas of these soils next to large ponds or lakes. In these areas a plant should be grown that is green in winter rather than one that produces seed. Wild geese prefer wheat to other foods.

Wild turkey.--To attract wild turkey, the same management is needed on the soils in this group as is needed on the soils in group 1.

WILDLIFE SUITABILITY GROUP 4

Most of the soils in this group are poorly suited to crops and pasture and have been left in woodland. The soils are wet and difficult to drain, but cleared areas can be managed so that they provide some of the best sites in the county for waterfowl. Well-managed uncleared areas make excellent habitats for deer, wild turkey, and squirrel. Soils of the following series make up this group--

Coxville.
Grady.
Portsmouth.

These soils are suited to plants that furnish food and cover for deer, duck, squirrel, snipe, wild geese, and wild turkey. The soils are not suited to perennial legumes. Dove, quail, and rabbit do not find suitable habitats, and the soils are generally not suitable for fishponds. Impounding water deep enough for fish is difficult.

Deer.--On the soils in this group, native trees and other plants that furnish food for deer are water oak, red maple, blackgum, blackberry, grasses, herbs, greenbriar, switchcane, and white bay. After the trees are harvested, new browse grows in the sunlit openings. Oak trees that bear acorns heavily should be left standing. If competing plants are destroyed, the production of acorns is increased. On these soils cattle and hogs compete with deer for food.

Duck.--Excellent duck fields can be made in some areas of these soils if these areas are diked and a water-control structure is provided to permit flooding in winter and draining in summer. The field should be kept dry enough in summer to support farm machines. Browntopmillet and Japanese millet, which are choice food for ducks, are well suited to these soils. The millet can be planted about mid-July at the rate of 20 to 25 pounds of seed per acre. Yields can be increased by adding a complete fertilizer. Smartweed, another choice duck food native to these soils, grows well when practices of soil and water management are used. Because cattle dislike smartweed, they eat the other kinds of plants and permit smartweed to grow if they graze the duck field only moderately. Thus, cattle can graze the duck fields in spring and summer, and the ducks can feed in fall and winter. Regardless of the kind of plants grown, the field must be flooded to a depth of 8 to 12 inches during fall and winter.

Good sites for duckponds also occur in woodland on the soils in this group. The ducks can be attracted and the duckponds managed in the same way as those on the soils in group 3.

Squirrel.--Blackgum, magnolia, and oak produce choice food for squirrels in winter. The squirrels eat buds and bark of hardwoods early in spring and eat maple seeds in spring and summer. Ample dens are available in the cavities of old trees. On these soils gray squirrels are more abundant than fox squirrels.

Snipe.--These soils have good areas for establishing snipe fields. The fields can be made by diking a level area and providing a water-control structure. The snipe eat mainly earthworms, univalves, crustacea, and other small animals that thrive in soils containing large amounts of organic matter. Grasses and sedges growing in the field provide this organic matter. If the field is disked or the grasses and sedges are chopped into the soil with a rotary chopper in September or October, the field will be open and organic matter will be added to these soils. Shallow flooding or puddling is necessary in fall and winter.

Wild geese.--Geese feed in the duck fields established on soils of this group. Their main food consists of the green, aquatic plants that grow in the duck fields.

Wild turkey.--Flocks of wild turkey live in many small areas of these soils. To provide food and cover for the turkeys, these areas should be managed in the same way as areas managed for deer. Acorns are an important food in winter. Panicgrass and paspalum grow in openings made by logging operations and provide food between July and October. These grasses also attract grasshoppers and crickets, which are the best food for turkeys, particularly young ones. Turkeys favor roosting places on these soils where water stands much of the time. The turkeys generally nest on

slightly higher soils within a few hundred feet of these wet areas.

WILDLIFE SUITABILITY GROUP 5

The soils in this group are difficult to manage for wildlife. Although these soils provide favorable natural habitats for deer, squirrel, and wild turkey, agricultural crops planted for wildlife food are generally not suited unless the soils are intensively diked and drained. The native vegetation, however, can be improved for all kinds of wildlife except duck. Soils in this group are in the following series and land types--

Mixed alluvial land.	Rains.
Myatt.	Swamp.
Okenee.	Wehadkee and Chewacla.
Plummer-Rutlege.	

These soils are suited to plants that furnish food and cover for deer, duck, squirrel, wild turkey, and nongame birds. The soils are not suited to perennial legumes. Dove and quail do not find suitable habitats, and rabbits are scarce. Increasing the number of rabbits is not worthwhile, because the soils are generally too wet for hunting. In a few places ponds can be built and stocked with fish.

Deer.--Management for deer should be the same on these soils as on the soils in group 4.

Duck.--Because water is difficult to control on the soils in this group, not many sites for duck fields are available. Many areas do not have outlets suitable for draining the fields. Areas with outlets may be diked, planted, and managed for ducks in the same way as are the soils in group 4. Woodland sites that cannot be drained well enough for planting may be used for duckponds and managed the same way as the soils in group 3.

Fish.--Few sites are available on these soils for impounding water to make fishponds. If water were impounded, the ponds in most areas would be too shallow and pondweed would invade. Also, the watersheds leading to these areas are so large that the ponds would be hard to manage for producing fish. Ponds that supply irrigation water occur, but they cannot be successfully stocked with fish. Water from adjacent areas is likely to cause overflow and to bring in rough fish or permit stocked fish to escape.

Squirrel and wild turkey.--To attract squirrel and wild turkey, the soils in this group should be managed in the same way as the soils in group 4.

Nongame birds.--Among other birds in the county are the black-crowned night heron, great horned owl, white-eyed vireo, prothonotary warbler, and pileated woodpecker.

Descriptions of Soils

This section describes, in nontechnical language, the soil series (groups of soils) and single soils (mapping units) of Calhoun County. The acreage and proportionate extent of each mapping unit are given in table 8.

The procedure in this section is first to describe the soil series, and then the mapping units in that series. Thus, to get full information on any one mapping unit, it is necessary to read the description of that unit and also the description of the soil series to which it belongs. As mentioned in the section "How Soils Are Named, Mapped, and Classified," not all mapping units are members of a soil series. Borrow pits and Swamp are miscellaneous land types and do not belong to a soil series but, nevertheless, are listed in alphabetic order along with the soil series.

Following the name of each mapping unit, there is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of each description of a mapping unit are the capability unit and the woodland suitability group in which the mapping unit has been placed. The page on which each capability unit is described can be found readily by referring to the "Guide to Mapping Units" at the back of the report.

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

Borrow Pits

Borrow pits are open excavations from which soil and underlying material have been removed for road fill and surfacing.

Borrow pits (Bp).--These manmade pits have little, if any, economic use and generally grow up in pine trees or other wild plants. They are generally drained to prevent standing water. Some pits possibly can be used as building sites, for pasture, or for irrigation ponds. They have not been placed in a woodland suitability group. (Capability unit VIIs-2)

Caroline Series

In the Caroline series are well-drained, slowly permeable, strongly acid soils on slopes of 2 to 5 percent. These soils of the Coastal Plain have developed on clay beds of the higher uplands. The surface layer is dark grayish-brown loamy sand. The subsoil is red or yellowish-red sandy clay to clay mottled with brown and has subangular blocky structure.

The Caroline soils commonly adjoin the Ruston, Faceville, Magnolia, and Vaucluse soils, and in some ways resemble them but are finer textured. They are not so friable in the subsoil as the Faceville and Magnolia soils and are less red than the Magnolia soils. Caroline soils have a stronger, subangular blocky structure than the Vaucluse soils and are not so hard when dry nor so firm when moist.

In this county, the Caroline soils extend mainly across the central part; the largest acreage is west and southwest of St. Matthews. The native vegetation was mixed stands of pines and hardwoods. Much of the acreage is wooded, and a considerable

TABLE 8.--Approximate acreage and proportionate extent of soils

Soil	Area	Extent
	Acres	Percent
Borrow pits	103	(1/)
Caroline loamy sand, 2 to 6 percent slopes	812	0.3
Caroline loamy sand, 2 to 6 percent slopes, eroded	562	.2
Caroline loamy sand, 6 to 10 percent slopes	433	.2
Caroline loamy sand, 6 to 10 percent slopes, eroded	1,070	.4
Caroline loamy sand, 10 to 15 percent slopes	305	.1
Caroline loamy sand, 10 to 15 percent slopes, eroded	350	.1
Caroline loamy sand, 15 to 25 percent slopes, eroded	501	.2
Caroline loamy sand, thick surface, 2 to 6 percent slopes	779	.3
Caroline loamy sand, thick surface, 6 to 10 percent slopes	417	.2
Caroline sandy clay loam, 6 to 10 percent slopes, severely eroded	220	.1
Chewacla silt loam	2,972	1.2
Congaree silt loam	3,736	1.5
Congaree-Chewacla silt loams	672	.3
Coxville sandy loam	4,386	1.8
Dunbar sandy loam	814	.3
Eustis loamy sand, 0 to 6 percent slopes	5,671	2.4
Eustis loamy sand, 6 to 10 percent slopes	2,588	1.1
Eustis loamy sand, 10 to 15 percent slopes	1,049	.4
Eustis sand, 0 to 6 percent slopes	2,571	1.1
Eustis sand, 6 to 10 percent slopes	2,013	.8
Eustis sand, 10 to 15 percent slopes	679	.3
Faceville loamy fine sand, 0 to 2 percent slopes	428	.2
Faceville loamy fine sand, 2 to 6 percent slopes	902	.4
Faceville loamy fine sand, 2 to 6 percent slopes, eroded	438	.2
Faceville loamy fine sand, 6 to 10 percent slopes, eroded	288	.1
Faceville and Ruston soils, 0 to 2 percent slopes	2,088	.9
Faceville and Ruston soils, 2 to 6 percent slopes	6,877	2.9
Faceville and Ruston soils, 2 to 6 percent slopes, eroded	1,719	.7
Faceville and Ruston soils, 6 to 10 percent slopes	484	.2
Faceville and Ruston soils, 6 to 10 percent slopes, eroded	1,288	.5
Faceville and Ruston soils, 10 to 15 percent slopes, eroded	410	.2
Goldsboro loamy sand	2,933	1.2
Grady loam	1,301	.5
Grady sandy loam	1,158	.5
Greenville sandy loam, 0 to 2 percent slopes	427	.2
Greenville sandy loam, 2 to 6 percent slopes	752	.3
Greenville sandy loam, 2 to 6 percent slopes, eroded	819	.3
Greenville sandy loam, 6 to 10 percent slopes, eroded	310	.1
Izagora sandy loam, gray variant	823	.3
Kalmia loamy sand, thick surface	468	.2
Killian loamy sand, 2 to 6 percent slopes	910	.4
Killian loamy sand, 6 to 10 percent slopes	341	.1
Killian loamy sand, 6 to 10 percent slopes, eroded	171	.1
Killian loamy sand, 10 to 15 percent slopes	120	.1
Killian loamy sand, thick surface, 2 to 6 percent slopes	1,117	.5
Killian loamy sand, thick surface, 6 to 10 percent slopes	732	.3
Lakeland loamy sand	268	.1
Lakeland sand, 0 to 6 percent slopes	26,373	10.9
Lakeland sand, 6 to 10 percent slopes	10,127	4.2
Lakeland sand, 10 to 15 percent slopes	2,176	.9
Lakeland sand, shallow, 0 to 2 percent slopes	1,700	.7
Lakeland sand, shallow, 2 to 6 percent slopes	13,852	5.7
Lakeland sand, shallow, 6 to 10 percent slopes	2,664	1.1
Lakeland sand, shallow, 10 to 15 percent slopes	432	.2
Local alluvial land	3,431	1.4
Lynchburg sandy loam	5,281	2.2
Magnolia sandy clay loam, 2 to 6 percent slopes, severely eroded	201	.1
Magnolia sandy clay loam, 6 to 10 percent slopes, severely eroded	787	.3
Magnolia sandy clay loam, 10 to 15 percent slopes, severely eroded	163	.1
Magnolia sandy loam, 0 to 2 percent slopes	1,013	.4
Magnolia sandy loam, 2 to 6 percent slopes	4,588	1.9

TABLE 8.--Approximate acreage and proportionate extent of soils--Continued

Soil	Area	Extent
	Acres	Percent
Magnolia sandy loam, 2 to 6 percent slopes, eroded	2,889	1.2
Magnolia sandy loam, 6 to 10 percent slopes	247	.1
Magnolia sandy loam, 6 to 10 percent slopes, eroded	1,855	.8
Magnolia sandy loam, 10 to 15 percent slopes, eroded	318	.1
Marlboro fine sandy loam, 0 to 2 percent slopes	513	.2
Marlboro fine sandy loam, 2 to 6 percent slopes	349	.1
Mixed alluvial land	7,265	3.0
Myatt loamy sand	1,077	.4
Norfolk loamy sand, 0 to 2 percent slopes	10,281	4.3
Norfolk loamy sand, 2 to 6 percent slopes	6,509	2.7
Norfolk loamy sand, 2 to 6 percent slopes, eroded	427	.2
Norfolk loamy sand, 6 to 10 percent slopes	184	.1
Norfolk loamy sand, thick surface, 0 to 2 percent slopes	2,324	1.0
Norfolk loamy sand, thick surface, 2 to 6 percent slopes	11,640	4.8
Norfolk loamy sand, thick surface, 6 to 10 percent slopes	817	.3
Norfolk loamy sand, thin solum, 2 to 6 percent slopes	1,326	.6
Norfolk loamy sand, thin solum, 2 to 6 percent slopes, eroded	223	.1
Norfolk loamy sand, thin solum, 6 to 10 percent slopes	200	.1
Okenee loam	361	.2
Orangeburg loamy sand, 0 to 2 percent slopes	1,833	.8
Orangeburg loamy sand, 2 to 6 percent slopes	2,735	1.1
Orangeburg loamy sand, 2 to 6 percent slopes, eroded	723	.3
Orangeburg loamy sand, 6 to 10 percent slopes	414	.2
Orangeburg loamy sand, 6 to 10 percent slopes, eroded	711	.3
Orangeburg loamy sand, 10 to 15 percent slopes, eroded	450	.2
Plummer-Rutlege loamy fine sands	292	.1
Portsmouth loam	852	.4
Rains sandy loam	755	.3
Ruston loamy sand, thick surface, 0 to 2 percent slopes	981	.4
Ruston loamy sand, thick surface, 2 to 6 percent slopes	5,694	2.4
Ruston loamy sand, thick surface, 6 to 10 percent slopes	2,381	1.0
Ruston loamy sand, thick surface, 10 to 15 percent slopes	722	.3
Sandy and clayey land, sloping	5,485	2.3
Sandy and clayey land, moderately steep	11,776	4.9
Swamp	9,773	4.1
Tifton sandy loam, 2 to 6 percent slopes	293	.1
Vaucluse loamy sand, 2 to 6 percent slopes	486	.2
Vaucluse loamy sand, 2 to 6 percent slopes, eroded	289	.1
Vaucluse loamy sand, 6 to 10 percent slopes	1,243	.5
Vaucluse loamy sand, 6 to 10 percent slopes, eroded	1,658	.7
Vaucluse loamy sand, 10 to 15 percent slopes	924	.4
Vaucluse loamy sand, 10 to 15 percent slopes, eroded	829	.3
Vaucluse loamy sand, 15 to 20 percent slopes, eroded	977	.4
Vaucluse loamy sand, thick surface, 2 to 6 percent slopes	754	.3
Vaucluse loamy sand, thick surface, 6 to 10 percent slopes	2,623	1.1
Vaucluse loamy sand, thick surface, 10 to 15 percent slopes	1,379	.6
Wehadkee and Chewacla silt loams	2,380	1.0
Total	241,280	100.0

1/ Less than 0.1 percent.

part of it has recently been planted to pine. Crop suitability is limited by a firm, slowly permeable subsoil.

Caroline loamy sand, 2 to 6 percent slopes (CaB).--This is a deep, firm, clayey soil of the Coastal Plain uplands.

Profile description:

0 to 13 inches, dark grayish-brown loamy sand.
13 to 17 inches, red sandy clay loam faintly mottled with yellowish red and strong brown; fine, subangular blocky structure.
17 to 28 inches, red and reddish-yellow, firm clay; fine, subangular blocky structure.
28 to 38 inches, yellowish-red, firm sandy clay mottled with red and yellow; fine, subangular blocky structure.

The surface layer ranges from dark grayish brown to grayish brown; its color depends on the amount of organic matter. The subsoil ranges from red to yellowish red or yellowish brown and, in some places, is faintly mottled in the upper part. In the lower part of the subsoil, the mottles are more numerous and more distinct. The depth to the mottles ranges from 15 to 24 inches. The subsoil ranges from clay to sandy clay and is coarser textured next to the Ruston soils.

Included with this soil are a few areas of Ruston, Faceville, and Vaucluse soils that are too small to be mapped separately.

Although the root zone is thick, the subsoil is slowly permeable and retards the development of roots and the movement of water. The soil can supply a medium amount of water to plants. The organic-matter content of this soil is medium to low, and natural fertility is medium. The erosion hazard is moderate. This soil responds fairly well to good management, including fertilization. It is generally in fair tilth but can be worked within only a narrow range of moisture content.

The total acreage of this soil is small, but some of it occurs in large areas. A few small areas are scattered throughout the county and are mostly on small slope breaks and knolls. The principal crops are small grains, soybeans, cotton, corn, and pasture grasses. Much of the cleared acreage is reverting to pine. Moderate practices of erosion control are needed for good crop yields. (Capability unit IIe-3; woodland suitability group 3)

Caroline loamy sand, 2 to 6 percent slopes, eroded (CaB2).--The surface layer of this soil ranges from 3 to 9 inches in thickness and is thinner and more variable in thickness than that of Caroline loamy sand, 2 to 6 percent slopes. Small areas of the reddish subsoil material are exposed along slope breaks. Included in draws are areas of Local alluvial land that are too small to be mapped separately.

The organic-matter content and natural fertility of this soil are generally low. Some areas are so uneven that terracing and tilling on the contour are difficult. In these areas the erosion hazard is severe and intensive erosion control is needed. (Capability unit IIe-3; woodland suitability group 3)

Caroline loamy sand, 6 to 10 percent slopes (CaC).--This sloping soil has more rapid surface runoff than Caroline loamy sand, 2 to 6 percent slopes, and is more susceptible to erosion. Less of its acreage is cultivated.

Much of this soil is in pasture, but the largest acreage is in native woods, has reseeded naturally to trees, or has been planted to pine. Terracing and tilling on the contour help to maintain fertility and to decrease the loss of soil. If the soil is cultivated to row crops, the cropping system should provide cover crops or close-growing crops two-thirds of the time. To maintain yields this soil requires more fertilizer than Caroline loamy sand, 2 to 6 percent slopes. It has many sites suitable for farm ponds. (Capability unit IIIe-3; woodland suitability group 3)

Caroline loamy sand, 6 to 10 percent slopes, eroded (CaC2).--This sloping soil has a thinner surface layer of less uniform thickness than has Caroline loamy sand, 2 to 6 percent slopes. Runoff is more rapid, and the erosion hazard is greater. Also, fertility and the organic-matter content are lower.

Most of this soil is in pasture or in woods. It is well suited to perennial plants, especially to trees. Much of the acreage has reseeded to pines or has been recently planted to them. Sites suitable for constructing ponds are numerous. (Capability unit IIIe-3; woodland suitability group 3)

Caroline loamy sand, 10 to 15 percent slopes (CaD).--This strongly sloping soil is on short slopes. Its subsoil, in places, is several inches thinner than that of Caroline loamy sand, 2 to 6 percent slopes. Runoff is rapid and causes severe erosion if the soil is cultivated. The fertility and the content of organic matter are medium. Mainly because ample moisture is available for deep-rooted plants, pine and hardwood trees grow well.

This soil is in small areas and has a small total acreage. It is not suited to row crops, and practically all the acreage is wooded. Good sites for ponds are common along the streams flowing through areas of this soil. (Capability unit IVe-3; woodland suitability group 3)

Caroline loamy sand, 10 to 15 percent slopes, eroded (CaD2).--The surface layer of this soil is thinner and of less uniform thickness than that of Caroline loamy sand, 2 to 6 percent slopes. It ranges from 3 to 9 inches in thickness. Included with this soil are small areas where the reddish subsoil is exposed, and also areas of Vaucluse soils that are too small to be mapped separately. Runoff is rapid because of the strong slopes, but enough water is available for good tree growth. The erosion hazard is severe in cultivated fields.

This soil occurs in small, narrow areas and has a small total acreage. Practically all of it is in pine that has reseeded naturally. (Capability unit IVe-3; woodland suitability group 3)

Caroline loamy sand, 15 to 25 percent slopes, eroded (CaE2).--The surface layer of this steep soil ranges from 4 to 13 inches in thickness, and the subsoil ranges from 12 to 20 inches. Runoff

is very rapid, but enough moisture is available for good tree growth. Natural fertility and the organic-matter content are medium.

This soil is in small, narrow areas along streams. The total acreage is small. The soil is not suited to crops or pasture, and most of it is wooded. Small, formerly cleared areas have reverted to trees. (Capability unit VIIe-2; woodland suitability group 3)

Caroline loamy sand, thick surface, 2 to 6 percent slopes (CbB).--This soil, in most profile characteristics, is similar to Caroline loamy sand, 2 to 6 percent slopes, but it has a much thicker surface layer. The surface layer ranges from 18 to 30 inches in thickness.

The roots of most crops on this soil are almost entirely in the loamy sand surface layer, which is low in available moisture capacity. In some years annual and shallow-rooted plants may be damaged because moisture is lacking during short dry spells and early in spring before the roots have developed. The organic-matter content is low, and natural fertility is low to medium.

The main crops are small grains, soybeans, cotton, corn, and sericea lespedeza. In much of the acreage, however, pine has reseeded or has been planted. Because the soil is gently sloping, erosion is a slight to moderate hazard. (Capability unit IIe-4; woodland suitability group 4)

Caroline loamy sand, thick surface, 6 to 10 percent slopes (CbC).--This soil and Caroline loamy sand, 2 to 6 percent slopes, are similar, but the more sloping soil has a thicker surface layer, which is 18 to 30 inches thick. Runoff is more rapid than on the gently sloping soil, and the erosion hazard is greater in cultivated fields. Consequently, this soil is less suitable for crops. Its acreage is small, and most of it is in permanent vegetation, mainly trees. (Capability unit IIIe-4; woodland suitability group 4)

Caroline sandy clay loam, 6 to 10 percent slopes, severely eroded (CcC3).--This soil used to have a loamy sand surface layer, but large areas have been severely eroded, and the reddish, clayey subsoil is exposed. In some places 6 or 7 inches of subsoil material has been removed. Small gullies are common. Included with this soil are areas where the loamy sand of the original surface layer is less than 3 inches thick and a few small spots where it is thicker.

The infiltration rate is low on this sloping soil because the slowly permeable subsoil is exposed or is near the surface. Consequently, surface runoff is high and erosion is severe if the soil is bare. Because clayey material is at or near the surface, roots develop poorly. Natural fertility and the organic-matter content are low.

This soil is in small, narrow bands on short slopes along drainageways and on knolls. It is not suited to crops and is only fairly well suited to pasture and hay. Although most of this soil has been cleared and cultivated, it has been abandoned and has reverted to trees. (Capability unit VIe-2; woodland suitability group 13)

Chewacla Series

In the Chewacla series are brown to dark-brown, somewhat poorly drained soils that have developed in fine-textured sediments deposited by streams on the first bottoms of the Congaree River. These sediments washed from soils of the Piedmont Plateau and the Blue Ridge Mountains. The Chewacla soils range from silt loam to silty clay loam and, in a few places, contain strata of fine sand. In some places the profile is uniform in texture, but in other places there are layers of different texture. Slopes range from 0 to 2 percent.

The Chewacla soils adjoin the Congaree and Wehadkee soils and resemble them in color and texture, but they are less well drained than the Congaree soils and are mottled with gray at a depth of 18 to 24 inches. The poorly drained Wehadkee soils are mottled with gray within 6 to 12 inches of the surface. In many places Chewacla soils grade toward and adjoin the Myatt and Okenee soils but are not so strongly developed as those soils, which have distinct color and textural differences between the surface layer and the subsoil.

The Chewacla soils in this county occur only on the first bottoms of the Congaree River. Although the root zone is only moderately thick, these soils can supply large amounts of water to plants because they have a high water table. They are medium acid and are medium in natural fertility and organic-matter content. The native vegetation was hardwoods, mainly blackgum, sweetgum, poplar, ash, oak, and a few loblolly pines.

Chewacla silt loam (Ch).--This is a somewhat poorly drained soil in alluvium on the flood plain of the Congaree River.

Profile description:

0 to 7 inches, dark-brown, slightly sticky silt loam with fine, subangular blocky structure.
7 to 19 inches, dark-brown, slightly plastic silty clay loam with fine, subangular blocky structure.
19 to 30 inches, mottled, dark yellowish-brown and light yellowish-brown, slightly sticky silty clay loam with fine, subangular blocky structure.
30 to 60 inches, brown, sticky silty clay.

The depth to mottling ranges from 18 to 24 inches. This depth decreases where this soil grades toward the poorly drained Wehadkee soils and increases where it grades toward the well-drained Congaree soils. In some places, a few, faint, brownish-gray mottles occur above a depth of 18 inches. In a few places the silt loam extends from the surface through the entire profile. Also in a few areas, recent sediments, 16 to 24 inches thick, overlie gray or light-gray, poorly drained, sandy clay material of old stream terraces.

This soil has slow runoff, high available moisture capacity, and a high water table. Drainage is required to regulate the seasonal fluctuations of this water table so that the soil is workable and plants do not drown during rainy periods in the

growing season. This soil generally cannot be worked early in spring or soon after a rain.

Chewacla silt loam is medium acid and high in natural fertility and in organic-matter content. It responds well to fertilization. Occasional flooding is a hazard during the growing season.

If adequately drained, this soil is suited to corn and small grains and is well suited to pasture and hay crops. It is also well suited to trees, both hardwoods and pines. Practically all of the acreage is in trees, and only a small part is in pasture or hay crops. An increased use of this soil for crops, pasture, and timber seems feasible if soil management is good. (Capability unit IIIw-3; woodland suitability group 8)

Congaree Series

In the Congaree series are brown to dark-brown, well-drained, nearly level soils that have developed in fine-textured sediments deposited on the flood plain along the Congaree River. The sediments washed from the soils of the Piedmont Plateau and Blue Ridge Mountains. Color and texture are generally uniform throughout the profile, but in some places there are brown or dark yellowish-brown layers of silty clay loam, silt loam, fine sandy loam, or sand. Slopes range from 0 to 2 percent.

The Congaree soils adjoin and are above the somewhat poorly drained Chewacla soils and the poorly drained Wehadkee soils, and they resemble those soils in color and texture. Unlike the Chewacla and Wehadkee soils, which are mottled fairly near the surface, the Congaree soils are free of mottling to a depth of 36 inches in most places. In a few places they are mottled with gray 33 inches from the surface.

These soils have a thick or very thick root zone, which is moderately rapid in permeability. They are high in available moisture capacity, are generally in good tilth, and respond well to fertilization. They are high in natural fertility and are medium acid. Large areas are along the Congaree River. The native vegetation was mixed hardwoods, consisting of sweetgum, blackgum, poplar, oak, and a few loblolly pines.

Congaree silt loam (Cn).--This is a deep, fertile soil on the flood plain of the Congaree River.

Profile description:

0 to 11 inches, dark-brown, friable silt loam with fine, crumb structure.
11 to 17 inches, dark-brown, friable very fine sandy loam with weak, subangular blocky structure.
17 to 45 inches, dark yellowish-brown, loose fine sand.

In many places the texture to a depth of 3 feet is uniformly silt loam, but included with this soil are a few areas of fine sandy loam that are too small to be mapped separately. The depth to gray mottling generally ranges from 36 to 48 inches. Mottling occurs at 33 inches, however, in areas of this soil that grade toward the Chewacla soils. Small areas of Chewacla and Wehadkee soils that are too small to be mapped separately are included in some places.

Congaree silt loam has slow runoff; slow to moderate infiltration; a thick, permeable root zone; and high available moisture capacity. Consequently, this soil can supply large amounts of moisture to plants. It is well suited to corn, pasture, hay, and truck crops. This soil is high in natural fertility, is medium acid, and responds well to fertilization and other good management. It is generally in good tilth and can be worked sooner after rains than any other soil in the county on first bottoms.

The native vegetation was hardwoods, mainly gum, poplar, ash, oak, and some loblolly pine. Much of the acreage, though cutover, is well suited to these trees and is still covered by them. Much of the cleared acreage is planted to corn, pasture, and hay crops. Flooding is a slight hazard on this soil, but damaging floods are not frequent during the growing season. (Capability unit IIw-4; woodland suitability group 5)

Congaree-Chewacla silt loams (Co).--These level or nearly level soils are mapped together on the flood plain of the Congaree River. They occur in an intricate pattern in heavily wooded and isolated parts of the plain. They differ mainly in drainage; the Congaree soil is well drained, and the Chewacla soil is somewhat poorly drained. These two soils are in about equal parts of a few large areas. They have a small total acreage, and all of it is wooded. Included with them are areas of Swamp and of Wehadkee soils that are too small to be shown on the map. (Capability unit IVw-1; woodland suitability group 8)

Coxville Series

Soils of the Coxville series are deep and poorly drained. These soils generally have a very dark gray, sandy loam surface layer and a mottled, gray or grayish-brown, sandy clay subsoil. They have developed in beds of sandy clay in depressions in the lower uplands on the Coastal Plain. The depressions are large, irregularly shaped flats or small, rounded or oval sinks. They are locally called bottoms.

These soils have a slowly permeable subsoil, are strongly acid or very strongly acid, and are medium in fertility and organic-matter content. Slopes range from 0 to 2 percent.

The Coxville soils lie close to and, in some places, adjoin the Portsmouth, Rains, Lynchburg, Dunbar, and Goldsboro soils. They resemble those soils in some ways. The Coxville soils, however, lack the thick, black surface layer of Portsmouth soils and are finer textured in the subsoil and better drained. Also, they have a finer textured subsoil than Rains, Lynchburg, and Goldsboro soils, and a darker gray surface layer than Dunbar and Goldsboro soils.

The dark-gray surface layer of Coxville soils contrasts markedly with the lighter colored surface layer of Norfolk and Marlboro soils. In many places Coxville soils adjoin and are below the Norfolk and Marlboro soils. In areas along the

northern boundary of the county, the Coxville soils lie close to Grady soils. They have more prominent, red mottling in the subsoil than the Grady soils, and they are less sticky, are more friable, and contain less kaolin than those soils.

The Coxville soils are extensive in this county and occur in many small areas in the southeastern part. They are moderately productive and are important agriculturally. Their native vegetation was gum, oak, hickory, poplar, loblolly pine, and longleaf pine. A large part of the acreage has been cleared and is planted to cotton, corn, small grains, soybeans, truck crops, and some pasture. Some areas are still wooded, and some formerly cleared areas have grown up in loblolly pine.

Coxville sandy loam (Cx).--This is a poorly drained soil of the Coastal Plain.

Profile description:

0 to 6 inches, dark-gray, friable sandy loam.
6 to 18 inches, gray, friable sandy clay loam mottled with yellowish brown.
18 to 37 inches, grayish-brown, friable sandy clay loam mottled with yellowish brown and red.

In fields that have been cultivated for some time, the surface soil is lighter gray than that described because cultivation has caused a decrease in organic matter. Mottling varies in amount and in the depth at which it occurs. It is faint or missing in the 6- to 18-inch layer. The subsoil ranges from sandy clay loam to sandy clay.

Included with this soil are a few areas of Lynchburg, Rains, and Portsmouth soils that are too small to be shown on the map.

This soil has slow permeability, slow infiltration, and slow runoff. Unless the water table has been lowered by drainage structures, it is close to the surface in wet periods. The soil has a medium available moisture capacity. If it is adequately drained, it supplies ample moisture for good plant growth, is well suited to mechanized farming, and is generally in good tilth. It contains a medium amount of organic matter, is medium in fertility, and is medium acid to strongly acid. It can be worked under about the same moisture conditions as the well-drained, nearly level soils surrounding it. This is fortunate because areas of this soil are so small that it is not practical to work them separately.

Although the suitability for crops varies, practically all local crops are grown on this soil. The principal ones are cotton, corn, small grains, soybeans, pasture, hay, and some truck crops. Farming can be intensive if excess water is controlled by drainage. Open ditches or open ditches and tile are generally used for drainage. Many areas of this soil are suitable for digging ponds. (Capability unit IIIw-2; woodland suitability group 9)

Dunbar Series

Soils of the Dunbar series are nearly level, fine textured, and somewhat poorly drained or moderately well drained. They are somewhat poorly drained in most places. These soils have developed in beds of sandy clay and clay loam on the middle uplands of the Coastal Plain. Dunbar soils are productive, high in fertility, and moderate in available moisture capacity. They respond well to fertilization and are strongly acid. Slopes range from 0 to 2 percent.

The Dunbar soils adjoin and, in some ways, resemble the Marlboro, Magnolia, Faceville, Coxville, Grady, Goldsboro, Lynchburg, and Rains soils. They are similar to the well-drained Marlboro, Magnolia, and Faceville soils in texture but are mottled in the subsoil and are not so well drained as those soils. In many places Dunbar soils adjoin the poorly drained Coxville and Grady soils. They are better drained and have a lighter colored surface soil than have the Coxville and Grady soils, but their subsoil is not so gray as that of those soils and is more uniformly yellow in the upper part. Although the Dunbar soils adjoin the Goldsboro and Lynchburg soils in only a few places, they closely resemble them in color. The Dunbar soils, however, have a finer textured subsoil. They are better drained than the Rains soils and have a finer textured, lighter colored surface layer.

The Dunbar soils are not extensive in the county and are mostly between Cameron and St. Matthews in the middle part. The native vegetation was mixed stands of hardwoods and pines. Nearly all of the acreage now is in cultivation, but some is in pasture. A thick root zone, high natural fertility, and good available moisture capacity make these soils desirable for crops, especially for corn and other crops that need ample moisture.

Dunbar sandy loam (Du).--This is a nearly level, deep, somewhat poorly drained soil.

Profile description:

0 to 7 inches, dark-gray, friable sandy loam.
7 to 14 inches, yellowish-brown, friable sandy clay loam with a few, fine, strong-brown mottles.
14 to 21 inches, yellowish-brown fine sandy clay loam mottled with grayish brown and red.
21 to 30 inches, grayish-brown sandy clay loam mottled with yellowish brown and yellowish red; slightly firm.
30 to 50 inches, mottled, grayish-brown, yellowish-brown, and yellowish-red, firm sandy clay loam.

The surface layer ranges from sandy loam to fine sandy loam in texture and from dark gray to dark grayish brown in color. The subsoil is clay loam instead of sandy clay loam in some places. In moderately well drained areas, the mottling is not prominent above a depth of 24 to 30 inches. Included with this soil in areas too small to be mapped separately are the well-drained Marlboro soils and the poorly drained Coxville soils.

Dunbar sandy loam has slow to medium runoff, moderately slow infiltration, and medium available moisture capacity. The water table frequently rises to within 24 to 36 inches of the surface during wet periods. By draining excess water, many areas

can be made more suitable for plants. Through drainage, tilth is improved, the effective root zone is deepened, and the soil is made easier to work. In many places this soil can be sufficiently drained by draining small areas of an adjacent, poorly drained soil.

This soil has a small total acreage in this county. It is suited to most crops grown in the county and is very well suited to corn, pasture grasses, and other crops that require much moisture. It responds well to fertilization and other good management. (Capability unit IIw-2; woodland suitability group 7)

Eustis Series

Soils of the Eustis series are deep to very deep and excessively drained. They are brown sand or loamy sand to a depth of 3 feet or more. They have developed on the upper and middle Coastal Plain in beds of sand and loamy sand. These soils are droughty, low in fertility, strongly acid or very strongly acid, and have a low supply of plant nutrients.

The Eustis soils adjoin the Lakeland, Ruston, Vaucluse, and Norfolk soils and in some ways are similar to them. They resemble the Lakeland soils in texture but are browner. Eustis soils resemble the Ruston and Vaucluse soils in color, but they are much coarser textured in the subsoil than the Ruston soils, and they lack the firm, hard or weakly cemented subsoil of the Vaucluse soils. Eustis soils are browner and much coarser textured than the Norfolk soils.

In this county the Eustis soils are most extensive in the northern half, but some of them occur throughout the central part. The native vegetation was longleaf pine with an understory of blackjack oak and a few other hardwoods. The Eustis soils are not farmed intensively. Much of the acreage has been abandoned and allowed to grow up naturally to broomstraw and undesirable hardwoods or pines. Many acres have been planted to slash pine and loblolly pine. Because of low available moisture capacity and low fertility, these soils are not suited to many kinds of crops.

Eustis loamy sand, 0 to 6 percent slopes (EmB).--This is a deep, excessively drained soil.

Profile description:

0 to 6 inches, brown, loose loamy sand.
6 to 33 inches, yellowish-red, very friable loamy sand.
33 to 45 inches, yellowish-red, loose loamy sand.

The characteristics of this soil do not vary much below the surface layer. In most places the loamy sand extends to a depth of 36 to 60 inches, but in a few small areas there is yellowish-red or red sandy loam or sandy clay loam within 30 to 36 inches of the surface. The color of the surface layer ranges from dark brown to brown and depends on the content of organic matter and on texture. As this soil grades toward the Lakeland and Norfolk soils, the loamy sand subsoil ranges from yellowish red to reddish yellow or yellowish brown.

Included with this soil in areas too small to be mapped separately is Eustis sand, 0 to 6 percent slopes, which is also next to this soil in many places. Also included are small areas of Ruston and Vaucluse soils.

The permeability of this Eustis soil is very rapid; 10 inches or more of water percolates through it per hour. Surface runoff is slow, and infiltration is rapid. This soil does not contain enough moisture for most local plants. Also, it is low in plant nutrients, and it readily loses organic matter and applied fertilizer through leaching. However, this soil responds to additions of fertilizer better than does Eustis sand, 0 to 6 percent slopes, because it is finer textured than that soil.

Because its available moisture capacity is low, this soil dries out fast and can be worked soon after rains. It is not well suited to many crops and is not suited to crops that require a large amount of moisture in summer. Soil blowing is sometimes serious in areas that are large or exposed, dry, and freshly plowed.

This soil makes up more than 2 percent of the county and is in large and small areas. Most of it is in stands of trees or is reverting naturally to trees. Many acres have been reforested and planted to slash pine. Much of this soil is also in pasture. It is suited to bahiagrass, Coastal bermudagrass, sericea lespedeza, and other perennials. Crops grown are cotton, corn, small grains, and soybeans. Fertilizer, especially nitrogen, is needed in small, frequent applications. This soil responds to additions of organic matter, which can be added by growing and plowing under cover crops between the harvest of one crop and the planting of another. (Capability unit IIIs-1; woodland suitability group 2)

Eustis loamy sand, 6 to 10 percent slopes (EmC).--This soil is similar to Eustis loamy sand, 0 to 6 percent slopes, in most characteristics. Because slopes are stronger, however, there is slightly more runoff and erosion on this soil, especially when rains are heavy. This soil is more droughty than the less sloping soil and is more leached of plant nutrients and organic matter. The best use of this soil is for deep-rooted perennials. (Capability unit IVs-1; woodland suitability group 2)

Eustis loamy sand, 10 to 15 percent slopes (EmD).--This soil is more strongly sloping than Eustis loamy sand, 0 to 6 percent slopes, but it is similar to that soil in most other characteristics. In many places the thickness of the loamy sand is less. In many places the loamy sand is 36 to 48 inches thick, and in a few places it is 30 to 36 inches thick.

Erosion, leaching, and droughtiness limit the use of this soil, but on some slopes trees can be grown because enough moisture is available. This soil is not suited to row crops, but sericea lespedeza, trees, and other deep-rooted perennials can be grown. (Capability unit VIs-1; woodland suitability group 2)

Eustis sand, 0 to 6 percent slopes (EsB).--This soil differs considerably from Eustis loamy sand, 0 to 6 percent slopes. The texture of its entire profile is sand rather than loamy sand. The sand extends from the surface to a depth of 3 to 9 feet

or more, but the loamy sand of the Eustis loamy sand does not extend so deep. Although the surface layers of the two soils are similar in color, the sandy material in the subsoil of this soil is brown and strong brown in many places, whereas that of the loamy sand is more uniformly yellowish red.

This soil is lower in fertility, organic matter, and available moisture capacity than Eustis loamy sand, 0 to 6 percent slopes. Leaching is more severe, and the plant nutrients in applied fertilizer are retained in smaller amounts. Soil blowing is also more severe. That less moisture is available in this soil is shown by the kinds of trees that grow on it and their quality. Blackjack oak is the dominant tree in uncleared areas and where pine has been cut over.

This soil occurs mostly in large areas in the northern part of the county. Most of the soil is in woods. Some pure stands of pine, mostly longleaf, have seeded naturally, and many areas have been planted to slash pine. Yields of cultivated crops are low. They are lower than those on the loamy sand, even where each soil has been fertilized at about the same rate. The two soils are suited to about the same kinds of pasture plants and crops. (Capability unit IVs-1; woodland suitability group 1)

Eustis sand, 6 to 10 percent slopes (EsC).--Although this soil is somewhat similar to Eustis loamy sand, 0 to 6 percent slopes, it differs from that soil in about the same ways as does Eustis sand, 0 to 6 percent slopes. It is more droughty than the loamy sand, is less easily worked, and because of the stronger slopes, is more susceptible to erosion if cultivated. (Capability unit IVs-1; woodland suitability group 1)

Eustis sand, 10 to 15 percent slopes (EsD).--In some respects this soil is similar to Eustis loamy sand, 0 to 6 percent slopes, but it differs from that soil in about the same ways as does Eustis sand, 0 to 6 percent slopes. This strongly sloping soil is less suitable for crops than the loamy sand because erosion and droughtiness are greater hazards. In some areas underground moisture is available to trees. Practically all of the acreage is wooded. (Capability unit VIIs-1; woodland suitability group 1)

Faceville Series

In the Faceville series are deep, well-drained soils. In most places they have a dark grayish-brown, loamy fine sand surface layer and a yellowish-red, fine-textured subsoil that is generally sandy clay or fine sandy clay. These soils have developed in beds of sandy clay and clay on the higher parts of the middle Coastal Plain. They are highly fertile and very productive. Slopes range from 0 to 15 percent.

The Faceville soils commonly adjoin the Marlboro, Magnolia, Ruston, and Caroline soils and in some ways resemble them. Faceville soils resemble the Marlboro and Magnolia soils in texture and consistence, but they have a yellowish-red subsoil in contrast to the yellowish-brown and red subsoil of the Marlboro and Magnolia soils. Faceville soils occur slightly above the Marlboro soils and slightly below the Magnolia soils. Although their color is similar to that of the Ruston soils, Faceville soils are much finer textured in the subsoil. They are similar to the Caroline soils in color, but they are slightly coarser textured, are more friable in the subsoil, and lack the noticeable, blocky structure. In many places the Faceville and the Caroline soils are underlain by the same kinds of clay beds, but Faceville soils are slightly above the Caroline soils.

The Faceville soils occur in large and small areas in a fairly wide tract that extends through the middle part of the county. The native vegetation was mixed stands of pines and hardwoods, but practically all of the acreage is now cultivated. These soils produce high yields of all the locally grown crops, mainly cotton, corn, small grains, and soybeans, as well as some pasture, hay, and pecans. Peach trees that have recently been planted in a few orchards are yielding well.

Faceville loamy fine sand, 2 to 6 percent slopes (FaB).--This is a deep, well-drained, friable soil of the upper Coastal Plain.

Profile description:

0 to 13 inches, dark grayish-brown and pale-brown, loose loamy fine sand.
13 to 30 inches, yellowish-red, friable sandy clay; slightly sticky when wet.
30 to 50 inches, yellowish-red sandy clay mottled with strong brown and red.

The surface layer ranges from loamy sand to loamy fine sand, and the subsoil ranges from sandy clay to fine sandy clay. In some places where this soil grades toward the Caroline soils, the subsoil is somewhat thinner than normal. The subsoil is redder in areas grading toward the Magnolia soils. Included with this soil are small areas of Ruston, Magnolia, and Caroline soils that are too small to be mapped separately. Also included are a few small, eroded areas.

This soil has a deep, fine-textured root zone that absorbs sufficient nutrients and supplies them to plants. It responds well to fertilization. Permeability and infiltration are moderately slow, runoff is slow, and the moisture available to plants is high. The organic-matter content is medium, and the soil is medium acid or strongly acid.

The surface layer of this soil is easily tilled and can be worked within a fairly wide range of moisture content, though not in so wide a range as can some of the coarser textured, more permeable soils. Because slopes are smooth and regular, parallel terracing and contour cultivation are fairly easy. This soil is generally well suited to parallel terracing. Although the soil occurs in large areas, its total acreage is small. The erosion hazard is slight and can be greatly lessened by using suitable contour cultivation. Organic matter can be built up by heavy fertilization and by use of crop residue. (Capability unit IIe-2; woodland suitability group 3)

Faceville loamy fine sand, 0 to 2 percent slopes (FaA).--In most profile characteristics this soil is similar to Faceville loamy fine sand, 2 to 6 percent

slopes. Because it is more nearly level, however, erosion is not a hazard and cultivation can be more intensive. Fertility can be maintained through high fertilization, and organic matter can be built up by the use of crop residue. The acreage of this soil is small. (Capability unit I-2; woodland suitability group 3)

Faceville loamy fine sand, 2 to 6 percent slopes, eroded (FaB2).--Because it is eroded, this soil has a thinner surface layer of less uniform thickness than has Faceville loamy fine sand, 2 to 6 percent slopes. The surface layer ordinarily ranges from 3 to 9 inches in thickness, but in a few small areas it is thicker than 9 inches. In small areas the yellowish-red subsoil is exposed.

This eroded soil has a slightly lower infiltration rate than the noneroded soil and contains less organic matter in the surface layer. Consequently, runoff is greater and the erosion hazard is moderate. In addition to contour tillage, an increase in organic matter is needed. The organic matter can be supplied by growing and plowing under cover crops and by adding crop residue to the soil. (Capability unit IIe-2; woodland suitability group 3)

Faceville loamy fine sand, 6 to 10 percent slopes, eroded (FaC2).--The surface layer of this soil is thinner and of less uniform thickness than that of Faceville loamy fine sand, 2 to 6 percent slopes. It generally ranges from 3 to 9 inches in thickness, but in places the yellowish-red subsoil is exposed. Because this soil is more strongly sloping, runoff is greater than on the gently sloping soil and infiltration is less. The erosion hazard is also greater, and careful tilling on the contour and disposal of water are required. Rilling is noticeable in some places where good contour cultivation has not been practiced. To maintain fertility and organic-matter content, cropping systems should include close-growing crops more frequently than row crops. (Capability unit IIIe-2; woodland suitability group 3)

Faceville and Ruston soils, 2 to 6 percent slopes (FrB).--These soils are mapped together as one unit. A profile description of a Faceville soil follows the description of the Faceville series, and a profile description of a Ruston soil follows the description of the Ruston series. Approximately 70 percent of this mapping unit is Faceville loamy fine sand, and 30 percent is Ruston loamy sand. These soils adjoin each other and have similar color and texture in the surface layer. This layer is dark grayish-brown loamy sand in most places. In a few places the Ruston soil has a brown to dark-brown surface layer. The subsoil of the Ruston soil is also similar to that of the Faceville soil, and in most places is heavy sandy clay loam. In a few places it is sandy loam. In some areas both Faceville and Ruston soils are red in the lower part of the subsoil.

Many small areas of these soils are scattered throughout the county on small knolls and breaks. In many of these areas the surface layer ranges from 6 to 10 inches in thickness and contains many small, concretionary pebbles. The subsoil ranges from 12 to 20 inches in thickness and is more slowly permeable than the surface soil. On the knolls and breaks, runoff and erosion are harder to control than they are elsewhere. In other characteristics and qualities, the soils of this mapping unit are similar to Faceville loamy fine sand, 2 to 6 percent slopes, and are suited to the same kinds of crops. These soils occur in large and small areas throughout the county and make up about 3 percent of the total acreage. (Capability unit IIe-2; woodland suitability group 3)

Faceville and Ruston soils, 0 to 2 percent slopes (FrA).--These soils are similar to Faceville loamy fine sand, 2 to 6 percent slopes. They differ from that soil, however, in about the same ways as do Faceville and Ruston soils, 2 to 6 percent slopes. These nearly level soils are not susceptible to erosion. (Capability unit I-2; woodland suitability group 3)

Faceville and Ruston soils, 2 to 6 percent slopes, eroded (FrB2).--These soils are somewhat similar to Faceville loamy fine sand, 2 to 6 percent slopes, but they differ from that soil in about the same ways as do Faceville and Ruston soils, 2 to 6 percent slopes. Because these soils are eroded, their surface layer is thinner than that of the loamy fine sand; it ranges from 3 to 9 inches in thickness. In some included areas the reddish subsoil is exposed. Runoff is more rapid on these soils than on the Faceville loamy fine sand, and the erosion hazard is greater. Many areas of these soils are scattered throughout the county on small knolls and slope breaks, where the permeability of the subsoil is slow and the thin surface layer contains many small, concretionary pebbles. (Capability unit IIe-2; woodland suitability group 3)

Faceville and Ruston soils, 6 to 10 percent slopes (FrC).--These soils are somewhat similar to Faceville loamy fine sand, 2 to 6 percent slopes, but they differ from that soil in about the same ways as do Faceville and Ruston soils, 2 to 6 percent slopes. Because these soils are more strongly sloping than the Faceville loamy fine sand, runoff is more rapid and erosion of cultivated fields is more likely. Row crops should be grown only 1 year in 3, and the soils should be tilled on the contour and provided with waterways. (Capability unit IIIe-2; woodland suitability group 3)

Faceville and Ruston soils, 6 to 10 percent slopes, eroded (FrC2).--These soils are somewhat similar to Faceville loamy fine sand, 2 to 6 percent slopes, but they differ from that soil in about the same ways as do Faceville and Ruston soils, 2 to 6 percent slopes. In addition, these strongly sloping soils are more eroded. Their surface layer ranges from 3 to 9 inches in thickness and is thinner and more variable in thickness than that of the Faceville loamy fine sand. Runoff is more rapid, and the erosion hazard is greater. Small washes with rough slopes occur in many places and make contour tillage difficult. Because these soils are lower in fertility and organic matter than the Faceville loamy fine sand, heavier fertilization is needed to maintain productivity. (Capability unit IIIe-2; woodland suitability group 3)

Faceville and Ruston soils, 10 to 15 percent slopes, eroded (FrD2).--These soils are somewhat similar to Faceville loamy fine sand, 2 to 6 percent

slopes, but they differ from that soil in about the same ways as do Faceville and Ruston soils, 2 to 6 percent slopes. Because these eroded soils are strongly sloping, runoff is rapid and the soils are susceptible to further erosion. The surface layer is thin; it ranges from 3 to 9 inches in thickness. The reddish subsoil, which is 12 to 30 inches thick, is exposed in some places.

These soils are not generally suited to row crops, and to overcome the severe erosion hazard, they should be planted to sericea lespedeza, pasture grasses, or other deep-rooted perennials. The soils are well suited to trees. Much of the acreage is in woods, and a large part is in pasture. (Capability unit IVe-1; woodland suitability group 3)

Goldsboro Series

In the Goldsboro series are deep to moderately deep, moderately well drained, friable soils that have a dark grayish-brown surface layer and a yellowish-brown subsoil. These soils have developed in beds of sandy loam and sandy clay loam material on the lower Coastal Plain. They are moderately permeable, are medium in fertility and organic-matter content, and are strongly acid. Slopes range from 0 to 2 percent.

The Goldsboro soils adjoin the Norfolk, Lynchburg, Marlboro, Dunbar, and Rains soils and in some ways resemble them. The Goldsboro soils have a subsoil similar in texture to that of the Norfolk and Lynchburg soils, but they are less well drained than the Norfolk soils and are better drained than the Lynchburg soils. Consequently, Goldsboro soils are more mottled in the lower subsoil than the Norfolk and are less mottled with gray than the Lynchburg soils. They resemble the Rains soils in texture but lack the very dark gray surface layer and gray subsoil of those soils. Goldsboro soils occur below the Norfolk soils and above the Lynchburg soils. They are coarser textured throughout the subsoil than the Marlboro, Dunbar, and Portsmouth soils.

The Goldsboro soils in this county are in large acreages south of Creston and Cameron. Their native vegetation was mixed stands of pines and hardwoods, but most areas are now cultivated. Especially in drained areas, these soils have a thick root zone and adequate moisture available for plants. These soils are generally in good tilth and are suited to many kinds of crops.

Goldsboro loamy sand (Gb).--This is a level to nearly level, moderately well drained soil.

Profile description:

0 to 14 inches, very dark grayish-brown loamy sand.
14 to 24 inches, yellowish-brown, friable sandy clay loam.
24 to 32 inches, yellowish-brown, friable sandy clay loam with a few strong-brown and red mottles.
32 to 48 inches, gray sandy clay loam with strong-brown mottles.

In a few places the surface layer of this soil is loamy fine sand. The color in the subsoil varies as the soil grades toward the well-drained Norfolk soils and the somewhat poorly drained Lynchburg soils. The depth to mottling ranges from 24 to 34 inches. Included with Goldsboro loamy sand are small areas of the Norfolk and the Lynchburg soils that are too small to be mapped separately. Also included are small areas of Rains and Portsmouth soils.

This nearly level soil has slow runoff and high infiltration. The subsoil is moderately permeable, and ordinarily the soil drains readily. The water table, however, may rise to within 30 inches of the surface during wet seasons, and drainage may be needed. In many places drainage can be improved by draining the adjacent, wetter Lynchburg, Rains, or Portsmouth soils.

This soil contains ample moisture for crops. Although it is generally in good tilth, it cannot be worked so soon after rains as the well-drained adjoining soils. It is well suited to mechanized farming. This soil contains a medium amount of organic matter and is medium in fertility. It responds well to fertilization and can be farmed intensively if it is drained, is well fertilized, and has its organic-matter content maintained by plowing under crop residue. Because this soil is strongly acid, it needs to be limed. Soil tests should determine the amount of lime needed for a specified crop. Practically all the large areas of this soil are cultivated and are suited to all crops commonly grown in the county. (Capability unit IIw-2; woodland suitable group 3)

Grady Series

The soils of the Grady series are poorly drained and, in most places, have a very dark gray surface layer and a gray subsoil that is mottled in the lower part. These soils have developed in beds of sandy clay and clay of the middle Coastal Plain and are confined to rather sharp-rimmed, oval-shaped depressions that are locally called sinks or Carolina bays. Grady soils are medium in fertility, medium to high in organic-matter content, moderate in available moisture capacity, and slow in permeability. Slopes range from 0 to 2 percent.

In a few places Grady soils are close to or are intermingled with the Coxville soils. They differ from the Coxville by having less mottling in the upper part of the subsoil and mottles that are dominantly yellowish red or yellowish brown instead of red. Also, the Grady soils are slightly more sticky in the subsoil than the Coxville and have a higher content of kaolin. In addition, the surface layer is normally thinner and joins the subsoil more abruptly.

In this county Grady soils are in small areas throughout the central part and make up about 1 percent of the total acreage. The native vegetation was poplar, loblolly pine, pond pine, and other water-loving hardwoods. Where water covered the surface for long periods, water-tolerant shrubs and grasses grew. If the Grady soils are drained, they are fairly productive. They have a deep root zone and high to medium organic-matter content and available moisture capacity. These soils can produce most crops that do not require good drainage.

Grady loam (Gm).--This is a poorly drained, nearly level soil in depressions.

Profile description:

0 to 5 inches, very dark grayish-brown, friable loam.
5 to 20 inches, firm, gray clay with some yellowish-brown mottles.
20 to 32 inches, firm, gray clay with a few yellowish-brown and red mottles.
32 to 48 inches, very firm, gray clay with a few yellowish-red and dark-red mottles.

The surface layer ranges from black to dark gray. The color depends on the amount of organic matter. The thickness of the surface layer ranges from 5 to 9 inches. Included with this soil are a few areas that have a surface layer of silty clay loam or silt loam. The subsoil ranges from sandy clay to clay that is free of mottles in some places and has many mottles in others. A few thin lenses of sand occur in a few places. Toward the middle of some depressions, the surface layer is darker colored, deeper, and wetter than it is on the perimeter. Colluvium from surrounding soils covers the perimeter of these depressions in many places.

This soil has been drained in most areas. The depressions in which it occurs, however, have no natural outlets, and in many places, deep ditches have to be dug through the surrounding uplands to lower the water table. In some areas drainage is not economical. In undrained depressions that have water standing for long periods, only water-loving shrubs, canes, and grasses can grow. Loblolly pine, sweetgum, and water oak grow in some abandoned areas where water does not stand for long periods or where old ditches are partly effective.

Much of this soil is cultivated. If well drained, small areas can be worked along with the surrounding well-drained soils, and the use of farm machinery is thereby made easier. Large areas are better suited to pasture than to row crops. Because the available moisture capacity is moderate, crops are seldom damaged by lack of moisture. The soil tends to pack, however, if it is cultivated soon after rains or is grazed when wet. Although this soil is strongly acid, it responds to liming and fertilization. Adequately drained areas are suited to corn, soybeans, small grains, pasture grasses, and a few truck crops.

Pits for watering stock or for irrigation can be dug in this soil in many places where a water-bearing stratum is within a depth of 20 feet and there is a sufficient hydrostatic head. (Capability unit IIIw-2; woodland suitability group 9)

Grady sandy loam (Gr).--Except for the sandy loam surface layer, this soil is similar to Grady loam and is suitable for the same uses. Most areas of the soil need to be drained (fig. 13). (Capability unit IIIw-2; woodland suitability group 9)

Figure 13.--Water standing on Grady sandy loam that has not been drained.

Greenville Series

The soils of the Greenville series have a dark reddish-brown, sandy loam surface layer and a thick, dark-red, friable sandy clay subsoil. They are well drained. These soils have developed in beds of sandy clay and occupy the higher parts of the middle Coastal Plain. They are high in fertility and are medium acid. Slopes range from 0 to 10 percent.

The Greenville soils adjoin the Magnolia, Faceville, Orangeburg, and Ruston soils and in some ways resemble them. They are similar to Magnolia and Faceville soils in texture, but their surface layer is thinner and darker reddish brown than that of the Magnolia soils. They have a red subsoil in contrast to the yellowish-red subsoil of Faceville soils. Greenville soils have a uniformly thinner and browner surface layer than Orangeburg soils and a darker red and finer textured subsoil. They are redder and finer textured in the subsoil than Ruston soils.

In this county the Greenville soils occur in large areas near Fort Motte in the eastern part. The native vegetation was mixed stands of pines and hardwoods. At present, practically all of the acreage is cultivated. Greenville soils are suited to many kinds of crops because they have a thick root zone, moderate to high available moisture capacity, and high fertility.

Greenville sandy loam, 2 to 6 percent slopes (GsB).--This is a deep, well-drained, red soil.

Profile description:

0 to 5 inches, dark reddish-brown sandy loam.
5 to 15 inches, dark-red, friable sandy clay loam; slightly sticky when wet.
15 to 72 inches, dark-red, friable sandy clay; sticky when wet.

The surface layer ranges from dark reddish brown to reddish brown. In areas near the Magnolia soils,

the subsoil is almost red instead of dark red, and in a few places the surface layer is sandy clay loam. Included with this soil are a few small areas of Magnolia soils and, along the drains, small areas of Local alluvial land. These inclusions are too small to be mapped separately.

This soil has a thick subsoil that is moderately permeable and medium in available moisture capacity. Surface runoff is medium, and the erosion hazard is slight to moderate. The soil cannot be worked soon after rains, because infiltration is moderately slow and the thin surface layer is underlain abruptly by the fine-textured subsoil. This soil is medium acid and has high natural fertility. It responds well to fertilization.

Greenville sandy loam, 2 to 6 percent slopes, is well suited to mechanized farming, for it occurs in large areas, is smoothly sloping, and is generally in good tilth. In most places parallel terraces can be built to facilitate use of machines for tilling on the contour to control erosion. Cultivation can be moderately intensive if organic matter is maintained by use of crop residue and a cover crop is provided 1 year out of 3. This soil is suited to all crops grown locally, especially cotton, small grains, and soybeans. (Capability unit IIe-2; woodland suitability group 3)

Greenville sandy loam, 0 to 2 percent slopes (GsA).--This soil is somewhat similar to Greenville sandy loam, 2 to 6 percent slopes, but is more nearly level, has slower runoff, and is less likely to erode. It can be cultivated intensively. The organic-matter content and fertility can be increased by plowing under crop residue and by applying fertilizer. (Capability unit I-2; woodland suitability group 3)

Greenville sandy loam, 2 to 6 percent slopes, eroded (GsB2).--This soil has a surface layer that ranges from 2 to 4 inches in thickness and is thinner and more variable in thickness than that of Greenville sandy loam, 2 to 6 percent slopes. The red, sandy clay subsoil is exposed in a few places and, in other places, has been mixed with the surface soil through tillage. This soil has greater runoff and slower infiltration than the uneroded soil, and it cannot be worked so soon after rains.

Because the hazard of further erosion is moderate, this soil should be cultivated on the contour and seeded to a close-growing cover crop 1 year in 3. The organic-matter content can be increased by high fertilization, which will also increase plant residue and yields. (Capability unit IIe-2; woodland suitability group 3)

Greenville sandy loam, 6 to 10 percent slopes, eroded (GsC2).--The surface layer of this soil ranges from 2 to 4 inches in thickness and is thinner and more variable in thickness than the surface layer of Greenville sandy loam, 2 to 6 percent slopes. In a few places there are small gullies or washes and spots where the red subsoil is exposed. Runoff is greater on this more strongly sloping soil, and infiltration is less.

This soil has a small total acreage and generally is in narrow areas along drainageways. The washes break its smooth slopes. Because the erosion hazard is severe, the soil should be tilled on the contour and used for row crops not more than 1 year out of 3. A suitable cropping system provides 1 year of cotton and 2 years of grain and lespedeza. (Capability unit IIIe-2; woodland suitability group 3)

Izagora Series

In the Izagora series are deep, nearly level, somewhat poorly drained soils. These soils have developed in beds of sandy loam to sandy clay material that has been washed mainly from the Sandhills and deposited as stream terraces. The soils are medium to low in fertility and are strongly acid. Slopes range from 0 to 2 percent.

The Izagora soils adjoin and are similar in texture to the poorly drained Myatt soils, the very poorly drained Okenee soils, and the well-drained Kalmia soils. They are more uniformly yellow in the upper part of the subsoil than are the Myatt soils and are mottled at a greater depth. Mottling is generally 18 to 24 inches from the surface in the Izagora soils, and 10 to 14 inches from the surface in the Myatt soils. Izagora soils lack the thick, black surface layer of the Okenee soils and have a darker gray surface layer than the Kalmia soils. Izagora soils have well-developed horizons and are above the Congaree, Chewacla, and Wehadkee soils, which they adjoin in many places.

The total acreage of Izagora soils in the county is fairly small. Most areas are near the Congaree River in the northern part, but a few small areas lie along the larger creeks and streams elsewhere in the county. The native vegetation was hardwoods, mainly water oak, red oak, white oak, sweetgum, and poplar, as well as scattered loblolly pine. Most of the present acreage is in crops, pasture, or cutover trees. Adequately drained and fertilized fields produce fair yields of a few crops because the soils have a moderate available moisture capacity.

Izagora sandy loam, gray variant (Iz).--This is a nearly level, somewhat poorly drained soil on stream terraces.

Profile description:

0 to 15 inches, very dark gray, friable sandy loam.
15 to 23 inches, grayish-brown, firm sandy clay.
23 to 38 inches, brown, firm sandy clay mottled with red and yellowish red.

The surface layer generally ranges from 10 to 15 inches in thickness, but in a few places it is as much as 18 inches thick. Included with this soil, where the surface layer is thicker than normal, are soils that have a loamy sand texture and a few small areas that are loamy sand throughout the profile. Also included are a few small areas of Kalmia and of Myatt soils. These included soils are too small to be mapped separately. Izagora sandy loam, gray variant, ranges from light brownish gray or grayish brown to pale yellow, and it is mottled at a depth that ranges from 20 to 30 inches. This soil is paler and more gray than is typical of most soils in the Izagora series because it contains more kaolinitic clay.

This soil has a thick root zone and is moderately slow in permeability and infiltration. Runoff is slow, and the available moisture capacity is medium. In wet periods the water table rises within 30 inches of the surface, and excess water is likely to damage crops. The needed drainage can be provided in many places by draining the Myatt, Okenee, and other adjoining, lower lying soils.

This soil is medium in content of organic matter and is medium to low in fertility. It is suited to corn, cotton, small grains, soybeans, some truck crops, and most kinds of pasture and hay. It is not suited to fruit or nut orchards. This soil can be cropped intensively if large amounts of fertilizer and lime are applied and all plant residue is plowed under to increase organic matter. In many places ponds can be dug for irrigation or for watering stock. (Capability unit IIw-2; woodland suitability group 7)

Kalmia Series

Soils of the Kalmia series are deep and well drained. In most places they have a dark grayish-brown, loamy sand surface layer and an olive-brown or yellowish-brown, sandy loam subsoil. These soils have developed in beds of sandy loam material that was washed from the Coastal Plain and deposited as stream terraces. They are low to medium in fertility and are strongly acid to medium acid. Slopes range from 0 to 2 percent.

The Kalmia soils adjoin and in some ways resemble the Izagora, Myatt, and Okenee soils on terraces and the Lakeland, Norfolk, and Killian soils on uplands. They are similar to the Izagora, Myatt, and Okenee soils in texture but are better drained, lack the mottling in the subsoil, and are lighter colored in the surface layer. They are more nearly level than the Lakeland, Norfolk, and Killian soils and are finer textured and more prominently yellow and olive in the subsoil. Their subsoil is similar to that of the Norfolk soils in texture but is more olive and paler. The Kalmia soils have a coarser and more friable subsoil than the Killian soils.

The Kalmia soils in this county have a small total acreage. They are mostly along the Congaree River, in the northern tip of the county, but small, scattered areas occur along the large streams in other parts. The native vegetation consisted of mixed stands of hardwoods, mostly oak and hickory, and pines. The present acreage is in crops, in pasture or hay, and in cutover trees.

Kalmia loamy sand, thick surface (Ka).--This is a well-drained, deep soil of the stream terraces.

Profile description:

0 to 14 inches, olive-brown, loose loamy sand.
14 to 26 inches, olive-brown, very friable sandy loam.
26 to 48 inches, light olive-brown, loose loamy sand.

The thickness of the loamy sand surface layer ranges from 12 to 24 inches, and in a few places the subsoil is yellowish red. Included with this soil, in some places, are areas of Izagora and Lakeland soils that are too small to be mapped separately.

This soil has moderate permeability and infiltration and slow runoff. The available moisture capacity is low, and annual or shallow-rooted crops are frequently damaged because there is not enough moisture. The content of organic matter is low, and natural fertility is low to medium.

This soil is not well suited to corn and other crops that require a large amount of moisture in summer. It is, however, suited to cotton, grain sorghum, small grains, and soybeans, and to pasture and hay of bahiagrass, bermudagrass, sericea lespedeza, or other grasses. Because the soil is low in plant nutrients, heavy fertilization is needed so that plant growth is increased and more organic matter is accumulated. This soil can be worked soon after rains. Its nearly level relief is an advantage in the use of modern farm machinery. (Capability unit IIs-1; woodland suitability group 4)

Killian Series

In the Killian series are moderately well drained and somewhat poorly drained soils that generally have a dark-gray, loamy sand surface layer and a pale-brown or pale-yellow, clay subsoil. These soils have developed in beds of dominantly kaolin clay in the Sandhill area of the Coastal Plain. They have a high content of kaolin, are moderately deep, are strongly acid, and are low in fertility.

Killian soils adjoin the Lakeland, Norfolk, Rains, and Vaucluse soils and in some ways resemble them. They have a much finer textured and firmer subsoil than the Lakeland, Norfolk, and Rains soils and are more mottled, paler colored, and finer textured in the subsoil than the Norfolk soils. Killian soils are better drained than the Rains soils and are not so gray in the subsoil nor so dark in the surface layer. Although similar to the Vaucluse soils in texture, Killian soils are yellow in the subsoil rather than yellowish red to red.

In this county the Killian soils are mainly in large and small areas in the northern part, but a few small areas are in other parts. These soils are slow in permeability and infiltration and are medium to low in available moisture capacity. However, they can supply ample moisture for trees because they are underlain by a ground-water stratum.

Killian loamy sand, 2 to 6 percent slopes (KbB).--This is a moderately well drained and somewhat poorly drained, fine-textured, clayey soil.

Profile description:

0 to 9 inches, dark-gray, loose loamy sand.
9 to 27 inches, pale-brown, firm, kaolinitic clay with reddish-brown and reddish-yellow mottles.
27 to 40 inches, mottled, very pale brown, light reddish-brown, and brownish-yellow, sandy clay material that is high in kaolin.

The surface layer of this soil ranges from 9 to 14 inches in thickness and from dark gray to light brownish gray in color. The subsoil is very pale

brown to pale yellow and is firmer in some places than it is in others. Included with this soil in areas too small to be mapped separately are a few areas of Killian loamy sand, thick surface, 2 to 6 percent slopes. Also included are a few small areas of the Vaucluse and the Lakeland soils.

This soil generally is not in good tilth. Its subsoil is slowly permeable and does not absorb water so readily as does the loamy sand surface layer. The surface layer retains free water for a considerable time after rains and thus prevents working for some time. Runoff is medium to slow. The available moisture capacity is medium to low because the content of kaolin is high. In the underlying sandy substratum, however, ground water is available for trees. The erosion hazard is slight to moderate. This soil is low in fertility and does not respond to fertilization. Nevertheless, yields and the amount of crop residue can be increased somewhat by heavy fertilization. The residue turned under increases the organic-matter content and, together with contour cultivation, helps control erosion.

Generally, this soil is not well suited to crops, and large areas have reverted to loblolly pine. The trees grow rapidly and, if seed trees are nearby, reseed naturally. Many areas are planted to corn, small grains, soybeans, millet, and some cotton. Bermudagrass and bahiagrass are suitable pasture grasses, and sericea lespedeza is a suitable perennial legume. Ponds can be dug in this soil in many areas that have a water-bearing stratum and a sufficient hydrostatic head within 20 feet of the surface. Sites good for pond dams are along many of the drainageways and streams in this soil. (Capability unit IIe-4; woodland suitability group 3)

Killian loamy sand, 6 to 10 percent slopes (KbC).--This soil is similar to Killian loamy sand, 2 to 6 percent slopes, in most characteristics, but it is more sloping than that soil. Runoff is medium, and the erosion hazard is moderate. More intensive practices are required to control erosion. Row crops should not be planted more than once in 3 years, and contour cultivation with adequate disposal of water should be established. This soil has a small total acreage and is mostly wooded. (Capability unit IIIe-4; woodland suitability group 3)

Killian loamy sand, 6 to 10 percent slopes, eroded (KbC2).--This strongly sloping soil is more eroded than Killian loamy sand, 2 to 6 percent slopes, and its surface layer varies more in thickness. The surface layer is 3 to 9 inches thick. In some small areas the plow layer extends into the clayey subsoil. All of the surface layer has washed away in a few small areas, and the subsoil is exposed. Runoff is greater than on the less sloping Killian soils, and infiltration is less. This soil occurs in small, narrow areas, mostly in woods along drainageways. The total acreage is small. Unless the soil is kept in permanent vegetation, the erosion hazard is severe. (Capability unit IVe-4; woodland suitability group 3)

Killian loamy sand, 10 to 15 percent slopes (KbD).--This steep soil is somewhat similar to Killian loamy sand, 2 to 6 percent slopes, but it has a thinner subsoil in many places. This soil is in narrow, wooded areas along drainageways and has a small total acreage. The erosion hazard would be severe if this soil were cultivated. (Capability unit IVe-4; woodland suitability group 3)

Killian loamy sand, thick surface, 2 to 6 percent slopes (KtB).--This soil has a thicker loamy sand surface layer than that of Killian loamy sand, 2 to 6 percent slopes, but it is similar to that soil in most other characteristics. The thick surface layer can be worked sooner after rains because its content of moisture is less. Shallow-rooted annuals, however, may be damaged in summer because there is not enough moisture. This soil has faster infiltration than the soil with a thinner surface layer. The organic-matter content is low. The erosion hazard is moderate, but it can be lessened by increasing organic matter, by adding fertilizer, by turning under crop residue, and by tilling on the contour. This soil has a larger acreage than any other Killian soil in the county, and more of it is in cultivation, in pasture, and in hay. (Capability unit IIe-4; woodland suitability group 4)

Killian loamy sand, thick surface, 6 to 10 percent slopes (KtC).--Though this soil is similar to Killian loamy sand, 2 to 6 percent slopes, it differs from that soil in the same characteristics as does Killian loamy sand, thick surface, 2 to 6 percent slopes. This more sloping soil has more rapid runoff and is slightly more droughty because of its low available moisture capacity. The surface layer is underlain by a firm, clay subsoil.

This soil has a small total acreage, which is mostly along drainageways. Almost all of it is wooded. If the soil is cultivated, the erosion hazard is moderately severe. (Capability unit IIIe-4; woodland suitability group 4)

Lakeland Series

In the Lakeland series are deep to very deep, excessively drained soils that have a sandy texture throughout their profile. These soils have developed in beds of sand of the Coastal Plain. They generally have a grayish-brown surface layer and a yellowish-brown subsoil. The subsoil is more than 24 inches thick. The Lakeland soils are low in available moisture capacity, are low in fertility and organic matter, and are strongly acid. Slopes range from 0 to 15 percent.

In many places the Lakeland soils adjoin the Eustis, Norfolk, Ruston, Vaucluse, Caroline, and Killian soils and in some ways resemble them. They resemble the Eustis soils in texture, but their subsoil is yellow instead of yellowish red. The surface layer and subsoil are coarser textured in the Lakeland soils than in the Norfolk soils but are similar in color. The subsoil is coarser textured in the Lakeland soils than in the Ruston, Vaucluse, and Caroline soils and is yellow instead of brown. Lakeland soils are much coarser textured and are better drained than the Killian soils and lack their mottled color and firm, clay subsoil.

The Lakeland soils are among the most extensive in this county. Their total area is 57,592 acres, or almost one-fourth of the county. Most of this

acreage is in the northeastern third, but many areas occur elsewhere. The native vegetation was longleaf pine with an understory of blackjack oak and a few other hardwoods. Where the pine has been cut over, blackjack oak is dominant. The Lakeland soils are not farmed intensively, and much of their acreage has grown up in broomstraw and other wild plants. Only about half of the less sloping acreage is cultivated. Because these soils are very sandy and droughty, their productivity is limited.

Lakeland sand, 0 to 6 percent slopes (LkB).--This soil is deep and excessively drained.

Profile description:

0 to 6 inches, very dark grayish-brown, loose sand.
6 to 21 inches, yellowish-brown, loose sand.
21 to 48 inches, strong-brown, loose sand.
48 to 72 inches +, brownish-yellow or very pale brown, loose sand.

The surface layer ranges from very dark grayish brown to grayish brown, its color depending on the amount of organic matter. The subsoil ranges from brownish yellow to yellowish brown and strong brown. The brown is more noticeable in areas that grade toward the Eustis or Ruston soils, or in areas underlain by beds of reddish soil material. Included are a few areas of loamy sand that are too small to be mapped separately. Firm sandy loam or sandy clay is at a depth of 3 to 10 feet or more and is at a greater depth in the rolling Sandhills part of the county.

This soil has rapid infiltration and very rapid permeability. Water percolates through the soil at a rate of 10 inches or more per hour and excessively leaches natural and applied plant nutrients and organic matter. Droughtiness is the chief hazard because this soil does not hold enough moisture to meet the needs of desirable plants. Runoff is not a hazard.

This soil is not well suited to crops, especially those that need a good supply of moisture in summer. Soil blowing is sometimes serious in areas of dry or freshly plowed soil, for crop rows drift and young plants are damaged. This soil amounts to about 11 percent of the county, or approximately 26,373 acres. It occurs in large and small areas. Less than half the acreage is cultivated or pastured; most of it is cutover woodland that has grown up in blackjack oak. Much of the soil has been planted to slash pine or has reseeded naturally to longleaf pine. Some corn, cotton, small grains, and soybeans are grown, but yields are low even if the soil is fertilized heavily. Pasture of bermudagrass and bahiagrass is fairly good. Most cultivated fields are in nearly level areas where there is slightly more moisture available because the sandy clay is commonly 3 to 6 feet below the surface. (Capability unit IVs-1; woodland suitability group 1)

Lakeland sand, 6 to 10 percent slopes (LkC).--In this strongly sloping soil the firm sandy clay is at a more variable depth than is the clay in Lakeland sand, 0 to 6 percent slopes. In the higher areas, the clay is normally at a greater depth than it is in lower areas along the draws. Consequently, more moisture is available on the lower slopes. Most of this soil is wooded or is idle. If the permanent vegetation is removed, the erosion hazard would increase. (Capability unit IVs-1; woodland suitability group 1)

Lakeland sand, 10 to 15 percent slopes (LkD).--The depth to the underlying sandy clay is more variable in this soil than it is in Lakeland sand, 0 to 6 percent slopes. In most places the sandy clay is 3 to 4 feet from the surface, but in a few places too small to be mapped separately, it occurs at a depth of 30 to 36 inches. Also included with this soil are areas of Vaucluse, Caroline, and Killian soils that are too small to be mapped separately. Leaching and erosion are severe hazards on this soil. On some slopes ground water is available for good growth of trees. Practically all of this soil is wooded; it should not be cleared for cultivation. (Capability unit VIIs-1; woodland suitability group 1)

Lakeland sand, shallow, 0 to 2 percent slopes (LsA).--In this nearly level soil the sandy loam or sandy clay is nearer the surface than it is in Lakeland sand, 0 to 6 percent slopes. The depth is generally between 30 and 36 inches but is as much as 42 inches in a few places. Included with this soil are a few areas of loamy sand too small to be mapped separately. Also included are a few small areas of Norfolk sandy loam, thick surface.

This shallow soil has very little runoff. It is leached less and supplies a little more water to plants than does Lakeland sand, 0 to 6 percent slopes. Also, it contains more organic matter and is more fertile and productive. More than half of this inextensive soil is cultivated, is pastured, or is used for hay.

The principal crops grown on this soil are cotton, corn, small grains, and soybeans. Bermudagrass, bahiagrass, and sericea lespedeza are the main plants grown for pasture or hay. The native vegetation consisted of desirable hardwoods and pines. Blackjack oak does not dominate the cutover areas. Pine grows well on this soil and reseeds naturally in many places. Many areas have been planted to slash pine. (Capability unit IIIs-1; woodland suitability group 2)

Lakeland sand, shallow, 2 to 6 percent slopes (LsB).--This soil differs from Lakeland sand, 0 to 6 percent slopes, in about the same way as does Lakeland sand, shallow, 0 to 2 percent slopes. Its area, about 14,000 acres, is about eight times as large as that of the less sloping soil. Tree roots penetrate this soil to a depth of 3 feet (fig. 14). (Capability unit IIIs-1; woodland suitability group 2)

Lakeland sand, shallow, 6 to 10 percent slopes (LsC).--The sandy loam or sandy clay is nearer the surface in this more sloping soil than it is in Lakeland sand, 0 to 6 percent slopes. The depth to this material is generally between 30 and 36 inches, but in a few places it is as much as 42 inches. Included with this soil in areas too small to be mapped separately are a few areas of deeper Lakeland sand and a few areas of the Killian, Vaucluse, and Ruston soils.

This soil has enough moisture for trees and is mostly wooded. Clearing the soil would likely increase runoff, erosion, and droughtiness. (Capability unit IVs-1; woodland suitability group 2)

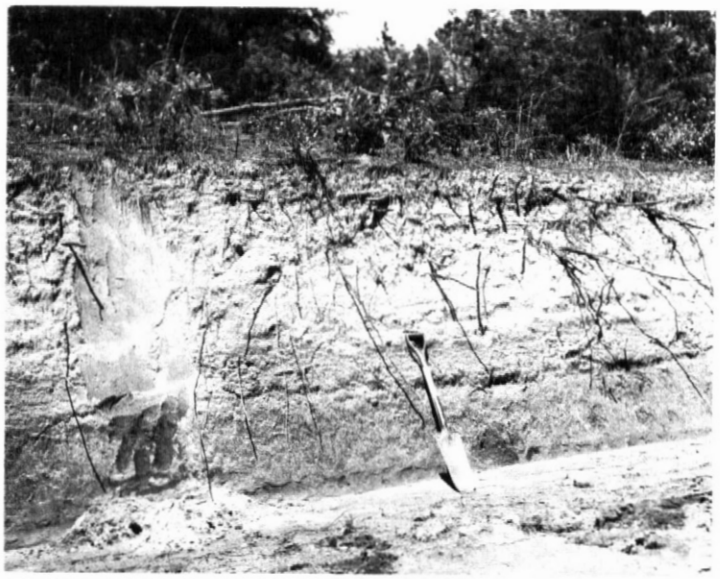

Figure 14.--Penetration of tree roots to a depth of 3 feet in Lakeland sand, shallow, 2 to 6 percent slopes.

Lakeland sand, shallow, 10 to 15 percent slopes (LsD).--In this strongly sloping soil the sandy loam or sandy clay is at a depth of 30 to 36 inches and is nearer the surface than is the sandy loam or sandy clay in Lakeland sand, 0 to 6 percent slopes. Runoff is greater on this soil, and cleared areas are likely to erode. On some slopes, trees are supplied additional moisture from ground water.

Practically all of this soil is wooded. Pine grows fairly well, but the soil is not suited to cultivation. (Capability unit VIs-1; woodland suitability group 2)

Lakeland loamy sand (La).--Loamy sand extends throughout the entire profile of this soil, which has slopes of 0 to 2 percent. The soil has developed in loamy sand sediments that were laid down as terraces along estuaries close to the flood plain of the Congaree River and in areas along the large creeks of the county. Except for texture, this soil is similar to Lakeland sand, 0 to 6 percent slopes. It can, however, supply slightly more moisture to crops, for it has a slightly higher available moisture capacity and practically no runoff. The two soils are suited to the same kinds of crops, but if the same amount of fertilizer is applied to each, yields are slightly higher on Lakeland loamy sand than on Lakeland sand, 0 to 6 percent slopes.

Lakeland loamy sand has a small total acreage and is in small areas. It is suited mainly to cotton, small grains, soybeans, and pasture. A few areas are in pine. Pasture plants that grow well are Coastal bermudagrass, bahiagrass, and sericea lespedeza. (Capability unit IVs-1; woodland suitability group 2)

Local Alluvial Land

Local alluvial land has variable characteristics. It consists of alluvial and colluvial material that has been washed from the adjacent soils on uplands of the Coastal Plain. This alluvial and colluvial material is in small depressions and along intermittent drainageways and draws. Its slopes range from 0 to 2 percent.

Local alluvial land (Lv).--According to the kind of soil it overlies, Local alluvial land ranges from well drained to somewhat poorly drained. In most places it is moderately well drained. Included with this soil are a few small areas that are poorly drained and small areas of Mixed alluvial land. Where Local alluvial land occurs with the Greenville, Magnolia, Orangeburg, and Faceville soils, it is generally well drained or moderately well drained. Where it occurs with other soils, it is generally moderately well drained or somewhat poorly drained.

The depth to the original underlying material is generally between 12 and 30 inches but is as much as 40 inches in a few places. Because the soil materials in this land have been transported only short distances, the texture and color are closely similar to those of the adjacent soils from which the materials have washed. Texture ranges from sand to loam. It is generally sand and loamy sand in areas near the Lakeland, Eustis, thick-surfaced Norfolk soils, and other coarse-textured soils. Sandy loam and loam are generally dominant in areas of Local alluvial land near the Norfolk or Magnolia soils and other soils that have a clay subsoil.

The color of the surface layer ranges from dark gray or dark grayish brown to very dark gray or grayish brown and depends on the amount of organic matter contained and on the color of the adjacent soils. Local alluvial land is similar to the Grady, Coxville, Rains, and Portsmouth soils and, in places, is in positions similar to the positions of those soils. It lacks, however, the distinctly developed horizons of those soils, and its layers underlying the surface layer are generally loose.

The available moisture capacity of this land is generally medium, but it ranges from low to high. Runoff is slow, and in places water stands on the surface for long periods, especially in areas that do not have natural outlets and are not artificially drained. Permeability varies but is generally moderate. This land type can supply a large amount of water to plants because runoff is slow and the runoff and seepage from the surrounding uplands are concentrated. The soil material is high in plant nutrients, is high to medium in organic matter, and is generally strongly acid.

In this county Local alluvial land (fig. 15) has a total area of 3,431 acres. It occurs in small areas that generally range from 1 to 5 acres in size but that are as much as 10 to 15 acres in a few places. The larger areas are long and narrow in most places and can be tilled separately. In many places the small areas are tilled with the surrounding soils. Excess water is the principal hazard in the use of this land. In most areas artificial drainage is needed, and in some areas the runoff from higher areas should be diverted. If this land is adequately drained, it can be cultivated intensively and is suited to most locally grown crops, including most truck crops. It is well suited to

Figure 15.--Small area of Local alluvial land that has been drained. The soils surrounding it are the Lakeland and Norfolk soils.

grasses grown for pasture and hay. It is especially well suited to pasture grasses, corn, and other plants that require a large amount of moisture.

Cotton produces good yields on this soil, but it is subject to damage from insects and diseases because its growth is generally so rank. Near sloping areas of surrounding uplands, this land is used as an outlet for terraces in many places and therefore is generally kept in bahiagrass, sericea lespedeza, or other continuous or perennial, close-growing plants. A few areas have reverted to trees, which grow rapidly. (Capability unit IIw-1; woodland suitability group 5)

Lynchburg Series

Soils of the Lynchburg series are somewhat poorly drained. In most places they have a very dark grayish-brown surface layer and a light yellowish-brown subsoil that is mottled in the lower part. These soils have developed in beds of sandy loam and sandy clay loam of the lower Coastal Plain. They are medium in fertility and are strongly acid. Slopes range from 0 to 2 percent.

The Lynchburg soils adjoin the Norfolk, Goldsboro, Rains, and Portsmouth soils and are similar to them in texture. Compared to the Goldsboro soils, Lynchburg soils are less well drained, are darker gray in the surface layer, and have a thinner upper subsoil of uniform yellowish brown. Also, the depth to the gray and mottled colors is less. Lynchburg soils are better drained than the Rains and Portsmouth soils. They are uniformly yellowish brown in the upper subsoil and, unlike the Rains soils, do not have gray and mottled colors directly beneath the surface layer. They lack the thick, black surface layer and the gray subsoil of the Portsmouth soils. Lynchburg soils are coarser textured and better drained than the Coxville soils, which they frequently adjoin, and they lack the common, red mottles of those soils.

The Lynchburg soils in this county occur in large areas south of Creston and Cameron, in the southern part of the county. Their native vegetation was mostly loblolly and pond pines and a mixture of oak, hickory, and gum. Although much of the acreage is now cutover woodland containing these mixed native trees, many areas have been cleared, drained, and put into cultivation. The soils are productive because they are nearly level and have a thick, permeable root zone with ample available moisture.

Lynchburg sandy loam (Ly).--This is a level, somewhat poorly drained soil of the lower Coastal Plain.

Profile description:

0 to 8 inches, very dark grayish-brown, friable sandy loam.
8 to 13 inches, dark grayish-brown, friable loamy sand.
13 to 25 inches, light yellowish-brown, friable sandy loam.
25 to 36 inches, light brownish-gray sandy clay loam mottled with strong brown.

The depth to the mottled layer ranges from 16 to 26 inches. The depth is greater where this soil grades toward the Goldsboro soils and less where the soil grades toward the Rains soils. Included with this soil in areas too small to be mapped separately are a few areas of fine sandy loam and loamy sand. In other included areas the subsoil is sandy loam to sandy clay loam. Also included are a few areas of the Goldsboro, Rains, and Portsmouth soils that are too small to be shown on the map.

Lynchburg sandy loam is moderately permeable in the upper 16 to 26 inches. Permeability is moderately slow in the lower part of the profile. Because of the nearly level slopes, surface runoff is slow. Infiltration is moderate, and the available moisture capacity is medium. Because the water table is only 18 to 24 inches from the surface at times, crops are likely to be damaged by excess water unless this soil is adequately drained. Areas with well-established drainage (fig. 16), have a deep, permeable, well-aerated root zone that supplies ample moisture for intensive cultivation. Most crops need and respond well to fertilization and liming. Although tilth is generally good, the soil cannot be worked soon after rains.

Because this nearly level soil occurs in large, broad areas, extensive ditching is needed. In many places, however suitable outlets are not nearby. In a few places sand in the subsoil or in the underlying material causes steep banks of ditches to cave in. These ditches require additional maintenance until drainage is well established.

Most of the approximately 5,281 acres of Lynchburg sandy loam in the county is in cutover woodland. Much of this woodland is still productive. Pine grows well on this soil. Large areas, however, have been cleared, drained, and planted to crops, mainly to cotton, corn, small grains, soybeans, and truck crops, as well as annual and permanent hay and pasture. The soil is well suited to these

Figure 16.--Adequate drainage on Lynchburg sandy loam.

crops and pasture plants. It is not suited to fruit or nut orchards, nor is it well suited to deep-rooted crops. Sites suitable for sweetpotatoes and for constructing dug ponds generally can be found on this soil. (Capability unit IIw-2; woodland suitability group 7)

Magnolia Series

In the Magnolia series are deep, well-drained soils that have a reddish-brown surface layer and a red, friable, sandy clay loam subsoil. These soils have developed in beds of fine sandy clay and clay on the upper and middle Coastal Plain. They are high in fertility, are medium acid, and are productive. Slopes range from 0 to 15 percent.

The Magnolia soils adjoin the Greenville, Faceville, Marlboro, Orangeburg, Ruston, and Caroline soils and in some ways resemble them. The texture of the subsoil in the Magnolia soils is similar to that in the Greenville, Faceville, and Marlboro soils. The Magnolia soils are thicker in the surface layer then the Greenville soils and are not so dark red in the surface layer and upper subsoil. The subsoil of the Magnolia soils is red, but that of the Faceville soils is yellowish red and that of the Marlboro soils is strong brown to yellowish brown. Compared to the Orangeburg and Ruston soils, Magnolia soils are finer textured throughout the profile. They are redder in the surface layer than the Orangeburg soils and, unlike the Ruston soils, are red in the subsoil instead of yellowish red. Magnolia soils are generally redder and coarser textured in the subsoil than the Caroline soils and lack their noticeable firm consistence and blocky structure.

The Magnolia soils are extensive in this county. They are mostly in the central part but are in scattered areas elsewhere. Their native vegetation was mixed stands of pines and hardwoods, but nearly all of the acreage except that on steep slopes has been cleared and is cultivated. Because of their thick root zone, good tilth, and good available moisture capacity, the less sloping areas of the Magnolia soils are well suited to many kinds of locally grown crops.

Magnolia sandy loam, 2 to 6 percent slopes (MgB).--This is a deep, well-drained, red soil of the Coastal Plain.

Profile description:

0 to 11 inches, reddish-brown, very friable sandy loam.
11 to 15 inches, red, friable sandy clay loam.
15 to 66 inches, dark-red, friable and slightly sticky sandy clay.

The surface layer ranges from 8 to 12 inches in thickness. It varies only slightly in color and is darkest where there is the most organic matter. Included with this soil, in a few places, are eroded areas where the surface layer is thin and the plow layer extends into the red subsoil. Also included are areas of the Orangeburg soils and of Local alluvial land. The inclusions are too small to be mapped separately.

This soil has a thick, moderately permeable root zone and is generally in good tilth. It can be worked within a wide range of moisture content, but not within so wide a range as can well-drained, coarser textured soils that have a sandy loam subsoil. The available moisture capacity of this soil is medium, but it is high enough to supply enough moisture for most crops. The erosion hazard is slight because the soil has medium runoff, gentle slopes, and a moderate infiltration rate. Some soil blowing occurs early in spring in areas that are exposed, dry, and freshly plowed.

This soil has a large total acreage. It is high in natural fertility and responds well to fertilizer. Generally, it contains a medium amount of organic matter and is in good tilth. Its smooth, gentle slopes and large areas are well suited to mechanized farming. If this soil is adequately fertilized and well managed, it is suited to most of the locally grown crops and use can be moderately intensive. Practices that help to control runoff and erosion include contour cultivation; maintaining permanently vegetated waterways; and, where slopes are long enough, terracing and stripcropping. (Capability unit IIe-2; woodland suitability group 3)

Magnolia sandy loam, 0 to 2 percent slopes (MgA).--This nearly level soil is similar to Magnolia sandy loam, 2 to 6 percent slopes, in most characteristics. The surface layer generally ranges from 10 to 12 inches in thickness. It is slightly darker than the surface layer of the more sloping soil because it contains more organic matter. Surface runoff is slow, and the erosion hazard is slight.

This soil occurs in rather large areas and is well suited to intensive production of all crops grown in the county. To keep this soil productive, it is necessary only to add fertilizer and to mix organic matter with the soil by plowing under crop residue and cover crops. (Capability unit I-2; woodland suitability group 3)

Magnolia sandy clay loam, 2 to 6 percent slopes, severely eroded (MaB3).--This soil is similar to

Magnolia sandy loam, 2 to 6 percent slopes, in many characteristics, but most of the original sandy loam surface layer has been washed away and its thin remnants have been mixed with the red, sandy clay loam subsoil. In some places 12 inches or more of the subsoil has been lost through erosion. Included with this soil in places too small to be mapped separately are a few areas in which the original surface layer is 4 or 5 inches thick. A few gullies or washes are present.

This soil has slow infiltration because of its fine-textured surface layer and low organic-matter content. Runoff is medium but is considerably greater than on Magnolia sandy loam, 2 to 6 percent slopes. This soil is generally in poor tilth and cannot be cultivated soon after rains. Natural fertility is low. The soil does not respond so well to fertilization as the less eroded soil, and it produces lower yields.

This severely eroded soil has a small total acreage and is in small areas. Some areas are cultivated and may be worked along with other Magnolia soils. Some are in woods or pasture. Additional organic matter mixed into the plow layer of this soil improves tilth and the response to fertilizer. The organic matter can be supplied by frequently plowing under the cover crops in the cropping system and by allowing all crop residue to remain on the soil. Heavy fertilization indirectly increases organic matter by increasing crop growth and root development. (Capability unit IIIe-2; woodland suitability group 13)

Magnolia sandy clay loam, 6 to 10 percent slopes, severely eroded (MaC3).--This soil differs from Magnolia sandy loam, 2 to 6 percent slopes, in the same characteristics as does Magnolia sandy clay loam, 2 to 6 percent slopes, severely eroded. In addition, it is on shorter, stronger slopes and has more rapid runoff. It occurs in small areas, most of which have reverted to woods. Some areas are cultivated, however, and some are in pasture or perennial hay. The erosion hazard is severe, and this soil is not suited to cultivation. It should remain in woods or other perennial plants. (Capability unit IVe-1; woodland suitability group 13)

Magnolia sandy clay loam, 10 to 15 percent slopes, severely eroded (MaD3).--This strongly sloping soil differs from Magnolia sandy loam, 2 to 6 percent slopes, in the same characteristics as does Magnolia sandy clay loam, 2 to 6 percent slopes, severely eroded. In many places the subsoil is thinner than that of the less sloping soil. It ranges from 2 to 3 feet in thickness. Runoff is rapid, and infiltration is slow. This soil has a small total acreage, most of which has reverted to woods. It is not suited to cultivation. (Capability unit VIe-1; woodland suitability group 13)

Magnolia sandy loam, 2 to 6 percent slopes, eroded (MgB2).--This eroded soil has a thinner surface layer of less uniform thickness than that of Magnolia sandy loam, 2 to 6 percent slopes. The surface layer ranges from 4 to 9 inches in thickness. The red subsoil is part of the plow layer in many places, and in a few small washes it is exposed. Because of the washes, some slopes are not so smooth as those on the noneroded soil. Small areas of Local alluvial land along drains are included with this soil.

Surface runoff, which is medium, is slightly greater on the eroded soil than on the noneroded one, and infiltration is slightly less. Thus, the erosion hazard is moderate to severe. Cover crops and heavy fertilization increase organic matter and help control erosion. (Capability unit IIe-2; woodland suitability group 3)

Magnolia sandy loam, 6 to 10 percent slopes (MgC).--This soil is more sloping than Magnolia sandy loam, 2 to 6 percent slopes, but is similar to that soil in most other characteristics. The subsoil, however, is thinner in some places than that of the gently sloping soil, and slopes are much shorter. The subsoil ranges from 3 to 4 feet in thickness.

Much of the small total acreage of this soil is in permanent vegetation such as pasture and hay, perennial legumes, and trees. Some areas are planted to small grains and soybeans; only a small acreage is in row crops. The erosion hazard is moderate to severe in cultivated areas. Because slopes are steeper, runoff is greater on this soil than on the less sloping soil. Consequently, more intensive practices are required to lessen runoff and erosion. For example, a rotation can be used that keeps the soil in close-growing crops 2 years in 3. (Capability unit IIIe-2; woodland suitability group 3)

Magnolia sandy loam, 6 to 10 percent slopes, eroded (MgC2).--This soil is steeper and more eroded than Magnolia sandy loam, 2 to 6 percent slopes, but is similar to that soil in most other characteristics. It has, however, a thinner surface layer that is of less uniform thickness and that ranges from 4 to 9 inches in thickness. In many places the plow layer extends into the red subsoil, and in some places the subsoil is thinner and ranges from 3 to 4 feet in thickness. The red subsoil is exposed in small washes. Included along the drains are a few small areas of Local alluvial land. The small total acreage of this soil is in small- to medium-sized areas on short slopes that are irregular in some places because of the washes.

Surface runoff is medium but is greater than that on Magnolia sandy loam, 2 to 6 percent slopes, because of the stronger slopes and slower infiltration into the thin surface layer.

Much of this soil is in trees that have reseeded naturally, and much is in pasture and other perennial plants. Cotton, soybeans, and small grains are grown in some places, but erosion is a severe hazard in cultivated areas. In addition to contour tillage and water disposal, a cropping system providing a high percentage of close-growing crops helps reduce runoff and erosion. One such system is 2 years of grain and lespedeza and 1 year of cotton or corn. (Capability unit IIIe-2; woodland suitability group 3)

Magnolia sandy loam, 10 to 15 percent slopes, eroded (MgD2).--This soil is steeper and more eroded than Magnolia sandy loam, 2 to 6 percent slopes, but is similar to that soil in most other characteristics. The surface layer, however, is thinner and of less uniform thickness than that of

the less sloping soil. It ranges from 4 to 9 inches in thickness. In some places the plow layer extends into the red subsoil, and in a few places the red subsoil is exposed. In places the subsoil is thinner than that in the less sloping soil and ranges from 3 to 4 feet in thickness.

This soil has a small total acreage and is in small areas. Slopes are short and irregular because of washing. Surface runoff is rapid, and infiltration is slow. Most of this soil has reverted to trees; only a small part is in pasture or other perennial plants. The soil is not suited to cultivation, but it can be used for permanent pasture if grazing is limited and well managed. Or it can be kept in sericea lespedeza or another perennial. Heavy fertilization is needed. Pine is suited to this soil and grows fairly well. (Capability unit IVe-1; woodland suitability group 3)

Marlboro Series

Soils of the Marlboro series are well drained and in most places have a dark-gray, fine sandy loam surface layer and a strong-brown, friable, clay loam subsoil. These soils have developed in beds of fine sandy clay and clay in the middle part of the Coastal Plain. They are high in fertility and are medium acid. The slopes range from 0 to 6 percent.

The Marlboro soils commonly adjoin the Norfolk, Magnolia, Faceville, and Dunbar soils and in some ways resemble them. They are similar to the Norfolk soils in color but are finer textured throughout the profile. Marlboro soils have a texture similar to that of the Magnolia and Faceville soils, but their subsoil is yellow and their surface layer is grayer. Marlboro soils are similar to the Dunbar soils in texture and in color, but the Marlboro are better drained, do not have mottles in the lower subsoil, and occur at a higher elevation.

In this county, Marlboro soils have a small total acreage and occur in the central part. Their native vegetation was mixed stands of pines and hardwoods, but now nearly all of the acreage is cultivated. These soils have a thick root zone, are naturally fertile, generally are in good tilth, and can supply ample moisture to plants. Consequently, they are well suited to a wide range of locally grown crops and are productive.

Marlboro fine sandy loam, 0 to 2 percent slopes (MrA).--This soil is deep, well drained, and friable.

Profile description:

0 to 8 inches, very dark gray, friable fine sandy loam.
8 to 11 inches, light yellowish-brown, very friable fine sandy loam.
11 to 40 inches, strong-brown to yellowish-brown, friable clay loam.

The surface layer ranges from 9 to 13 inches in thickness and from very fine sandy loam to fine sandy loam in texture. It is dark gray or grayish brown, its color depending on the content of organic matter. The subsoil ranges from yellowish brown to strong brown and in some places is fine sandy clay. Included with this soil are areas of the Norfolk and Faceville soils that are too small to be mapped separately.

This soil has a thick, fine-textured, friable root zone that contains a good supply of plant nutrients and can supply ample moisture to plants. The soil responds well to heavy fertilization. Runoff is slow on this nearly level soil, but infiltration is moderate because the subsoil is moderately permeable. This soil is ordinarily in good tilth and can be worked fairly soon after rains. It is well suited to mechanized farming because it has smooth, regular slopes and is in large areas.

This soil can be farmed intensively. Heavy applications of fertilizer increase root growth and crop residue and thus build up organic matter. The total acreage is small, but practically all of it is in cultivation. Only a few small patches are in woods. The principal crops are cotton, corn, soybeans, and small grains. (Capability unit I-2; woodland suitability group 3)

Marlboro fine sandy loam, 2 to 6 percent slopes (MrB).--This gently sloping soil is similar to Marlboro fine sandy loam, 0 to 2 percent slopes, in most characteristics. Runoff is medium, and the erosion hazard is slight to moderate. This hazard can be reduced by tilling on the contour and, to increase organic matter, by rotating well-fertilized crops. All of the small acreage of this soil is in cultivated crops, mainly cotton, corn, soybeans, and small grains. (Capability unit IIe-2; woodland suitability group 3)

Mixed Alluvial Land

Mixed alluvial land varies in its characteristics. It consists mainly of alluvial material, but some colluvial material is included. All of this material has been washed from the soils of the Coastal Plain and has been deposited by floodwater along the creeks and smaller streams throughout the county.

Mixed alluvial land (Mx).--Most of this land is poorly drained, but some is somewhat poorly drained to very poorly drained. The drainage is so varied and intricate that it is not practical to map the different areas separately. Mixed alluvial land ranges from sand to silty clay in texture but is generally loamy sand. In many places these materials are stratified. In most places color ranges from gray to black, but it is brown or reddish brown where the material has been washed from the Magnolia and other red soils of the uplands. In many places the material is light or bluish gray and, because of wetness, has started to mottle. The color is uniform in areas of recently deposited materials. Small areas of Swamp are included with this land.

Mixed alluvial land generally contains large amounts of organic matter and is strongly acid. A few small areas have been cleared for pasture; the rest is in woods. The trees are mainly sweetgum, blackgum, poplar, hickory, water oak, white oak, and red oak, and there are a few loblolly pines. This land is best suited to trees because it is frequently flooded and is difficult to drain. (Capability unit IVw-4; woodland suitability group 14)

Myatt Series

The soils of the Myatt series are deep, nearly level, gray, and poorly drained. They have developed in beds of sandy loam to light sandy clay that were washed from the upland soils of the Coastal Plain and deposited as stream terraces. The soils are low in fertility, are high in organic matter, and are strongly acid. They have a high water table. In wet periods the water table rises to within 12 inches of the surface, but in dry periods it falls to 30 to 36 inches. Slopes range from 0 to 2 percent.

The Myatt soils adjoin the Kalmia, Izagora, and Okenee soils and are the poorly drained members of this catena, or drainage sequence, of soils on stream terraces. All these soils have similar texture, but the Myatt soils are more poorly drained than the Kalmia and Izagora soils and are better drained than the Okenee. The depth to light-gray and mottled colors is 10 to 14 inches in the Myatt soils and is 18 to 24 inches in the Izagora soils, but normally the Kalmia soils are not mottled. Myatt soils lack the black surface layer of the Okenee soils and are above them on the slopes. They are below the Kalmia and Izagora soils.

Most of the Myatt soils in this county are near the Congaree River, in the northern tip, but a few small areas are along large streams elsewhere. The native vegetation was blackgum, sweetgum, water-loving oak, and some loblolly and pond pines. Most of the acreage is cutover woodland; small areas that were cleared have reverted to trees. Many areas have been ditched along with adjoining Izagora soils for malaria control. Because of the thick, permeable root zone and a high water table that assures ample moisture, these soils are well suited to trees, especially if they are drained.

Myatt loamy sand (My).--This is a poorly drained soil of the stream terraces.

Profile description:

0 to 6 inches, dark-gray, friable loamy sand.
6 to 13 inches, light-gray, friable loamy sand.
13 to 36 inches, light-gray, friable to firm sandy clay with many yellowish-brown mottles.

The texture of the subsoil ranges from sandy loam to sandy clay. In a few places that are too small to be mapped separately, mostly along small streams, the subsoil is loamy sand. Included with this soil in some places are small areas of the Okenee and Izagora soils.

Because of the high water table, the available moisture supply is high. Surface runoff is very slow, since slopes are nearly level, and permeability is moderate to moderately slow. Excess water is the principal hazard, and drainage is needed if the soil is used for pasture or crops. Drainage may not be economically feasible, however, because the soil is low in fertility and is strongly acid. Not only is ground water present in large amounts, but also outlets generally are too far away. Elements are readily leached from applied fertilizer.

Only 1,077 acres of this soil is mapped in the county, and practically all of it is cutover woodland. A few areas have been cleared and used for pasture, but these are reverting to loblolly pine or hardwoods. This soil is well suited to trees and produces good yields of pines and desirable hardwoods. Sites suitable for dug ponds are generally available. (Capability unit IVw-3; woodland suitability group 12)

Norfolk Series

In the Norfolk series are deep, well-drained soils that have a gray to grayish-brown, loamy sand surface layer and a yellowish-brown, friable, sandy clay loam to sandy loam subsoil. These soils developed in beds of sandy loam and sandy clay of the middle and lower Coastal Plain. They are medium to high in fertility and in organic-matter content and are medium acid to strongly acid. Slopes range from 0 to 10 percent.

The Norfolk soils adjoin the Lakeland, Marlboro, Dunbar, Goldsboro, Lynchburg, Coxville, Rains, and Portsmouth soils and in some ways resemble them. Norfolk soils are finer textured and more productive than the Lakeland soils. They have a coarser textured subsoil than the Marlboro and Dunbar soils and are better drained than the Dunbar. Norfolk soils lack the dark-gray to black surface layer of the Rains, Portsmouth, and Coxville soils and are better drained. They are coarser textured than the Coxville soils.

Because the Norfolk soils have a deep, moderately permeable subsoil and rapid infiltration, they can supply ample moisture to plants. These soils are well suited to all the locally grown crops. They are generally in good tilth and are well suited to mechanized farming. Although the native vegetation was mixed stands of pines and hardwoods, most of the acreage is now cultivated. The largest areas of Norfolk soils in this county are in the southern half, but many areas are elsewhere.

Norfolk loamy sand, 0 to 2 percent slopes (NfA).--This deep, well-drained, friable soil is on the Coastal Plain uplands.

Profile description:

0 to 13 inches, grayish-brown loamy sand.
13 to 46 inches, yellowish-brown, friable sandy clay loam or sandy loam.
46 to 60 inches, brownish-yellow, friable sandy clay loam mottled with yellowish red and yellow.

The surface layer ranges from gray to grayish brown according to the content of organic matter. It is loamy fine sand, loamy sand, or light loamy sand. The subsoil normally ranges from sandy loam to sandy clay loam, but in a few areas it is fine sandy clay loam. It ranges from 2 to 3 feet in thickness. Included with this soil are areas of the Marlboro, Killian, Ruston, Goldsboro, Rains, and Portsmouth soils.

This soil has a thick, permeable root zone, is easily tilled, and can be worked within a wide range of moisture content. Infiltration and the available moisture capacity are moderately high, and surface runoff is slow. The erosion hazard is very slight, and no special practices are needed to control erosion. Some soil blowing occurs early in spring in areas that are exposed, dry, and freshly plowed.

This soil contains a medium amount of organic matter, is medium to high in fertility, and is medium acid. It is one of the most extensive and agriculturally important soils of the county and is mostly in the southern third. All locally grown crops can be planted intensively, and the soil responds well to good management and heavy fertilization. (Capability unit I-1; woodland suitability group 3)

Norfolk loamy sand, 2 to 6 percent slopes (NfB).--Although it is more sloping, this soil is similar to Norfolk loamy sand, 0 to 2 percent slopes, in most profile characteristics. The medium runoff causes a slight to moderate erosion hazard. Soil blowing occurs early in spring unless the soil is protected.

This soil is suited to the locally grown crops and to hay and pasture. It occurs extensively throughout most of the county and is practically all in cultivation. Contour cultivation and sodded waterways, suitable cropping systems, and stripcropping of large fields help to reduce surface runoff and to prevent erosion. This soil responds well to good management and heavy fertilization. (Capability unit IIe-1; woodland suitability group 3)

Norfolk loamy sand, 2 to 6 percent slopes, eroded (NfB2).--This eroded soil is more sloping than Norfolk loamy sand, 0 to 2 percent slopes, but is similar to that soil in most other characteristics. Its surface layer, which ranges from 4 to 9 inches in thickness, is thinner and more variable in thickness than that of the more nearly level soil. Because of small washes, slopes are generally not so smooth as those of Norfolk loamy sand, 2 to 6 percent slopes. Included with this soil are small areas where the subsoil is exposed and, along the drains, narrow areas of Local alluvial land. Though the organic-matter content and fertility are medium to high, they are generally slightly lower in this soil than in the more nearly level soil.

This soil is normally in good tilth and is suited to all the locally grown crops. It does not occur in large areas, and its total acreage is small. Pine has reseeded in areas that were once cleared and cultivated. Because runoff is somewhat more rapid on this eroded soil than on the more nearly level one, the erosion hazard is moderate and adequate control is needed. Also, infiltration is somewhat slower. (Capability unit IIe-1; woodland suitability group 3)

Norfolk loamy sand, 6 to 10 percent slopes (NfC).--This soil is somewhat similar to Norfolk loamy sand, 0 to 2 percent slopes, but because it is more sloping, it has more rapid runoff and a greater erosion hazard. Consequently, strong water-control practices are needed in cultivated fields. A suitable cropping system that helps to control erosion is 1 year of a row crop and 2 years of grain and lespedeza.

This soil occurs in small areas and has a small total acreage. It is suited to all the locally grown crops and is especially well suited to hay, pasture, and trees. Because the soil is adjacent to drainageways in many places, it has ample moisture for deep-rooted plants. (Capability unit IIIe-1; woodland suitability group 3)

Norfolk loamy sand, thick surface, 0 to 2 percent slopes (NoA).--This soil has a thicker surface layer than that of Norfolk loamy sand, 0 to 2 percent slopes. It is generally 20 to 24 inches thick but ranges from 18 to 24 inches in thickness. The surface layer ranges from loamy sand to light loamy sand, and in a few areas too small to be mapped separately, it is sand. The subsoil is sandy loam in most places, but it ranges from sandy loam to sandy clay loam.

Because the thick surface layer of this soil is coarse textured, it is low in available moisture capacity and, in places, is too droughty for young and shallow-rooted plants. The subsoil, however, has a moderate available moisture capacity. Soil blowing is more serious on this soil than on Norfolk loamy sand, 0 to 2 percent slopes, and results in more drifting and damage to young plants.

This soil occurs throughout the county in small and large areas and has a considerable total acreage. It is somewhat less suited to crops than is Norfolk loamy sand, 0 to 2 percent slopes, but it is fairly well suited to all the crops commonly grown on that soil. (Capability unit IIs-1; woodland suitability group 4)

Norfolk loamy sand, thick surface, 2 to 6 percent slopes (NoB).--This soil differs from Norfolk loamy sand, 0 to 2 percent slopes, in the same ways as does Norfolk loamy sand, thick surface, 0 to 2 percent slopes, to which it is similar in profile characteristics. It is also similar to Norfolk loamy sand, thick surface, 0 to 2 percent slopes, in available moisture, crop suitability, and susceptibility to soil blowing.

Included with this soil in areas too small to be mapped separately are small areas of Lakeland sand, shallow; Ruston loamy sand, thick surface; and Killian loamy sand.

This soil occurs in large and small areas and is one of the most extensive soils in the county. Although it is suited to the same kinds of crops as Norfolk loamy sand, thick surface, 0 to 2 percent slopes, much of its acreage has been planted to pine. (Capability unit IIs-1; woodland suitability group 4)

Norfolk loamy sand, thick surface, 6 to 10 percent slopes (NoC).--Although it is more sloping, this soil differs from Norfolk loamy sand, 0 to 2 percent slopes, in about the same ways as does Norfolk loamy sand, thick surface, 0 to 2 percent slopes. Crop suitability is limited by medium runoff, a slight erosion hazard, and low available moisture capacity in the surface layer. A large part of this soil has been planted to pine. (Capability unit IIIe-5; woodland suitability group 4)

Norfolk loamy sand, thin solum, 2 to 6 percent slopes (NtB).--The surface soil and subsoil combined are thinner in this soil than in Norfolk loamy sand, 0 to 2 percent slopes. The surface layer is thicker than 5 to 7 inches in only a few places, and it is underlain abruptly by the yellowish-brown, sandy clay loam subsoil. The subsoil generally extends to a depth of 24 inches, but the range in this depth is 18 to 30 inches. The subsoil is underlain by firm, hard, mottled sandy clay that is slowly permeable. It is more sticky and contains more

fine material than the subsoil in Norfolk loamy sand, 0 to 2 percent slopes. Small concretions of iron are scattered on the surface and throughout the profile.

This soil adjoins areas of the Vaucluse, Lakeland, and Norfolk soils in many places. Included with it are areas of those soils that are too small to be mapped separately. The soil occurs in small to large areas in a narrow belt that extends east and west across the county at the foot of the Sandhills.

Because the subsoil is thinner in this soil than it is in Norfolk loamy sand, 0 to 2 percent slopes, less moisture is available to plants. Runoff is medium, and the erosion hazard is moderate. All the locally grown crops are well suited to this soil. Cotton is especially well suited. Pecan and pine trees are likely to be damaged by windthrow because their roots do not hold fast in the hard, firm sandy clay that underlies the subsoil. (Capability unit IIe-1; woodland suitability group 3)

Norfolk loamy sand, thin solum, 2 to 6 percent slopes, eroded (NtB2).--This soil differs from Norfolk loamy sand, 0 to 2 percent slopes, in about the same ways as does Norfolk loamy sand, thin solum, 2 to 6 percent slopes. The surface layer of this more sloping soil ranges from 2 to 5 inches and is thinner than that of Norfolk loamy sand, 0 to 2 percent slopes. Because washes occur, slopes are not so smooth. Runoff is medium, and the erosion hazard is moderate. More careful contour tillage and other water-control practices are needed. (Capability unit IIe-1; woodland suitability group 3)

Norfolk loamy sand, thin solum, 6 to 10 percent slopes (NtC).--This soil differs from Norfolk loamy sand, 0 to 2 percent slopes, in about the same characteristics as does Norfolk loamy sand, thin solum, 2 to 6 percent slopes. It is much more sloping than Norfolk loamy sand, 0 to 2 percent slopes, and has greater runoff. The erosion hazard is moderate to severe. Strong water-control practices are needed, as well as a cropping system that includes close-growing crops. This soil occurs mostly in small areas, many of which can be kept in permanent vegetation. (Capability unit IIIe-1; woodland suitability group 3)

Okenee Series

The Okenee series consists of level, very poorly drained soils that have a thick surface layer of black loam and a dark-gray subsoil. These soils have developed in beds of sandy loam to sandy clay loam material that has been washed from soils on the uplands of the Coastal Plain and deposited as stream terraces. The soils have a high content of organic matter and are very strongly acid. Their water table is near the surface in wet periods. Slopes range from 0 to 1 percent.

The Okenee soils adjoin the Kalmia, Izagora, and Myatt soils of the stream terraces and are the very poorly drained members of the catena, or drainage sequence, that includes those soils. Okenee soils are lower on the slopes than those soils, but are similar to them in texture. They have a thicker and blacker surface layer than the Myatt soils and a higher organic-matter content. They lack the olive-brown and brown colors of the Kalmia and Izagora soils. In many places Okenee soils adjoin the Congaree, Chewacla, and Wehadkee soils on first bottoms and have stronger horizon development. In contrast to these soils of the bottom land, the black surface of the Okenee soils generally does not show the effects of flooding.

In this county, most of the small acreage of these soils is near the Congaree River, in the northern tip of the county. A few small areas are elsewhere in the county along the large streams. The native vegetation is blackgum, sweetgum, poplar, ash, bay, water oak, and some loblolly and pond pines, canes, and myrtle. At present most of the acreage is wooded, but small parts are in dallisgrass pasture and in corn. If these soils are drained, they are productive of many kinds of crops because of the thick surface layer and its high content of organic matter, the ample moisture supplied by the high water table, and the moderate fertility. Hardwoods and loblolly pine produce high yields.

Okenee loam (Ok).--This is a deep, very poorly drained, level soil of the stream terraces.

Profile description:

0 to 22 inches, black, very friable loam.
22 to 55 inches, dark-gray, friable sandy clay loam.

The thickness of the surface layer ranges from 14 to 22 inches. In areas that grade toward the Myatt soils, the surface layer is sandy loam. The subsoil ranges from sandy loam to sandy clay loam.

This soil has a medium to high available moisture capacity, moderate permeability and infiltration in the surface layer, and moderately slow to slow permeability in the subsoil. Runoff is slow, and a large amount of moisture is available to plants. This soil is strongly acid and, if used for pasture or crops, should be limed at a rate indicated by soil tests. It has medium natural fertility and responds to fertilization and other good management. Because excess water is the chief hazard, drainage is needed on fields used for crops or pasture. Adequately drained areas are generally in good tilth and can be worked with machines, but they cannot be worked soon after rains. Drainage is difficult, however, if suitable outlets are not available.

This soil is well suited to corn, soybeans, small grains, and pasture. Desirable hardwoods and pines grow well. Sites suitable for dug ponds are available. (Capability unit IIIw-4; woodland suitability group 11)

Orangeburg Series

Soils of the Orangeburg series are well drained and, in most places, have a yellowish-brown, loamy sand surface layer and a red to dark-red, friable, sandy clay loam subsoil. These soils have developed in beds of unconsolidated sandy loam and sandy clay loam on the uplands of the Coastal Plain. They are medium to high in fertility and are strongly acid. Slopes range from 0 to 15 percent.

The Orangeburg soils commonly adjoin the Magnolia, Faceville, Ruston, and Caroline soils and in some ways resemble them. They have a lighter brown surface layer and a coarser textured subsoil than the Magnolia soils. The Orangeburg soils have a coarser textured and redder subsoil than the Faceville soils and Caroline soils and a redder subsoil than the Ruston soils. The subsoil of the Orangeburg soils is less noticeably blocky in structure than that of the Caroline soils and generally is mottled farther from the surface.

In this county Orangeburg soils are extensive in the central part. Their native vegetation was mixed stands of pines and hardwoods, but nearly all of the acreage is cultivated. Because of a thick root zone, good tilth, and an adequate available moisture capacity, the less sloping areas of these soils are well suited to many kinds of locally grown crops.

Orangeburg loamy sand, 2 to 6 percent slopes (OrB).--This is a well-drained, friable, red soil of the Coastal Plain uplands.

Profile description:

0 to 13 inches, yellowish-brown loamy sand.
13 to 48 inches, red to dark-red, friable sandy clay loam with blocky structure.
48 to 66 inches, red sandy clay loam mottled with brownish yellow.

The surface layer ranges from yellowish brown to dark brown; the color depends on the amount of organic matter. The subsoil ranges from dark red and red to yellowish red in color and from sandy clay loam to sandy loam in texture. Included with this soil in areas too small to be mapped separately are small areas of the Magnolia, Ruston, and Vaucluse soils, and of Local alluvial land. Also included are a few eroded areas.

This soil has a thick, permeable root zone, is easily tilled, and can be worked within a wide range of moisture content. Infiltration is moderately rapid, and the available moisture capacity is moderate. Runoff causes a slight to moderate erosion hazard. Some soil blowing occurs early in spring in areas that are exposed, dry, and freshly plowed. This soil contains a medium amount of organic matter, is medium to high in fertility, and is strongly acid. It is suited to moderately intensive use; responds well to good management, including adequate fertilization; and is suited to most crops commonly grown in the county.

Useful in reducing runoff, and thereby in controlling erosion, are contour cultivation and maintaining sodded waterways and, where the slopes are long enough, terracing and stripcropping. (Capability unit IIe-1; woodland suitability group 3)

Orangeburg loamy sand, 0 to 2 percent slopes (OrA).--This nearly level soil is thicker in the surface layer than Orangeburg loamy sand, 2 to 6 percent slopes, but it is similar to that soil in most other characteristics. The surface layer is generally darker because it contains more organic matter. Runoff is slow, infiltration is high, and the erosion hazard is slight. This soil occurs in rather large areas and is well suited to intensive production of all crops grown in the county. (Capability unit I-1; woodland suitability group 3)

Orangeburg loamy sand, 2 to 6 percent slopes, eroded (OrB2).--The surface layer of this soil is thinner and generally more variable in thickness than that of Orangeburg loamy sand, 2 to 6 percent slopes. It is 4 to 8 inches thick, and in many places the plow layer extends into the red, sandy clay loam subsoil. Small areas are included where the subsoil is exposed. Also included are narrow areas of Local alluvial land along the drains. These inclusions are too small to be mapped separately.

Infiltration is moderate but is somewhat slower than that of Orangeburg loamy sand, 2 to 6 percent slopes, and slopes are not so smooth. Also, organic matter and fertility are slightly lower. This soil has a small total acreage and occurs in small areas. Because of its thick root zone, generally good tilth, and moderate available moisture capacity, the soil is suited to most locally grown crops. In cultivated areas, however, erosion is moderate unless adequate water-control practices are used to help control runoff. (Capability unit IIe-1; woodland suitability group 3)

Orangeburg loamy sand, 6 to 10 percent slopes (OrC).--This soil is more sloping than Orangeburg loamy sand, 2 to 6 percent slopes, and generally has a thinner subsoil. The subsoil ranges from 3 to 4 feet in thickness. Surface runoff is medium, and in periods of low rainfall, there may not be enough moisture available for crops.

This soil occurs in fairly small areas, but the total acreage is considerable. Much of the acreage is in pasture and trees. The soil is subject to erosion if it is cultivated to row crops. It is suited, however, to all locally grown crops, and it responds well to fertilization, good cropping practices, and especially to strong erosion control practices. (Capability unit IIIe-1; woodland suitability group 3)

Orangeburg loamy sand, 6 to 10 percent slopes, eroded (OrC2).--The surface layer of this soil is thinner and generally more variable in thickness than that of Orangeburg loamy sand, 2 to 6 percent slopes. It is 4 to 8 inches thick, and in many places the plow layer extends into the red, sandy clay subsoil. The subsoil ranges from 3 to 4 feet in thickness, and generally is slightly thinner than that of the uneroded soil. Slopes are not so smooth. Because of the steeper slopes and thinner surface soil, runoff is higher and infiltration is somewhat lower on this steeper soil.

Included with this soil are small areas where the subsoil is exposed and, along drains, narrow areas of Local alluvial land.

This soil does not occur in large areas, though it has a large total acreage. It is suited to all locally grown crops but is better suited to pasture or hay. Erosion is a more severe hazard on this soil than on Orangeburg loamy sand, 2 to 6 percent slopes, and strong control practices are required. (Capability unit IIIe-1; woodland suitability group 3)

Orangeburg loamy sand, 10 to 15 percent slopes, eroded (OrD2).--This strongly sloping soil is thinner than Orangeburg loamy sand, 2 to 6 percent slopes, and its surface soil is generally more variable in thickness. The red subsoil is about 3 feet

thick and is exposed in small areas. Runoff is much more rapid on this soil than on any of the other Orangeburg soils in the county, and infiltration is slower in cultivated areas. Generally, however, there is ample water available for plants. Organic matter is low in cultivated fields.

This soil occurs in small areas. Much of it is in woods, but a considerable part is in pasture and hay. A severe erosion hazard greatly limits the use of this soil for row crops. This soil is suitable for pasture, hay, and trees. (Capability unit IVe-1; woodland suitability group 3)

Plummer Series

Soils of the Plummer series are low lying, wet, and poorly drained. They have a dark-gray to black, loamy sand surface layer and a gray, sandy subsoil. These soils have developed in beds of sand and loamy sand on the uplands of the Coastal Plain and in depressions at the head of and along drainageways. In some places they are in seepage areas on hillsides. The Plummer soils are medium acid, are low in fertility, and have a high organic-matter content in the surface layer. Slopes range from 0 to 2 percent.

These soils adjoin the Lynchburg, Rains, Coxville, and Portsmouth soils and in some ways resemble them. They are more poorly drained and coarser textured than the Lynchburg soils and are below them on the slopes. In contrast with the light yellowish-brown subsoil of the Lynchburg soils, the subsoil in the Plummer soils is gray directly beneath the surface layer. Plummer soils are much coarser textured than the Rains and Coxville soils, but they are similar to them in drainage. Color in the surface layer is also similar, but the subsoil is generally a lighter gray. Plummer soils are better drained than the Portsmouth soils, are coarser textured, and lack their thick, black surface layer. In places the Plummer soils adjoin the Lakeland and Killian soils, but they are lower on the slopes than those soils and are much darker gray in the surface layer.

In this county the Plummer soils are intermingled with the Rutlege soils and are mapped with them in small areas. The profiles of these soils vary more than normal, especially in the thickness and color of the surface layer. The soils have similar qualities and crop limitations. They occupy small areas and are not important agriculturally. The Rutlege series is described later in this report.

Plummer-Rutlege loamy fine sands (Pr).--These soils are in low areas and are poorly drained.

Profile description:

0 to 6 inches, black, loose loamy fine sand.
6 to 14 inches, very dark gray, loose loamy fine sand.
14 to 32 inches, gray, loose sand with dark-brown, compact layers.

Variations in these soils occur within small areas. The texture of the profile ranges from loamy fine sand to loamy sand or sand. The surface layer ranges from black to dark gray or gray in color and from 5 to 18 inches in thickness. The dark-brown, compact layers do not occur in all places.

In these soils the water table is high, runoff is slow, and permeability is rapid. The chief hazard to use is excess ground water that, together with low natural fertility, limits the potential for crops or pasture. Drainage is difficult and generally is not practical because the sandy ditchbanks tend to cave in. The soils are strongly acid, and the surface layer is high in organic matter, which has accumulated in the wet areas.

These soils occur in small areas throughout the county. Their native vegetation was water oak, blackgum, pond pine, canes, and gallberry bushes, and most of the acreage remains in similar vegetation. The soils are better suited to trees than to pasture. They are not suited to crops. In places good sites for ponds are available. (Capability unit Vw-2; woodland suitability group 12)

Portsmouth Series

In the Portsmouth series are very poorly drained soils that have a thick, black surface layer and a gray subsoil. In many places they occupy small, rounded depressions. These soils have developed in beds of sandy loam and sandy clay sediments of the middle and lower Coastal Plain. They are very strongly acid, are medium in fertility, and have a high content of organic matter in the surface layer. Slopes range from 0 to 1 percent.

The Portsmouth soils adjoin the Rains, Plummer, Coxville, and Lynchburg soils and in some ways resemble them. They are more poorly drained than those soils, however, have a thicker, black surface layer, and are in lower positions. The Portsmouth soils are finer textured than the Plummer soils. In some places they adjoin the well-drained Norfolk and the excessively drained Lakeland soils but are lower on the landscape.

In this county the Portsmouth soils occur in small areas. They are mainly in the southern part of the county, but a few scattered areas occur elsewhere. Their native vegetation was hardwoods and canes. Blackgum, sweetgum, poplar, and water oak were the main hardwoods. Drained areas of these soils have a thick root zone and medium available moisture capacity. The soils are medium in fertility and generally are in good tilth. They produce good yields of corn, vegetables, and other crops that require a good supply of available moisture.

Portsmouth loam (Pt).--This is a deep, very poorly drained soil in depressions of the Coastal Plain.

Profile description:

0 to 8 inches, black, friable loam.
8 to 14 inches, dark-gray, friable sandy loam.
14 to 30 inches, dark-gray or gray, friable sandy clay loam with a few yellowish-brown mottles.
30 to 48 inches, grayish-brown sandy clay loam.

The black surface layer of this soil ranges from 8 to 14 inches in thickness. The subsoil ranges from sandy loam to sandy clay. In some places the

yellowish-brown mottling is absent. Included with this soil are areas of Rains soils and of Local alluvial land that are too small to be mapped separately.

This soil has slow runoff. It may be ponded for long periods if it is not drained or if existing drainageways do not function. Permeability and infiltration are moderate. Although the available moisture capacity is medium, this soil can supply ample moisture to crops. The organic-matter content is high, and fertility is medium. Drained areas, however, respond well to fertilization. The soil is very strongly acid and should be tested to determine the amount of lime needed for the crop grown.

Excess water is the principal hazard in using this soil for crops. Adequate drainage can be provided by open ditches or tile. In many places small areas of this soil are worked along with the adjoining soils and are planted to the same crops as those soils. Practically all the crops grown in the county can be grown on this soil if it is drained. The principal crops are cotton, soybeans, small grains, corn, hay, pasture, and most truck crops. Because of the good available moisture capacity, corn, hay, pasture, and truck crops are especially well suited. Pine grows naturally in uncultivated areas if there are enough seeds. Loblolly pine and desirable hardwoods produce good yields. Sites suitable for dug ponds occur in many places. (Capability unit IIIw-4; woodland suitability group 11)

Rains Series

The soils of the Rains series are poorly drained, nearly level, and low lying. They have a dark-gray, sandy loam surface layer and a gray, sandy clay loam subsoil. These soils have developed in beds of sandy loam to sandy clay loam of the uplands on the middle and lower Coastal Plain. They are strongly acid and low in fertility. Slopes range from 0 to 2 percent.

The Rains soils adjoin the Lynchburg, Portsmouth, Coxville, Grady, and Plummer soils and in some ways resemble them. They are lower and more poorly drained than the Lynchburg soils, and they are grayer in the subsoil and lack the uniform yellowish brown in the upper subsoil. Rains soils are better drained than the very poorly drained Portsmouth soils and have a thinner surface layer that is dark gray instead of black. They are coarser textured in the subsoil than the Coxville and Grady soils and are finer textured than the Plummer soils.

Most of the acreage of Rains soils in this county is in low areas south of Cameron and Creston, but many small areas occur elsewhere throughout the county. The native vegetation was blackgum, sweetgum, water oak, and some loblolly and pond pines. These kinds of trees still grow on much of the acreage, but they have been cut over. Some of the acreage has been cleared, drained, and planted to pasture or crops. The productivity of these soils is limited by wetness and low fertility.

Rains sandy loam (Ra).--This is a moderately deep to deep, poorly drained soil.

Profile description:

0 to 6 inches, very dark gray sandy loam.
6 to 13 inches, gray, friable sandy loam.
13 to 30 inches, gray, friable sandy clay loam with many yellowish-brown mottles.

The thickness of the very dark gray, sandy loam surface layer ranges from 4 to 8 inches. The subsoil ranges from 15 to 30 inches in thickness and from sandy loam to sandy clay loam in texture. The yellowish-brown mottling varies in amount and intensity. Included with this soil are small areas of the Plummer, Lynchburg, and Portsmouth soils that are too small to be mapped separately.

Runoff on Rains sandy loam is very slow, and excess water is the chief hazard. Permeability is moderately slow, and the available moisture capacity is medium. The soil is strongly acid and is low in fertility and in organic matter. Drainage is difficult because suitable outlets for ditches are lacking or are too distant. The cost of clearing this soil for pasture is generally high. Those areas that have been cleared are generally in carpetgrass. Dallisgrass and bahiagrass can be grown in adequately drained areas. The soil has a small total acreage and occurs in small areas. It is best suited to trees. (Capability unit IVw-3; woodland suitability group 7)

Ruston Series

The soils of the Ruston series are well drained and, in most places, have a grayish-brown, loamy sand surface layer and a yellowish-red, friable, sandy clay loam subsoil. These soils have developed in beds of unconsolidated sandy loam and sandy clay loam of the upper Coastal Plain. They are medium to high in fertility and medium acid. Slopes range from 0 to 15 percent.

The Ruston soils commonly adjoin the Orangeburg, Norfolk, Faceville, Magnolia, and Caroline soils and in some ways resemble them. Their texture is similar to that of the Orangeburg and Norfolk soils, but their subsoil is brown instead of red and yellow. The Ruston soils are similar to the Faceville soils in color but are coarser textured in the subsoil. Ruston soils are coarser textured and have a browner subsoil than the Magnolia soils. Compared with the Caroline soils, the Ruston soils are similar in color but are coarser textured, more friable, and lack the noticeably blocky structure of those soils.

The Ruston soils are extensive throughout the county. Their native vegetation was mixed stands of pines and hardwoods. Most of the acreage is now cultivated. These soils are generally in good tilth; have a thick root zone; and except where the surface layer is thick, have a good available moisture capacity. The less sloping areas are suited to many kinds of locally grown crops.

Ruston soils are mapped with Faceville soils in undifferentiated soil groups and also in separate units. The Ruston soils that are mapped with the Faceville soils have a thinner surface layer than those mapped separately.

Profile of a Ruston soil with a loamy sand surface layer:

0 to 8 inches, dark grayish-brown, loose loamy sand.
8 to 13 inches, yellowish-brown, loose loamy sand.
13 to 46 inches, yellowish-red, friable and crumbly sandy clay loam.

The thickness of the loamy sand surface layer ranges from 10 to 18 inches. In some places the subsoil is sandy loam, and in many places it is red instead of yellowish red.

Ruston soils of the kind just described have a thick, permeable root zone, are easily tilled, and can be worked within a wide range of moisture content. Infiltration is moderately rapid, and the available moisture capacity is moderate. Runoff causes a slight to moderate erosion hazard, and there is some soil blowing early in spring in areas that are exposed, dry, and freshly plowed. The soils have a medium amount of organic matter, are medium to high in fertility, and are medium acid. They respond to good management that includes adequate fertilization, and they are suited to most of the commonly grown crops.

Ruston loamy sand, thick surface, 0 to 2 percent slopes (RuA).--The surface layer of this soil is thicker and generally lighter colored than that of the Ruston loamy sand described for the series. Generally, it is 20 inches in thickness but ranges from 18 to 30 inches. In many places the subsoil is sandy loam. In some places it grades toward the red color of the Norfolk soils. Included with this soil in areas too small to be mapped separately are small areas of Norfolk loamy sand, thick surface; Ruston loamy sand; and Eustis loamy sand.

This soil has moderately rapid permeability and infiltration, and though runoff is slow, water does not remain on the surface. Erosion is only a slight hazard. Because of the moderately rapid permeability of the thick loamy sand surface layer, the root zone has low available moisture capacity and cannot supply enough moisture to shallow-rooted annuals or seedlings during dry periods. Consequently, this soil is often slightly droughty. It is low in organic matter and natural plant nutrients, but it responds well to fertilization and management. It is generally in good tilth and is well suited to mechanized farming. The total acreage of this soil is small, but individual areas are frequently large. The crops most commonly grown are cotton, soybeans, small grains, and corn. Crops grown for pasture are sericea lespedeza, Coastal bermudagrass, and bahiagrass.

This soil can be cultivated intensively. Such practices as plowing under cover crops and crop residue build up organic matter and increase the available moisture capacity. Heavy fertilization increases crop residue as well as crop yields and thus indirectly increases the organic matter. (Capability unit IIs-1; woodland suitability group 4)

Ruston loamy sand, thick surface, 2 to 6 percent slopes (RuB).--This soil differs from the Ruston loamy sand described for the series in the same ways as does Ruston loamy sand, thick surface, 0 to 2 percent slopes. It is more sloping than the Ruston loamy sand described for the series and has greater runoff and a slight erosion hazard. The erosion hazard, however, is not so serious as the drought hazard. Soil blowing occurs when conditions are favorable. (Capability unit IIs-1; woodland suitability group 4)

Ruston loamy sand, thick surface, 6 to 10 percent slopes (RuC).--This soil differs from the Ruston loamy sand described for the series in the same ways as does Ruston loamy sand, thick surface, 0 to 2 percent slopes. In addition, it is more sloping and its medium runoff causes a moderate erosion hazard. Practices needed to reduce these hazards are tilling on the contour, disposing of water by vegetated waterways, increasing organic matter, and growing more close-growing crops in the cropping system. (Capability unit IIIe-5; woodland suitability group 4)

Ruston loamy sand, thick surface, 10 to 15 percent slopes (RuD).--This soil differs from the Ruston loamy sand described for the series in the same ways as does Ruston loamy sand, thick surface, 0 to 2 percent slopes. Because it is more strongly sloping than that soil, runoff is medium to rapid and causes a more serious erosion hazard in cultivated areas. The small total acreage of this soil is mostly in narrow strips on short slopes along drainageways. Most of it is wooded. It is, however, suited to permanent pasture if grazing is restricted. It is not suited to cultivation. (Capability unit IVe-5; woodland suitability group 4)

Rutlege Series

Soils of the Rutlege series are nearly level and very poorly drained. They are sand or loamy sand throughout and have a very dark gray to black surface layer that ranges from 8 to 24 inches in thickness. Their subsoil is predominantly gray. These soils have developed in beds of sand or loamy sand of the Coastal Plain. They are ponded or have very slow runoff, are very rapidly permeable, and are strongly acid. Slopes range from 0 to 2 percent.

The Rutlege soils in this county are not important agriculturally. The native vegetation was mixed stands of pines and hardwoods with an undergrowth of briers and coarse grasses. The soils are mainly in trees, but a few areas have been drained and are in pasture, hay, small grains, and truck crops.

In this county the Rutlege soils are intermingled with the Plummer soils. In these places the two soils are mapped as a single unit. The soils are similar in characteristics and in limitations to use. Plummer soils have been described earlier in the report.

Sandy and Clayey Land

Sandy and clayey land has variable soil characteristics. It has a weakly developed profile that is somewhat similar to the profile of the Eustis, Lakeland, Orangeburg, Ruston, Magnolia, Vaucluse, and Caroline soils but that generally is not within the modal concept of the profile of those soils. The

colors are darker or lighter. In addition, the horizons are discontinuous and the solum is thin. In many places colluvial material of varying thickness covers the land. Sandy and clayey land has developed in Coastal Plain sediments consisting of sand, sandy loam, sandy clay, and clay and of soft shale, or fuller's earth. These sediments crop out on the steep escarpment faces of old marine formations that have been exposed by erosive streams. Coastal Plain sediments also crop out in road cuts (fig. 17).

Areas of this land roughly parallel the Congaree River, are on the south side of Big Beaver Creek and other large creeks that drain into the Congaree River, and border the small tributaries that have eroded into the plain.

The native vegetation on this land was mixed stands of pines and hardwoods. The hardwoods dominated in the stands and were mainly white oak, post oak, red oak, water oak, hickory, poplar, blackgum, and sweetgum. At present, practically all of the acreage is in cutover stands of these trees. Although yields are variable, trees grow well because their roots reach a good supply of available moisture.

In this county Sandy and clayey land is mapped in a sloping unit and a moderately steep unit.

Sandy and clayey land, sloping (SaD).--This land has slopes that range from 10 to 15 percent. About 5,485 acres occurs in the county, and practically all of it is in cutover woodland. Pines grow where the land has been cleared and abandoned. This soil is best suited as woodland. (Capability unit VIIe-2; woodland suitability group 14)

Sandy and clayey land, moderately steep (SaE).--This land is on slopes of 15 to 25 percent and more. Its total acreage of about 11,776 acres is cutover woodland. The land is not suited to cultivation or pasture; it is best suited as woodland. (Capability unit VIIe-2; woodland suitability group 14)

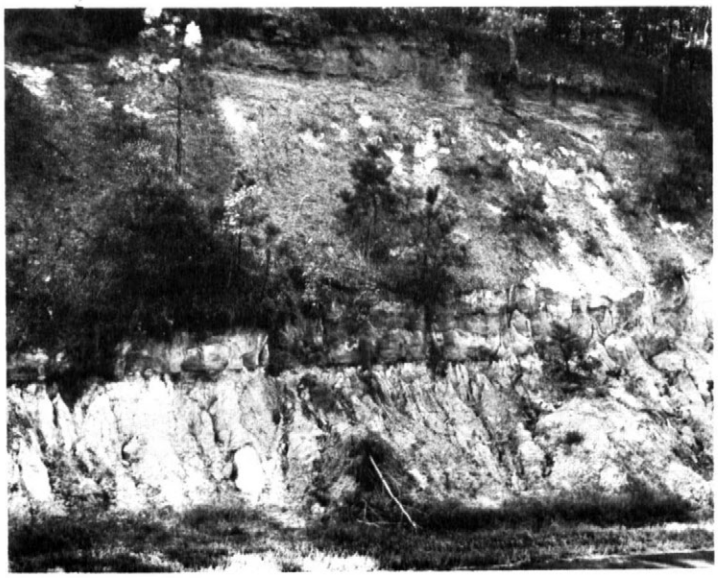

Figure 17.--Road cut showing outcroppings of Coastal Plain sediments.

Swamp

Swamp is very poorly drained and is covered with water 9 to 12 months of the year.

Swamp (Sw).--This land type consists of mixed alluvial and colluvial sediments along the streams and rivers in the county. These sediments vary in texture. They are generally sand or loamy sand in areas where the materials washed from the Coastal Plain. Along the Congaree River, Swamp is generally dark-gray silt loam or silty clay and is made up of alluvial material that washed from soils of the Piedmont Plateau and the Blue Ridge Mountains. The surface layer of this land is generally black and, to a depth of 8 to 18 inches, contains a large amount of decaying organic matter and a mat of fibrous roots. Beneath this layer is dark-gray or gray, loose sand to sandy loam that ranges from 3 to 10 feet or more in depth. Slopes range from 0 to 1 percent.

This land is in cutover hardwoods with an understory of water-tolerant shrubs, canes, and rushes (fig. 18). The hardwoods are mainly blackgum, sweetgum, maple, poplar, and water-tolerant oak. Many areas of this land are good sites for ponds, and ponds have been built in many places. Swamp is best used for ponds and for the production of hardwoods. If it is used for pasture, intensive ditching and diking are needed to remove the large amount of excess water that accumulates from the uplands nearby. (Capability unit VIIw-1; woodland suitability group 14)

Tifton Series

The soils of the Tifton series are deep and well drained and have a dark-gray, loamy sand surface layer and a yellowish-brown, sandy clay loam subsoil. They have developed in beds of sandy clay and clay of the upper Coastal Plain. The soils are high in fertility and are strongly acid. Slopes range from 0 to 6 percent.

Figure 18.--Typical vegetation in areas of Swamp.

The Tifton soils are near the Norfolk, Magnolia, Ruston, and Faceville soils and in some ways resemble them. They are similar to the Norfolk soils in the color of the surface layer and the subsoil, but they are finer textured in the subsoil and have a considerable amount of pebbles and rounded concretions of iron throughout the profile. The subsoil of the Tifton soils is finer textured than that of the Ruston soils and is yellowish brown instead of yellowish red. The Tifton soils are similar to the Faceville and Magnolia soils in the texture of the subsoil, but unlike those soils, they are yellowish brown in the subsoil instead of yellowish red and red.

The Tifton soils occur in the northwestern part of the county, principally near Staley Crossroads. Their native vegetation was mixed stands of pines and hardwoods, but the small total acreage is now in cultivation. Because these soils have a thick root zone, are generally in good tilth, and can supply ample moisture to plants, they are suited to a wide range of crops and are productive.

Tifton sandy loam, 2 to 6 percent slopes (TfB).--This soil is deep, well drained, and friable.

Profile description:

0 to 10 inches, very dark gray sandy loam containing pieces of fine gravel and iron concretions.
10 to 22 inches, yellowish-brown, friable but slightly stick sandy clay loam containing pebbles and iron concretions.
22 to 39 inches, yellowish-brown, friable to slightly firm sandy clay mottled with red and yellow; contains pebbles and iron concretions.

The thickness of the surface layer ranges from 10 to 12 inches, and the amount of gravel and small concretions of iron varies from place to place. The depth to mottling ranges from 24 to 36 inches. Included with this soil are a few areas of Norfolk loamy sand, thin solum, 2 to 6 percent slopes, that are too small to map separately.

This soil has a thick, fine-textured but moderately permeable root zone, which has medium available moisture capacity. The infiltration rate is moderate, and surface runoff is medium. The soil, therefore, can supply ample moisture for plants. It has medium organic-matter content, is high in natural fertility, and responds well to heavy fertilization and good management. The soil is generally in good tilth and can be worked within a reasonably wide range of moisture content. The erosion hazard on this soil is slight to moderate, but because of the smooth, gentle slopes, erosion can be controlled by providing contour cultivation, terracing, and stripcropping, and by maintaining vegetated waterways.

The small total acreage of this soil occurs in large areas and is cultivated. The principal crops are cotton, soybeans, corn, and small grains. (Capability unit IIe-2; woodland suitability group 3)

Vaucluse Series

Soils of the Vaucluse series are moderately deep and have a firm, compact subsoil. They are well drained and, in most places, have a dark-gray, loamy sand surface layer and a yellowish-red, sandy clay loam subsoil. These soils have developed in beds of unconsolidated sand and clay of the upper and middle Coastal Plain. They are strongly acid and low in fertility. Slopes range from 2 to 20 percent.

The Vaucluse soils commonly adjoin the Ruston, Norfolk, and Killian soils and in some ways resemble them. Although they are similar to the Ruston soils in color, they are much firmer, are more compact, and in many places are finer textured in the subsoil. The Vaucluse soils have a yellowish-red subsoil, in contrast to the yellowish-brown subsoil of the Norfolk soils. Although they are somewhat similar to the Killian soils in texture, their subsoil is yellowish red instead of pale yellow.

The Vaucluse soils occur throughout the county, but the largest areas are in the Sandhills in the northwestern part. The native vegetation was longleaf pine, blackjack oak, and post oak with an understory of huckleberry. Most of the acreage of these soils is cutover woodland, but a few small areas on mild slopes are cultivated. Productivity is limited, however, by a slowly permeable root zone that is only moderately thick and has a low available moisture capacity.

Vaucluse loamy sand, 2 to 6 percent slopes (VaB).--This is a firm, compact soil.

Profile description:

0 to 12 inches, dark-brown, loose loamy sand.
12 to 19 inches, yellowish-red, firm sandy clay loam.
19 to 26 inches, yellowish-red, very firm sandy clay mottled with reddish yellow and brownish yellow.
26 to 48 inches, light-red sandy clay loam with many yellow mottles.

The surface layer ranges from 5 to 18 inches in thickness, and in some places where it is more than 12 inches thick, it is sand instead of loamy sand. In color the surface layer ranges from dark brown to dark gray. The subsoil ranges from 4 to 20 inches in thickness. It is yellowish brown in a few places too small to be mapped separately. In the Sandhills where this soil adjoins the Lakeland or Eustis soils, the subsoil is coarser textured than normal and ranges from loamy sand to sandy loam. In these places the subsoil varies in the degree of firmness and appears to be weakly cemented. Included with this soil in a few places that are too small to be mapped separately are small areas of Norfolk, Ruston, Faceville, Eustis, Lakeland, and Killian soils.

This soil is low in natural fertility and plant nutrients and is strongly acid. Medium to rapid runoff causes a moderate erosion hazard. The amount of runoff varies with the thickness of the loamy sand surface layer and the degree of firmness in the subsoil. The subsoil is generally slowly permeable and absorbs water slowly. Thus, the available moisture capacity is low, and the soil cannot supply sufficient moisture for plants during dry spells.

Generally, this soil is not well suited to intensive management and to heavy fertilization. Some of the acreage is in cultivated crops, and some is wooded. Cultivated areas are commonly planted to all the locally grown crops but produce fairly low yields. Deep-rooted crops are not well suited, nor are corn, oats, soybeans, and other crops that require a large amount of moisture. Cotton, bahiagrass, and bermudagrass are suited. Trees grow slowly on this soil and, because they are poorly rooted, are damaged by windthrow. (Capability unit IIe-4; woodland suitability group 6)

Vaucluse loamy sand, 2 to 6 percent slopes, eroded (VaB2).--The surface layer of this soil is thinner and generally more variable in thickness than that of Vaucluse loamy sand, 2 to 6 percent slopes. It is 3 to 5 inches thick. In many places the plow layer extends into the yellowish-red, sandy clay loam subsoil, and in small included areas the subsoil is exposed. Organic matter and natural fertility are lower in this eroded soil than in the noneroded one, infiltration is slower, and surface runoff is more rapid. Also, the erosion hazard is somewhat greater and more intensive control practices are needed. In one such practice, close-growing crops are kept on the soil two-thirds of the time. Because of erosion, the slopes are not so smooth as on the uneroded soil and contour tillage is more difficult.

This eroded soil occurs mostly in small areas throughout the county and is planted to the same kinds of crops as Vaucluse loamy sand, 2 to 6 percent slopes. (Capability unit IIIe-4; woodland suitability group 6)

Vaucluse loamy sand, 6 to 10 percent slopes (VaC).--This soil is more sloping than Vaucluse loamy sand, 2 to 6 percent slopes, but is similar to that soil in other respects. Runoff and the resulting erosion hazard are greater, however, and are somewhat harder to control. Contour tillage is slightly more difficult because of the greater slopes.

This soil, which has a large total acreage, occurs in large and small areas throughout the northern and central parts of the county. (Capability unit IIIe-4; woodland suitability group 6)

Vaucluse loamy sand, 6 to 10 percent slopes, eroded (VaC2).--Because this soil is more sloping and more eroded than Vaucluse loamy sand, 2 to 6 percent slopes, its surface layer is thinner and more variable. It ranges from 3 to 5 inches in thickness. In a few included areas the yellowish-red subsoil is exposed. This sloping soil has more rapid runoff and less infiltration than the gently sloping soil and is more susceptible to severe erosion. Because of erosion the slopes are not smooth and good contoured fields, especially those on terraces, are hard to establish and maintain. Fertility and organic matter are low.

Although the total acreage is large, this soil generally occurs in small areas. Many of these are narrow areas on short slopes along drainageways and are not suited to stripcropping and other practices. The soil is best suited to sericea lespedeza, bahiagrass, bermudagrass, or other permanent forage plants. (Capability unit IVe-4; woodland suitability group 6)

Vaucluse loamy sand, 10 to 15 percent slopes (VaD).--This soil is strongly sloping, but in most other characteristics it is similar to Vaucluse loamy sand, 2 to 6 percent slopes. In many places, however, the subsoil is only 4 to 5 inches thick. Because runoff is rapid to very rapid, the erosion hazard is severe and little water is retained in the subsoil. Tilling on the contour and rotating of crops are difficult because slopes are short and abrupt.

Most of the acreage of this soil is woodland. The soil is best suited to trees and to other permanent plants such as bahiagrass, Coastal bermudagrass, or sericea lespedeza. (Capability unit IVe-4; woodland suitability group 6)

Vaucluse loamy sand, 10 to 15 percent slopes, eroded (VaD2).--Although this soil is more strongly sloping and more eroded than Vaucluse loamy sand, 2 to 6 percent slopes, it is similar to that soil in most other characteristics. In many places, however, the subsoil is thinner in the steeper soil. The surface layer is also thinner; it ranges from 3 to 5 inches in thickness. Included with the soil in some places are areas where the yellowish-red subsoil is exposed. Fertility and the organic-matter content are lower. Very rapid runoff contributes to the lower available moisture capacity of this soil.

Most areas of this soil have been abandoned and have reverted to pine and low-grade oak. Pasture on this soil is suitable for only limited grazing. (Capability unit VIe-2; woodland suitability group 6)

Vaucluse loamy sand, 15 to 20 percent slopes, eroded (VaE2).--The surface layer of this steep, eroded soil ranges from 3 to 5 inches in thickness, and in some places the yellowish-red subsoil is exposed. The subsoil is thinner in some places than that of Vaucluse loamy sand, 2 to 6 percent slopes. It ranges from 4 to 12 inches in thickness. Surface runoff is very rapid, and the erosion hazard is severe if this soil is cultivated.

Most of the acreage of this soil is cutover woodland and is best suited as woodland. If used for hay and grazing, the yields are low. This soil occurs in large and small areas, which are generally long, narrow breaks along the drainageways. (Capability unit VIe-2; woodland suitability group 6)

Vaucluse loamy sand, thick surface, 2 to 6 percent slopes (VtB).--This soil is thicker in the surface layer than Vaucluse loamy sand, 2 to 6 percent slopes. The surface layer ranges from 18 to 30 inches in thickness and, in a few places, is sand instead of loamy sand. In many places the subsoil is coarser textured than normal and is firm to very firm loamy sand or sandy loam. The thicker surface layer allows more water to infiltrate, but because of its coarse texture, it has a low available moisture capacity and the excess water is not readily taken into the slowly permeable subsoil. In many places this soil is not so droughty as Vaucluse loamy sand, 2 to 6 percent slopes, and can supply slightly more moisture, especially for established plants. In areas where this thick-surfaced soil adjoins Lakeland sand, the effect of the greater available moisture is noticeable in the natural reseeding of pine. This soil occurs in large and small areas and is mostly in the Sandhills of

the county. Yields are generally low on this soil, which is not suited to intensive cultivation. (Capability unit IIe-4; woodland suitability group 6)

Vaucluse loamy sand, thick surface, 6 to 10 percent slopes (VtC).--This soil differs from Vaucluse loamy sand, 2 to 6 percent slopes, in the same ways as does Vaucluse loamy sand, thick surface, 2 to 6 percent slopes. Because this soil is more sloping, however, it has a slight to moderate susceptibility to erosion.

This soil is suited to the same crops as the less sloping Vaucluse soils but produces somewhat lower yields. Trees are not so subject to windthrow. The soil occurs in large and small areas and has a larger total acreage than any other Vaucluse soil in the county. (Capability unit IIIe-4; woodland suitability group 6)

Vaucluse loamy sand, thick surface, 10 to 15 percent slopes (VtD).--This soil differs from Vaucluse loamy sand, 2 to 6 percent slopes, in the same ways as does Vaucluse loamy sand, thick surface, 2 to 6 percent. It is more strongly sloping, however, and has more rapid runoff. Much of the rainfall is lost by seeping between the surface layer and the firm subsoil. This soil is more droughty than the less sloping soil and is lower in fertility and organic matter. It is moderately susceptible to erosion. This soil occurs as breaks along drainageways and is mainly on short slopes. Windthrow is not serious. This soil has a large total acreage and is mostly in cutover woodland. (Capability unit IVe-4; woodland suitability group 6)

Wehadkee Series

The soils of the Wehadkee series are poorly drained. In most places they have a dark yellowish-brown surface layer and a grayish-brown, mottled subsoil. These soils have developed in fine-textured sediments that were deposited by stream overflow on the first bottoms along the Congaree River. These sediments were derived from materials washed from the soils of the Piedmont Plateau and the Blue Ridge Mountains. The soils are generally silt loam or silty clay loam and are strongly acid. Slopes range from 0 to 2 percent.

The Wehadkee soils adjoin the well-drained Congaree soils and the somewhat poorly drained Chewacla soils and are similar to them in texture. They are mottled with gray at a depth of 6 to 12 inches and are lower on the landscape than the Congaree and Chewacla soils.

In this county the Wehadkee soils are extensive along the Congaree River. They have a shallow root zone because the water table is frequently at the surface. The native vegetation was water-tolerant hardwoods, mainly blackgum, sweetgum, maple, ash, poplar, water oak, and cypress, and the soils support cutover stands of these trees.

The Wehadkee soils are not mapped separately in Calhoun County but are mapped with the Chewacla soils.

Profile of a Wehadkee soil with a silt loam surface layer. This is a poorly drained soil in alluvium.

0 to 7 inches, dark yellowish-brown, friable silt loam.
7 to 24 inches, dark-gray silty clay loam mottled with dark grayish brown to grayish brown; firm and slightly plastic.
24 to 40 inches, mottled gray, dark-gray, and yellowish-brown silty clay; firm and plastic.

The surface layer ranges from 6 to 12 inches in thickness and is uniform in color. Texture throughout the profile ranges from silt loam to silty clay loam.

Wehadkee and Chewacla silt loams (Wc).--These soils are mapped together as a unit because they occur together closely or are intricately mixed. They frequently lack distinct boundaries, and they are suited to the same uses and require the same management. About half of the acreage is in Wehadkee soils, and half is in Chewacla soils. These soils have similar color and texture in the surface layer and similar color in the subsoil. Their surface layer is uniformly brown and ranges from 6 to 24 inches in thickness. Included with the soils are a few areas of the Congaree soils and of Swamp that are too small to be mapped separately. These soils are used mainly for hardwoods.

These soils have a high available moisture capacity, but they require drainage that regulates the seasonal fluctuations of the water table and removes surface water if they are farmed. The somewhat poorly drained Chewacla soil is subject to occasional flooding, and the poorly drained Wehadkee soil, to frequent flooding. If drained, the Chewacla soil can produce corn, small grains, hay, and pasture; the Wehadkee soil can produce hay and pasture. Sites for hardwoods and loblolly pine can also be improved by drainage. Neither soil can be worked or grazed when wet without injuring plants. In places where suitable outlets are not nearby, drainage is expensive and difficult. In some places dikes are needed to prevent flooding.

Wehadkee and Chewacla silt loams are high to medium in fertility and are high in organic-matter content. They are medium acid to strongly acid. Future development of these soils is feasible for crops, pasture, and increased timber production. (Capability unit IVw-1; woodland suitability group 10)

Formation and Classification of Soils

This section discusses the factors that have affected the formation and composition of the soils in Calhoun County and the classification of the soils by higher categories.

Formation of Soils

Soil is formed by complex processes that act upon parent material. These processes, interacting slowly but constantly, bring about changes in the parent material and form soil. The soil itself is a complex substance; it, too, is constantly changing and never reaches a static condition. It passes slowly through stages of youth, maturity, and even old age. Thus, the character of a soil depends upon

the intensity of the soil-forming processes, the length of time during which the various processes have acted, and the resistance of the parent material to change.

At any stage of its history, a soil may be affected by mechanical processes. For example, the surface layer may be wholly or partly removed by erosion and the material beneath exposed. Then, the soil-forming processes begin working on the exposed material to form a new surface layer. Whether or not erosion benefits the growth of plants depends on the rate soil material is removed and on the supply of plant nutrients in the new surface layer. Normal erosion may benefit the soil. Accelerated erosion is caused by misuse of the land and is harmful.

The characteristics of the soil at any given point depend on (1) the physical and mineralogical composition of the parent material, (2) the climate, (3) the plant and animal life on and in the soil, (4) the relief, or lay of the land, and (5) the length of time the forces of soil development have acted on the soil material.

Climate and vegetation are the active forces of soil genesis. They change the parent material from an inert, heterogeneous mass to a natural body with genetically related horizons. The action of climate and vegetation on the parent material is aided or hindered in varying degree by relief, which, in turn, influences runoff, the movement of water through the soil, the natural erosion, and the native vegetation. The nature of the parent material affects the kind of profile that can be formed and, in extreme cases, may be the dominant factor. Throughout the genesis of soil, time brings about changes. The time needed for different horizons to form may be much or little, but some time is normally required. A long period is needed for the development of the soil into a body in equilibrium with its environment. The influence of climate on soil and plants depends not only on temperature, rainfall, and humidity but also on relief and the physical characteristics of the soil or soil material.

Factors of soil formation

PARENT MATERIAL

Calhoun County is in the middle and upper parts of the Atlantic Coastal Plain of central South Carolina. It is in the Red-Yellow Podzolic soil zone of the southeastern part of the United States (8). The soils have formed in sand and clay that were transported by the waters of the Atlantic Ocean and coastal streams and that were deposited in beds. The forests under which the soils formed were made up of pines and hardwoods.

Geologically, Calhoun County is in an area of Cretaceous and Tertiary marine formations (3). The Sandhills in the county are a part of the Tuscaloosa formation, and also include a narrow belt of the Black Mingo formation and part of the McBean formation, which extends to the central part of the county. The southern half of the county is mostly underlain by the Santee limestone formation. All these formations have been eroded, reworked, and dissected by drains.

In the southern third of the county, the old marine formations have been overlain by deposits of three marine terraces of the Pleistocene period. These terraces have not been eroded or dissected by streams. The three terrace deposits are the Brandywine, with a shoreline at an elevation of 270 feet; the Coharie, with a shoreline at an elevation of 215 feet, and the Sunderland, with a shoreline at an elevation of 170 feet. The sediments deposited by the ocean vary from sands to clays. The sands are principally quartz. They have resisted the forces of soil formation and have developed into Regosols. These soils lack textural B horizons, which are formed when silicate clays and other minerals break up and move downward. Soils formed in deposits that contain various proportions of sands and clays have both color and textural B horizons and are mature soils. In Calhoun County the Red-Yellow Podzolic soils were so formed.

Alluvial materials that consist of gravel, sand, silt, and clay have been deposited in the valleys of all the major streams and of some of their tributaries. These deposits are recent and show little evidence of soil development. Colluvial deposits, made up largely of sandy materials, occur along the upper drainageways of the uplands. Soils formed in the colluvial deposits are generally sandy and do not have developed horizons.

CLIMATE

Because the climate of Calhoun County is warm and the soil is moist, the chemical reactions in the soil are rapid much of the time. Because rainfall is in large amounts, water moving through the soil removes soluble materials or colloidal matter. Plant remains decompose rapidly in this climate and thus hasten the effects of organic acids on clay minerals and the removal of carbonates. Soil weathering is further hastened because the soil is not frozen for prolonged periods. Climate is uniform throughout the county and alone does not account for broad differences between the soils, but climate may account for the differences between the soils in Calhoun County and those elsewhere in the State. Further information about climate is given in the section "Additional Facts About the County."

LIVING ORGANISMS

Plants, micro-organisms, earthworms, and other forms of life that live on and in the soil are active in the soil-forming processes. The changes they bring about depend mainly on the kind of life processes peculiar to each. The kinds of plants and animals are determined by the climate, parent material, relief, age of the soil, and by other organisms.

Generally, the kind of soil in an area varies according to the kind of vegetation. In this county the soils have formed under (1) pine-hardwood forests, (2) cypress-swamp hardwood forests with some pond pine, and (3) a forest of southern white-cedar and swamp hardwoods with some cypress and pond pine.

The soils that formed under a pine-hardwood forest are the most extensive in this county. These soils are mineral. They have a light-colored surface layer, in which the content of organic matter is

about 1 to 3 percent. Mineral soils also formed under a cypress-swamp hardwood forest with some pond pine. These soils have a dark-gray to black surface layer that is 5 to 15 percent organic matter. Although the water table in these soils is at the surface part of the time, it recedes enough to permit partial oxidation of the organic matter.

In a few small, swampy areas organic soils have formed under a forest that was mostly southern white-cedar and swamp hardwoods but that contained some cypress and pond pine. The content of organic matter of these soils is between 30 and 80 percent. The soils have formed in areas where water stood on the surface or was near the surface most of the time.

RELIEF

Relief, by its control of natural drainage, is a modifying factor in soil formation. Thus, several different soils can form in similar parent material. Most of Calhoun County is a gently sloping plain, but the county ranges from nearly level to steep. Four kinds of landscape are in the county, and each affects the formation of the soils differently.

The Sandhills area is rolling and is deeply dissected by streams. In this area the soils are well drained. They are deep and sandy on ridges, but on side slopes adjacent to streams, many shallow phases of Lakeland sand and Eustis sand have developed. Geologic erosion has been more rapid on side slopes, but it has not taken away soil faster than it has formed.

Near the streams but outside the Sandhills are sloping, moderately dissected areas. In these areas the soils are mostly well drained and have a thick solum. Water percolates through the solum, and runoff is slow. Runoff is greater, however, on the steeper parts, and geologic erosion has kept pace with soil formation. Here the solum is thinner, and parent material is closer to the surface.

Between streams are broad, slightly dissected, flat areas. Most of the soils in these areas are low lying and have a high water table that fluctuates. These soils range from moderately well drained to very poorly drained. On the nearly level to gently sloping parts of this area, the Goldsboro soils have developed a yellow B horizon and Lynchburg soils have developed a gray surface layer and a distinctly mottled subsoil. In the depressions the Rains, Portsmouth, and other soils have a black surface layer and a gray subsoil.

In areas on valley floors, on stream bottoms, and in colluvium, the soils are young and are forming in colluvium. The genetic layers in these soils are poorly defined or are absent. The soils are well drained to poorly drained.

TIME

As time passes, soils change and develop distinct morphology. The effects of time are difficult to determine precisely because a long time is required for some soil properties to change appreciably. Because Calhoun County is warm and humid, less time is required for soils to form distinct horizons than is required in dry or cold areas. Also, less time is required for soils to form distinct horizons in moderately fine textured deposits than is required in sands or other coarse-textured deposits. Because sand resists the chemical forces of weathering, the development of the Lakeland and Eustis soils in the deposits of resistant sands is retarded.

The Killian soils are developing in kaolinitic clays, which are fairly inert chemically. These soils have not developed to the degree that might be expected of soils that have been subjected to soil-forming processes as long as these clays have.

The Congaree soils, other soils in alluvium, and Local alluvial land are young and show little if any degree of genetic development. They are developing in very recent deposits and in ones that are presently being deposited. Time accounts for the lack of development in these soils.

Generally, the rest of the soils in Calhoun County are mature and have well-developed, genetic horizons.

Classification of Soils

One of the main objectives of a soil survey is to describe and identify the soils and determine their relationship to agriculture. A second objective is to group the soils according to common characteristics. Such a grouping shows the relationship of the soils to one another and to soils of other areas. This grouping is necessary because there are so many different kinds of soils that it would be difficult to remember the characteristics of all of them. If the soils are placed in a few groups, each group having selected characteristics in common, their general nature can be remembered more easily.

The lower categories of classification--the soil type and soil series--are defined in the Glossary at the end of this report. The soil phase is a subdivision of one of the natural units of classification, in this report the soil type, and is also defined.

The highest category of classification is the soil order. The orders are made up of suborders, which, in turn, consist of great soil groups (15). In a county several soil series generally are in each great soil group. Table 9 shows the orders and great soil groups represented in Calhoun County. It lists the soil series in each great soil group and gives pertinent information about the soils. All three soil orders--the zonal, intrazonal, and azonal--are represented in this county.

The zonal order is made up of soils that have well-developed characteristics. In their formation these soils reflect the predominant influence of climate and living organisms. Zonal soils are considered normal because their profiles are essentially in equilibrium with the climate and other soil-forming factors in the area. In Calhoun County the zonal soils are members of the Red-Yellow Podzolic great soil group.

Intrazonal soils have more or less well-developed soil characteristics that reflect the dominant influence of a local factor of relief or parent material over the effects of climate and living organisms. In places these soils occur in association with zonal soils. Intrazonal soils in this county are

TABLE 9.--Characteristics and genetic relationships of soil series

ZONAL SOILS

Great soil group and soil series	Profile description 1/	Position	Soil drainage	Slope range	Parent material	Degree of profile development 2/
				Percent		
Red-Yellow Podzolic soils:						
Caroline--------	Dark grayish-brown to brown loamy sand over red sandy clay or clay, mottled with yellowish red to strong brown.	Uplands--	Good-------	2-25	Unconsolidated sandy clays and clays of the Atlantic Coastal Plain.	Strong.
Faceville-------	Dark grayish-brown to grayish-brown loamy fine sand over yellowish-red fine sandy clay or clay.	Uplands--	Good-------	0-10	Unconsolidated sandy clays and clays of the Atlantic Coastal Plain.	Strong.
Kalmia----------	Olive-brown loamy sand over olive-brown sandy loam.	Stream terraces.	Good-------	0-2	Alluvium of sandy loams and sandy clays washed from Coastal Plain material.	Moderate.
Marlboro--------	Very dark gray very fine sandy loam to fine sandy loam over strong-brown to yellowish-brown fine sandy clay loam or clay loam.	Uplands--	Good-------	0-6	Unconsolidated sandy clays and clays of the Atlantic Coastal Plain.	Strong.
Norfolk---------	Very dark gray very fine sandy loam to fine sandy loam over strong-brown to yellowish-brown fine sandy clay loam or clay loam.	Uplands--	Good-------	0-6	Unconsolidated sandy clays and clays of the Atlantic Coastal Plain.	Strong.
Ruston----------	Dark grayish-brown to brown loamy sand over yellowish-red sandy loam and sandy clay loam.	Uplands--	Good-------	0-15	Unconsolidated sandy loams and sandy clays of the Atlantic Coastal Plain.	Strong.
Tifton----------	Very dark gray to dark grayish-brown loamy sand over yellowish-brown sandy clay loam.	Uplands--	Good-------	2-6	Unconsolidated sandy clays of the Atlantic Coastal Plain.	Strong.
Vaucluse--------	Very dark gray to dark gray and grayish-brown loamy sand over yellowish-red sandy loam to sandy clay.	Uplands--	Good-------	2-20	Unconsolidated sandy loams to sandy clays of the Atlantic Coastal Plain.	Moderate.

TABLE 9.--Characteristics and genetic relationships of soil series--Continued

ZONAL SOILS--Continued

Great soil group and soil series	Profile description 1/	Position	Soil drainage	Slope range	Parent material	Degree of profile development 2/
				Percent		
Red-Yellow Podzolic soils (with some characteristics of Reddish-Brown Lateritic soils):						
Greenville------	Dark reddish-brown to reddish-brown sandy loam over dark-red sandy clay.	Uplands--	Good-------	0-10	Unconsolidated sandy clays of the Atlantic Coastal Plain.	Strong.
Magnolia--------	Reddish-brown sandy loam over red sandy clay loam to sandy clay.	Uplands--	Good-------	0-15	Unconsolidated sandy clays of the Atlantic Coastal Plain.	Strong.
Orangeburg------	Yellowish-brown to brown loamy sand over red to yellowish-red sandy loam or light sandy clay loam.	Uplands--	Good-------	0-15	Unconsolidated sandy loams and sandy clays of the Atlantic Coastal Plain.	Strong.
Red-Yellow Podzolic soils (with some characteristics of Low-Humic Gley soils):						
Dunbar----------	Dark-gray fine sandy loam over fine sandy clay loam that is yellowish brown and yellowish brown mottled with gray, brown, and red.	Uplands--	Moderately good to somewhat poor.	0-2	Unconsolidated sandy clays of the Atlantic Coastal Plain.	Moderate.
Goldsboro-------	Very dark brown loamy sand over yellowish-brown sandy loam to sandy clay loam mottled with strong brown and dark red.	Uplands--	Moderately good to somewhat poor.	0-2	Unconsolidated sandy loams of the Atlantic Coastal Plain.	Moderate.
Izagora---------	Very dark gray or gray sandy loam to loamy sand over grayish-brown, brown, or pale-yellow sandy clay or sandy clay loam mottled with red, yellowish red, and light olive brown.	Stream terraces.	Moderately good.	0-2	Alluvium of sandy clays washed from Coastal Plain material.	Moderate to weak.

TABLE 9.--Characteristics and genetic relationships of soil series--Continued

ZONAL SOILS--Continued

Great soil group and soil series	Profile description 1/	Position	Soil drainage	Slope range	Parent material	Degree of profile development 2/
				Percent		
Killian---------	Very dark gray to dark olive-gray loamy sand over pale-brown or pale-yellow to light-gray sandy clay to clay mottled with yellowish brown, reddish yellow, and reddish brown.	Uplands--	Moderately good to somewhat poor.	2-15	Unconsolidated sandy clays and clays of the Atlantic Coastal Plain; high kaolin content.	Moderate.
Lynchburg-------	Very dark grayish-brown sandy loam to loamy sand over sandy loam to sandy clay loam that is light brownish gray to light gray mottled with strong brown.	Uplands--	Somewhat poor.	0-2	Unconsolidated sandy loams and sandy clay loams of the Atlantic Coastal Plain.	Moderate.

INTRAZONAL SOILS

Low-Humic Gley soils:						
Coxville--------	Very dark gray sandy loam over gray to grayish-brown fine sandy clay loam to clay loam mottled with yellowish brown and red.	Uplands--	Poor-------	0-2	Unconsolidated sandy clays and clays of the Atlantic Coastal Plain.	Moderate.
Grady-----------	Very dark gray to black loam and sandy loam over gray to dark-gray sandy clay loam to heavy sandy clay that is mottled with yellowish brown and red.	Depressions on uplands.	Poor-------	0-2	Unconsolidated sandy clays and clays of the Atlantic Coastal Plain.	Moderate.
Myatt-----------	Dark-gray loamy sand over light-gray sandy loam to light sandy clay.	Stream terraces.	Poor-------	0-2	Alluvium of sands and sandy loams washed from soils on the Coastal Plain.	Weak.
Plummer---------	Black to very dark gray loamy fine sand or sand over gray sand and loamy sand.	Uplands--	Poor-------	0-2	Unconsolidated sands and loamy sands of the Atlantic Coastal Plain.	Weak.
Rains-----------	Very dark gray sandy loam over gray sandy loam to sandy clay loam.	Uplands--	Poor-------	0-2	Unconsolidated sandy loams to sandy clay loams of the Atlantic Coastal Plain.	Weak.

TABLE 9.--Characteristics and genetic relationships of soil series--Continued

INTRAZONAL SOILS--Continued

Great soil group and soil series	Profile description 1/	Position	Soil drainage	Slope range	Parent material	Degree of profile development 2/
				Percent		
Wehadkee--------	Dark yellowish-brown silt loam over grayish-brown silt loam or silty clay loam.	Flood plains.	Poor-------	0-2	Alluvium of silts and clays washed from Piedmont materials.	Weak.
Humic gley soils:						
Okenee----------	Black loam and sandy loam over dark-gray heavy sandy loam to light sandy clay loam.	Stream terraces.	Very poor--	0-2	Alluvium of sandy loams and sandy clays washed from Coastal Plain material.	Weak.
Portsmouth------	Black sandy loam and loam over dark-gray to gray sandy loam and sandy clay loam.	Depressions on uplands.	Very poor--	0-2	Unconsolidated sandy loams and sandy clays of the Atlantic Coastal Plain.	Weak.
Rutlege---------	Very dark gray to black sand or loamy sand over gray sand.	Uplands--	Very poor--	0-2	Unconsolidated sands or loamy sands of the Atlantic and Gulf Coastal Plains.	Weak.

AZONAL SOILS

Regosols:						
Eustis----------	Very dark brown to grayish-brown sand and loamy sand over yellowish-red to strong-brown sand or loamy sand.	Uplands--	Excessive--	0-15	Unconsolidated sands and loamy sands of the Atlantic Coastal Plain.	Weak.
Lakeland--------	Very dark gray and dark grayish-brown sand and loamy sand over strong-brown to yellowish-brown sand.	Uplands--	Excessive--	0-15	Unconsolidated sands of the Atlantic Coastal Plain.	Weak.
Alluvial soils:						
Chewacla--------	Dark-brown to very dark brown silt loam over dark yellowish-brown or brown silt loam to silty clay loam.	Flood plains.	Poor--------	0-2	Alluvium of silts and clays from Piedmont materials.	Weak.

TABLE 9.--Characteristics and genetic relationships of soil series--Continued

AZONAL SOILS--Continued

Great soil group and soil series	Profile description 1/	Position	Soil drainage	Slope range	Parent material	Degree of profile development 2/
				Percent		
Congaree--------	Dark-brown to brown silt loam over dark-brown to dark yellowish-brown silt loam to very fine sandy loam.	Flood plains.	Good-------	0-2	Alluvium of silts and clays from Piedmont materials.	Weak.

1/ These descriptions are of soil profiles not materially affected by accelerated erosion.

2/ Estimated according to the number of important genetic horizons and the degree of contrast between them.

members of the Low-Humic Gley and Humic Gley great soil groups.

The azonal order is made up of soils that, because of youth, resistant parent material, or relief, lack well-developed profiles. The azonal soils in this county belong to the Regosols and Alluvial soils great soil groups.

Many of the soil series in this county are not representative of the central concept of any great soil group but intergrade from one great soil group to another.

The classification of the soils in the county is based largely on characteristics observed in the field. It may be revised as knowledge about the soils increases.

Red-Yellow Podzolic soils

The Red-Yellow Podzolic great soil group is made up of well-drained, acid soils that have well-developed profiles. The soils have thin, organic (A0) and organic-mineral (A1) horizons that overlie a light-colored, bleached (A2) horizon. The A2 horizon overlies a more clayey, red, yellowish-red, or yellow B horizon. The parent material is more or less siliceous. Coarse, reticulate streaks or mottles of red, yellow, brown, and light gray occur in the deep horizons of the Red-Yellow Podzolic soils that are underlain by a thick layer of parent material.

In Calhoun County, the soils that most nearly fit the central concept of Red-Yellow Podzolic soils are of the Caroline, Faceville, Kalmia, Marlboro, Norfolk, Ruston, Tifton, and Vaucluse series. Greenville, Magnolia, and Orangeburg series are classified as Red-Yellow Podzolic soils, but they have some characteristics of Reddish-Brown Lateritic soils. Soils classified as Red-Yellow Podzolic soils that have some characteristics of Low-Humic Gley soils are of the Dunbar, Goldsboro, Izagora, Killian, and Lynchburg series.

The Red-Yellow Podzolic soils have formed under deciduous, coniferous, or mixed forests in a humid, warm-temperate climate. Under such conditions the decomposition of organic matter and the leaching of plant nutrients is rapid. Consequently, the soils are strongly acid or very strongly acid and are low in calcium, magnesium, and other bases. The clay fraction is commonly dominated by kaolinite. It generally contains moderate to large amounts of free iron oxides or hydroxides, or it may contain small amounts of aluminum. Hydrous mica, montmorillonite, or both, may form part of the clay fraction in some of the soils. The base-exchange capacity of these soils ranges from 8 to 20 milliequivalents (meq.) per 100 grams of soil. The base saturation is less than 35 percent, and it generally averages about 15 percent.

Differences in morphology among the Red-Yellow Podzolic soils in the county are largely, but not entirely, associated with the nature of the parent materials, especially with their texture. In cultivated areas the soil materials in the A0 and A1 horizons have been mixed so much that the horizons are no longer distinguishable. In areas of accelerated erosion much or all of the A horizon may have been removed. The horizon that has reticulate streaks or mottles may be absent in a few Red-Yellow Podzolic soils, especially in the more sandy ones.

Following are profile descriptions of soils representative of the Red-Yellow Podzolic soils in Calhoun County:

CAROLINE, FACEVILLE, RUSTON, AND VAUCLUSE SERIES

The soils in these series are good examples of Red-Yellow Podzolic soils. Their A horizons are similar, and their B horizons are thick, yellowish red to red, and have a weak to strong, subangular blocky structure. The Caroline soils are finer textured in the B and C horizons than are the Faceville, Ruston, and Vaucluse soils and have stronger blocky structure. The Vaucluse soils have a moderately thick B horizon, which is firm to very firm or slightly cemented.

Profile of Caroline loamy sand, 2 to 6 percent slopes (one-half mile northwest of intersection of U.S. Highways No. 601 and 176)--

Ap--0 to 6 inches, dark grayish-brown (2.5Y 4/2) loamy sand; weak, fine, crumb structure; very friable; many roots present; pH 5.8; abrupt, smooth boundary.

A2--6 to 13 inches, light yellowish-brown (10YR 6/4) loamy sand; weak, fine, crumb structure; very friable; pH 6.2; abrupt, smooth boundary.

B21--13 to 17 inches, mottled, red (2.5YR 4/8), yellowish-red (5YR 5/8), and strong-brown (7.5YR 5/8) sandy clay; mottles common, medium, and faint; moderate, fine and very fine, subangular blocky structure; friable; pH 5.1; clear, smooth boundary.

B22--17 to 28 inches, red (5YR 4/8) and reddish-yellow (7.5YR 6/8) clay; strong, fine, subangular blocky structure; firm; clay films on faces of peds and on coarse sand grains; pH 5.2; gradual, wavy boundary.

B3--28 to 38 inches, yellowish-red (5YR 4/8) sandy clay with many, coarse, distinct, red (10R 4/8) mottles and a few medium-yellow (10YR 7/6) mottles; strong to moderately fine, subangular blocky structure; firm; a few patchy clay skins on faces of larger peds; pH 5.0; gradual, wavy boundary.

C1--38 to 48 inches +, same color as B3 horizon; clay with lenses of sandy clay; weak, medium and moderate, subangular blocky structure to massive (structureless); friable to firm; clay films on some of the ped faces; pH 4.8.

The loamy sand surface layer ranges from 8 to 18 inches in thickness in the modal soil and from 18 to 30 inches in the thick-surface phases. According to the amount of organic matter, the Ap horizon ranges from dark grayish brown to grayish brown. The lower boundary of the A2 horizon is wavy in a large area. The subsoil ranges from red to yellowish red and yellowish brown. Mottling in the B21 horizon varies in intensity and in some places is absent. As this soil grades toward Ruston or Faceville soils, the subsoil ranges from clay to sandy clay and its structure becomes weaker. Where the subsoil is clay, the structure is stronger.

Profile of Faceville loamy fine sand, 2 to 6 percent slopes (just north of intersection of U.S. Highway No. 176 and State Route 20, locally called Bellville Road)--

Ap--0 to 7 inches; dark grayish-brown (10YR 4/2) loamy fine sand; weak, fine, crumb structure; very friable to loose; many fine roots and pores; pH 5.6; abrupt, smooth boundary.
A2--7 to 13 inches, pale-brown (10YR 6/3) loamy fine sand; weak, fine, granular structure; very friable; few quartz pebbles; pH 6.0; abrupt, smooth boundary.
B21--13 to 22 inches, yellowish-red (5YR 4/8) sandy clay; moderate, fine to very fine, subangular blocky structure; friable when moist and slightly sticky when wet; many fine roots and a few small, rounded pebbles; pH 5.4; clear, smooth boundary.
B22-22 to 30 inches, yellowish-red (5YR 4/8) sandy clay; moderate, medium, subangular blocky structure; friable; a few patchy clay films; pH 5.5; clear, smooth boundary.
B3--30 to 38 inches, yellowish-red (5YR 4/8) sandy clay with few, fine, strong-brown (7.5YR 5/8) mottles; moderate, medium, subangular blocky structure; friable; many continuous clay films on ped surfaces; pH 5.6.
C1--38 to 50 inches, yellowish-red (5YR 5/8) sandy clay mottled with red (2.5YR 4/8); massive (structureless); friable; few soft, dark-red concretions.

The surface layer ranges from loamy fine sand to loamy sand and, in a few places, is a sandy loam; it ranges from 6 to 12 inches in thickness. The Faceville soil just described grades toward the coarser textured Ruston soils and toward the finer textured, firmer Caroline soils.

Profile of a Ruston soil, on 0 to 2 percent slopes, that has a loamy sand surface layer (in Creston, just south of intersection of State Routes 6 and 33, on east side of Route 6)--

Ap--0 to 8 inches, dark grayish-brown (10YR 4/2) to brown (10YR 4/3) light loamy sand; weak, fine, crumb structure; very friable; many roots; pH 5.9; abrupt, smooth boundary.
A2--8 to 13 inches, yellowish-brown (10YR 5/4) loamy sand; weak, fine, crumb structure; very friable; pH 5.3; abrupt, smooth boundary.
B1--13 to 16 inches, yellowish-red (5YR 5/8) sandy clay loam; weak, fine, subangular blocky structure; very friable; many pores; pH 5.6; clear, smooth boundary.
B21--16 to 28 inches, yellowish-red (5YR 4/8) sandy clay loam; weak, fine, subangular blocky structure; friable; many pores; few coarse sand grains; pH 5.6; clear, smooth boundary.
B22--28 to 38 inches, yellowish-red (5YR 4/8) heavy sandy loam; weak, medium and coarse, subangular blocky structure; friable to very friable; many pores; gradual, smooth boundary.
B3--38 to 46 inches, yellowish-red (5YR 4/8) sandy clay loam; massive (structureless) and in places weak, coarse, subangular blocky structure; friable; gradual, smooth boundary.
C1--46 to 60 inches +, yellowish-red (5YR 5/8) sandy loam to sandy clay loam; massive (structureless); friable.

The surface layer ranges from gray to dark grayish brown or brown. It is ordinarily 10 to 18 inches thick but is 18 to 30 inches thick in the thick-surface phases. The subsoil ranges from sandy loam to sandy clay loam, and the C horizon, in places, is mottled with red, strong brown, and yellowish red.

Profile of Vaucluse loamy sand, 2 to 6 percent slopes (in woods on south side of State Route 6 and one-fourth mile west of its intersection with U.S. Highway No. 21)--

A1--0 to 5 inches, very dark gray (10YR 3/1) loamy sand; weak, medium, crumb structure; very friable; small quartz gravel and rounded concretions of iron on the surface; many matted roots; pH 5.8; clear, smooth boundary.
A2--5 to 8 inches, dark-brown (10YR 4/3) light loamy sand; weak, fine, crumb structure; very friable; small concretions of gravel and iron; many roots; pH 5.9; clear, wavy boundary.
A3--8 to 12 inches, yellowish-red (5YR 5/6) loamy sand; weak, medium and fine, crumb structure; slightly firm in place, loose when crushed; gravel and iron concretions; fewer roots than in horizons above; pH 5.3; clear, smooth boundary.
B21--12 to 19 inches, yellowish-red (5YR 5/6) sandy clay loam; moderate, fine, subangular blocky structure; firm in place, breaks to a friable mass; coarse grains of quartz sand and fine pebbles (5 to 6 millimeters in diameter); very few roots; pH 5.3; abrupt, smooth boundary.
B3--19 to 26 inches, yellowish-red (5YR 5/8) sandy clay with many, medium, and distinct mottles of reddish yellow (7.5YR 6/8) and brownish yellow (10YR 6/6); moderate, medium, subangular blocky structure; firm to very firm; coarse grains of sand; a few small, patchy films of clay on ped faces; pH 5.4; gradual boundary.
C1--26 to 48 inches +, light-red (2.5YR 6/6 and 6/8) sandy clay loam to sandy loam and few lenses of loamy sand; many, coarse, prominent, yellow (10YR 7/8) mottles; massive (structureless); firm when moist, very hard when dry, but breaks to friable mass; contains many coarse grains of quartz sand and a few fine, clear quartz pebbles; a few fine flakes of kaolin (5 millimeters in diameter) and balls of red clay.

The loamy sand surface layer ranges from 6 to 18 inches in thickness in a normal soil and from 18 to 30 inches in the thick-surface phases. The A1 horizon ranges from gray to dark gray, grayish brown, or olive brown. The subsoil is sandy clay loam to sandy clay and ranges from 8 to 30 inches in thickness. It is yellowish red to reddish yellow

in most places, but in a few places it is red or grades to strong brown (7.5YR). In some places, especially in the Sandhills, the subsoil is very firm or weakly cemented sandy loam.

KALMIA, MARLBORO, NORFOLK, AND TIFTON SERIES

The soils in these series are not so representative of the Red-Yellow Podzolic great soil group as are soils of the Caroline, Faceville, Ruston, and Vaucluse series. They have similarly colored A and B horizons and a similarly textured A horizon. The B horizon has a yellow hue that generally ranges from strong brown to yellowish brown (7.5YR 5/8 to 10 YR 5/8). The Kalmia soils have developed on stream terraces. They are olive hued (2.5Y 4/4 to 5/4) and are somewhat coarser in texture and more friable than the Marlboro, Norfolk, and Tifton soils. The Marlboro and Tifton soils have a finer textured subsoil than the Norfolk soils, and Tifton soils have many fine pebbles and concretions of iron throughout their profile.

Profile of Kalmia loamy sand, thick surface (1½ miles northeast of Sandy Run Church)--

Ap--0 to 6 inches, olive-brown (2.5Y 4/4) loamy sand; weak, very fine, crumb structure; very friable; many fine pores and roots; pH 5.7; abrupt, smooth boundary.
A2--6 to 14 inches, yellowish-brown (10YR 5/4) loamy sand; weak, very fine, crumb structure; very friable; pH 5.8; clear, smooth boundary.
B2--14 to 26 inches, olive-brown (2.5Y 4/4) sandy loam; very weak, medium, subangular blocky structure; very friable; some pores; pH 5.5; gradual, smooth boundary.
C1--26 to 48 inches +, light olive-brown (2.5Y 5/4) loamy sand; massive (structureless); loose; ground water present; pH 5.4.

The loamy sand surface layer ranges from 12 to 18 inches in thickness. The B horizon ranges from loamy sand to sandy loam.

Profile of Marlboro fine sandy loam, 0 to 2 percent slopes (along paved road in a wooded area 5 miles southeast of St. Matthews and one-half mile west of U.S. Highway No. 176)--

A0--1 inch to 0, partly decomposed leaf litter; many fine roots; pH 5.9.
A1--0 to 8 inches, very dark gray (10YR 3/1) fine sandy loam; weak, medium and fine, crumb structure; very friable; many roots and high in organic-matter content; pH 5.2; abrupt, wavy boundary.
A2--8 to 11 inches, light yellowish-brown (2.5Y 6/4) fine sandy loam; weak, medium, crumb structure; very friable; many fine roots; pH 5.5; clear, smooth boundary.
B2--11 to 30 inches, strong-brown (7.5YR 5/8) clay loam; weak, fine, subangular blocky structure; friable when moist and slightly sticky when wet; few clay films, roots, and old root channels; pH 5.8; gradual, wavy boundary.
B3--30 to 40 inches, yellowish-brown (10YR 5/8) clay loam; weak, very fine, subangular blocky structure; friable when moist; patchy clay skins on a few peds; pH 5.6; gradual, wavy boundary.
C1--40 to 60 inches, mottled, yellowish-brown (10YR 5/8), and red (2.5Y 4/6) clay loam; mottles are few, medium, and distinct; weak, medium, subangular blocky structure; friable; old root channels and clay films; red, soft concretions; pH 5.5; diffuse boundary.

The fine sandy loam surface layer ranges from 8 to 12 inches in thickness. In a few places, the surface layer is a loamy sand. The subsoil ranges from fine sandy clay to clay loam. The depth to the mottled substratum ranges from 36 to 40 inches. In Calhoun County the Marlboro soils are on slopes of 0 to 6 percent.

Profile of Norfolk loamy sand, 0 to 2 percent slopes (in a cultivated field about 800 feet north of State Route 33, Creston to Cameron road, and about 1 mile west of its intersection with State Route 6)--

Ap--0 to 7 inches, gray (10YR 5/1) to grayish-brown (10YR 5/2) light loamy sand; weak, fine, crumb structure; very friable; pH 5.9; abrupt, smooth boundary.
A2--7 to 13 inches, very pale brown (10YR 7/4) light loamy sand with a few, fine, faint, yellowish-brown (10YR 5/6), soft concretions; weak, very fine, crumb structure; very friable; pH 6.6; abrupt, smooth boundary.
B21--13 to 20 inches, yellowish-brown (10YR 5/8) heavy sandy loam with very few, fine, faint, strong-brown (7.5YR 5/8) mottles; weak, fine, subangular blocky structure; friable; many pores and root channels filled with material from the Ap horizon; pH 5.8; clear, smooth boundary.
B22--20 to 32 inches, yellowish-brown (10YR 5/8) sandy loam; weak, fine and medium, crumb structure; very friable to friable; many pores; pH 5.6; gradual, wavy boundary.
B3--32 to 42 inches, mottled, yellowish-brown (10YR 5/6), and brownish-yellow (10YR 6/6) sandy loam with common, medium, distinct, yellowish-red (5YR 5/6) mottles; weak, medium, subangular blocky structure that is more distinct and slightly stronger than structure of B22 horizon; friable; a few clay films; pH 5.5; gradual, wavy boundary.
C1--42 to 60 inches +, mottled, strong-brown (7.5YR 5/6) and gray (10YR 6/1) sandy loam; massive (structureless); friable.

The Ap horizon ranges from gray to grayish brown in color and from loamy sand to loamy fine sand in texture. In the normal Norfolk soils the surface layer is 10 to 18 inches thick; in the thick surface phases it is 18 to 30 inches thick. The texture of the subsoil ranges from sandy loam to light sandy clay loam, and the depth to the C horizon is between 36 and 46 inches. In the thin solum phases, the B horizon is sandy clay loam and the depth to mottling is between 18 and 30 inches. The surface layer of the thin solum phases generally

contains numerous very small, rounded pebbles and concretions of iron. The Norfolk soils in Calhoun County are on slopes of 0 to 10 percent.

Profile of Tifton sandy loam, 2 to 6 percent slopes (in a pecan orchard in front of Dr. Sturkie's house, one-eighth mile west of Staley Crossroad)--

Ap--0 to 7 inches, very dark grayish-brown (10YR 3/2) sandy loam, gray (10YR 5/1 to 6/1) when dry; weak, fine and medium, crumb structure; nonsticky when wet and very friable when moist; pH 5.5; many fine roots; gravel and concretions of iron common; abrupt, smooth boundary.

A2--7 to 10 inches, yellowish-brown (10YR 5/6) sandy loam, very pale brown (10YR 7/3) when dry; weak, very fine and fine, crumb structure; very friable when moist and nonsticky when wet; pH 5.8; fine roots; quartz pebbles and concretions of iron are common, pebbles and concretions 5 to 15 millimeters across; abrupt, smooth boundary.

B21--10 to 22 inches, yellowish-brown (10YR 5/8) sandy clay loam; weak, fine, subangular blocky structure; slightly sticky when wet, friable when moist; pH 5.5; fine pebbles and concretions like those in A2 horizon; clay skins; clear, smooth to wavy boundary.

B22--22 to 32 inches, yellowish-brown (10YR 5/6) sandy clay mottled with red (2.5YR 4/6) and yellow (10YR 7/6 to 8/6); mottles are common, fine, and distinct; red mottles surround iron concretions and pebbles; moderate, medium to coarse, subangular blocky structure; friable and slightly firm; nonsticky when wet; pH 5.4; clay skins; gradual, wavy boundary.

B3--32 to 39 inches, yellowish-brown (10YR 5/6) sandy clay mottled with red (2.5YR 4/6) and yellow (10YR 7/6 to 8/6); mottles are common, medium, and distinct; red mottles surround the iron concretions and pebbles; moderate, medium, angular blocky structure; firm when moist and nonplastic; pH 5.4; patchy clay films.

C1--39 to 48 inches, mottled, yellowish-brown, red, and yellow sandy clay; massive (structureless); firm; pH 5.3.

The sandy loam surface layer ranges from 10 to 12 inches in thickness and contains a variable amount of small pebbles and concretions. The depth to mottling ranges from 24 to 36 inches. The substratum is 36 to 40 inches below the surface in most places.

GREENVILLE, MAGNOLIA, AND ORANGEBURG SERIES

In these series are Red-Yellow Podzolic soils that have some characteristics of Reddish-Brown Lateritic soils. These soils have a red to dark-red, deep subsoil, and they are weathered into the C horizon. The A1 or Ap horizon of the Greenville and Magnolia soils is dark reddish brown to reddish brown. The leached A2 horizon is missing in the Greenville soils and is very thin in the Magnolia soils. In the Orangeburg soils the A1 or Ap horizon is yellowish brown and the A2 horizon is fairly well leached. In these soils chroma and value in the B horizon are uniform, or almost so, and do not vary much from the B horizon to the C1. These soils have developed in a warm, humid climate on well-drained slopes. The Orangeburg soils have a coarser textured subsoil than the Magnolia and Greenville soils.

Profile of Greenville sandy loam, 2 to 6 percent slopes (in a cultivated field on U.S. Highway No. 601, just north of its intersection with road between Fort Motte and Lone Star)--

Ap--0 to 5 inches, dark reddish-brown (2.5YR 3/4 to 3/6) sandy loam; weak, fine, crumb structure; very friable; nonsticky when wet; pH 6.3; abrupt, smooth boundary.

B21--5 to 15 inches, dark-red (10R 3/6) sandy clay loam; weak, fine to very fine, subangular blocky structure; friable; slightly sticky and slightly plastic when wet; fine roots; few worm casts and pores; pH 5.7; gradual, smooth boundary.

B22--15 to 72 inches +, dark-red (10R 3/6) sandy clay; weak, medium, subangular blocky structure; friable when moist and sticky and slightly plastic when wet; not so firm as the B21 horizon; fine roots and pores to a depth of 3 feet; a few roots and clay films on ped faces; pH 5.7.

This soil was wet when examined. The surface layer ranges from dark reddish brown to reddish brown, and the dark-red subsoil grades to red where this soil grades toward the Magnolia soils. Greenville soils are on slopes of 0 to 10 percent.

Profile of Magnolia sandy loam, 2 to 6 percent slopes (in a cultivated field on north side of U.S. Highway No. 601 near the railroad crossing at Singleton)--

Ap--0 to 9 inches, reddish-brown (5YR 4/4) sandy loam; weak, fine, crumb structure; very friable; many roots; pH 6.3; abrupt, smooth boundary.

A2--9 to 11 inches, yellowish-red (5YR 5/8) sandy loam; weak, fine, crumb structure; friable; roots; pH 6.1; abrupt, smooth boundary, broken in places by plowing.

B21--11 to 15 inches, red (10R 4/6) sandy clay loam; weak, medium, subangular blocky structure; friable; pores and root channels; pH 5.9; gradual, smooth boundary.

B22--15 to 66 inches +, dark-red (10R 3/6) sandy clay; moderately strong, medium and fine, subangular blocky structure; friable and moderately sticky in lower part as moisture increases; pH 6.1.

This soil was moist when examined. The sandy loam surface layer ranges from 8 to 12 inches in thickness. The A2 horizon ranges from 1 to 3 inches in thickness but, in some places, is missing or has been removed by tillage. Magnolia soils have 0 to 15 percent slopes.

Profile of Orangeburg loamy sand, 2 to 6 percent slopes (in a cultivated field on State Route 11,

about 3½ miles southeast of its intersection with U.S. Highway No. 601)--

Ap--0 to 9 inches, yellowish-brown (10YR 5/4) loamy sand; weak, fine, crumb structure; very friable; pH 5.5; abrupt, smooth boundary.
A2--9 to 13 inches, yellowish-brown (10YR 5/6) loamy sand; weak, very fine, crumb structure; very friable; pH 5.6; clear, wavy boundary.
B1--13 to 17 inches, yellowish-red (5YR 4/8) sandy clay loam; weak, fine, crumb structure; very friable; many pores; pH 5.2; clear, smooth boundary.
B21--17 to 24 inches, red (2.5YR 4/8) light sandy clay loam or sandy loam; weak, fine, subangular blocky structure; many roots and pores; pores filled with material from the Ap horizon; friable; pH 5.4; clear, smooth boundary.
B22--24 to 48 inches, dark-red (2.5YR 3/6) heavy sandy clay loam; few, faint, medium, yellowish-red mottles; moderate, fine, subangular blocky structure; friable but more firm than B21 horizon; pH 5.6; gradual, smooth boundary.
B3--48 to 66 inches +, red (2.5YR 4/6) sandy clay loam mottled with brownish yellow (10YR 6/8); moderate, medium, subangular blocky structure; friable; pH 4.7; gradual, wavy boundary.

The loamy sand surface layer generally ranges from 10 to 14 inches in thickness, but in a few places the range is 18 to 24 inches. The B horizon ranges from sandy loam to sandy clay loam in texture and from dark red to red or yellowish red in color. Orangeburg soils in Calhoun County are on slopes of 0 to 15 percent.

DUNBAR, GOLDSBORO, IZAGORA, KILLIAN, AND LYNCHBURG SERIES

In these series are Red-Yellow Podzolic soils that have some characteristics of Low-Humic Gley soils. All of these soils have characteristics associated with wetness, but such characteristics are more strongly expressed in the somewhat poorly drained soils, especially in the lower part of the B horizon. Comparing the soils of these series with the red soils of the Red-Yellow Podzolic group is useful. The red soils of the Red-Yellow Podzolic great soil group are well drained. The Lynchburg soils are similar to Norfolk soils, but they are somewhat poorly drained. Izagora soils are on stream terraces and are similar to Kalmia soils, but they are moderately well drained. Dunbar soils are similar to Marlboro soils but are moderately well drained or somewhat poorly drained. Goldsboro soils are similar to Norfolk soils but are moderately well drained. The Killian soils are similar to Norfolk soils but are moderately well drained to somewhat poorly drained and are of finer texture. The subsoil of the Killian soil is firmer than than that of the Norfolk soil and is high in kaolinitic clays.

Profile of Dunbar sandy loam (on south side of county road No. 45, midway between U.S. Highway No. 176 and State Route 6)--

Ap--0 to 6 inches, dark-gray (10YR 4/1) sandy loam; weak, fine, crumb structure; friable; pH 5.5; abrupt, smooth boundary.
A2--6 to 7 inches, light olive-brown (2.5Y 5/2) fine sandy loam; weak, fine, crumb structure; friable; pH 5.3; abrupt, wavy boundary.
B21--7 to 14 inches, yellowish-brown (10YR 5/6) fine sandy clay loam mottled with strong brown (7.5YR 5/6); mottles distinct and fine; weak, fine, subangular blocky structure; friable; pH 5.3; clear, wavy boundary.
B22--14 to 21 inches, yellowish-brown (10YR 5/8) fine sandy clay loam mottled with grayish brown (2.5Y 5/2) and red (2.5YR 4/8); the red mottles are soft concretions; weak, medium, subangular blocky structure; friable; pH 5.5; gradual, wavy boundary.
B3g--21 to 30 inches, grayish-brown (10YR 5/2) fine sandy clay loam mottled with yellowish brown (10YR 5/6) and yellowish red (5YR 4/6); weak, medium, subangular blocky structure; friable to slightly firm; pH 5.5; gradual, wavy boundary.
Cg--30 to 50 inches +, mottled, grayish-brown (2.5Y 5/2), yellowish-brown (10YR 5/8), and yellowish-red (5YR 4/6) sandy clay loam; weak, medium, subangular blocky structure; firm; pH 5.5.

This soil is moderately well drained and somewhat poorly drained. Where drainage is moderate, mottling starts at a depth of 30 inches. The subsoil ranges from sandy clay loam to sandy clay. Slopes range from 0 to 2 percent. Dunbar soils generally grade toward the well-drained Marlboro soils and toward the poorly drained Coxville soils. In a few places, Dunbar soils grade toward the coarser textured Goldsboro soils.

Profile of Goldsboro loamy sand (in a cultivated field approximately 2½ miles south of Shady Grove Church on county road No. 27)--

Ap--0 to 8 inches, very dark grayish-brown (10YR 3/2) loamy sand; weak, fine, crumb structure; very friable; pH 5.7; abrupt, wavy boundary.
A2--8 to 14 inches, light olive-brown (2.5Y 5/4) loamy sand; weak, fine, crumb structure; very friable; contains pockets of material from the Ap horizon; slightly compacted by tillage; pH 5.8; abrupt, wavy boundary.
B21--14 to 24 inches, yellowish-brown (10YR 5/6) sandy clay loam; weak, fine and medium, subangular blocky structure; friable; pH 5.2; clear, wavy boundary.
B22--24 to 32 inches, yellowish-brown (10YR 5/6) sandy clay loam with common, faint, strong-brown (7.5YR 5/8) mottles and a few dark-red (2.5YR 3/6) mottles; the center of some strong-brown mottles is dark red; weak, medium, subangular blocky structure; friable; pH 5.0; gradual, wavy boundary.
C--32 to 48 inches +, gray (2.5Y 6/0) sandy clay loam mottled with strong brown (7.5YR 5/8); mottles are many and distinct; medium, subangular blocky structure; very friable; pH 5.1.

The depth to mottles ranges from 24 to 34 inches. In a few places the surface layer is loamy fine sand. The soil is moderately well drained and lies between the well-drained Norfolk soils and the somewhat poorly drained Lynchburg soils. Slopes range from 0 to 2 percent.

Izagora sandy loam, gray variant (in a cultivated field, approximately $1\frac{1}{2}$ miles northeast of Sandy Run Church)--

Ap--0 to 7 inches, very dark gray (10YR 3/1) sandy loam; weak, fine, crumb structure; friable; many fine roots and pores; pH 5.4; abrupt, smooth boundary.

A2--7 to 15 inches, light brownish-gray (10YR 6/2) loamy sand; weak, fine, crumb structure; friable; pH 5.8; clear, smooth boundary.

B1--15 to 19 inches, light brownish-gray (10YR 6/2) sandy loam; weak, medium and fine, subangular blocky structure; slightly sticky when wet; pH 5.4; clear, smooth boundary.

B21--19 to 23 inches, grayish-brown (10YR 5/2) sandy clay; medium, subangular blocky structure; firm; pH 5.2; clear, smooth boundary.

B22--23 to 38 inches, brown (10YR 5/3) sandy clay with common, medium, distinct, red (2.5YR 5/6) and yellowish-red (5YR 4/8) mottles; medium, subangular blocky structure; firm; pH 5.1; gradual, smooth boundary.

Cg--38 to 48 inches +, gray (5Y 6/1) sandy clay with few, medium, distinct, light olive-brown (2.5Y 5/4) mottles; massive (structureless); firm; contains many fine and medium grains of sand; pH 4.4.

The surface layer of this soil ranges from 10 to 15 inches in thickness. The B horizon is paler and yellower than that in a modal Izagora soil, and the B1 and B2 horizons range from grayish brown to pale yellow. Mottling generally begins in the B22 horizon at a depth of 20 to 30 inches. In some places the mottling is not distinct and the B22 horizon has olive hues. Izagora sandy loam, gray variant, contains a high percentage of kaolinitic clay. Slopes range from 0 to 2 percent.

Profile of Killian loamy sand, 2 to 6 percent slopes (along a dirt road, State Route 86, just south of Savany Hunt Creek and one-fourth mile west of U.S. Highway No. 176)--

Ap--0 to 6 inches, dark-gray (10YR 4/1) loamy sand; weak, fine, crumb structure; very friable; many roots; coarse grains of quartz sand; pH 5.3; abrupt, smooth boundary.

A2--6 to 9 inches, pale-brown (10YR 6/3) loamy sand; weak, medium, crumb structure; friable; coarse grains of sand (2 to 3 millimeters in diameter); pH 5.4; abrupt, wavy boundary.

B21--9 to 16 inches, pale-brown (10YR 6/3) clay with a few light reddish-brown (5YR 6/4) mottles; coarse, subangular blocky structure; firm; high content of kaolinitic clay; many continuous clay films and a few roots on ped surfaces; pH 4.7; clear, wavy boundary.

B22--16 to 27 inches, very pale brown (10YR 7/3) clay with prominent, light reddish-brown (5YR 6/4) mottles and few, faint, reddish-yellow (7.5YR 6/6) mottles; moderate, subangular blocky structure; very firm; many coarse grains of sand in lighter colored mottles; high content of kaolinitic clay; pH 4.9; gradual, wavy boundary.

C1--27 to 40 inches +, mottled, very pale brown (10YR 7/3), light reddish-brown (5YR 6/4), and brownish-yellow (10YR 6/6) sandy clay; massive (structureless); friable; streaks of clay and sandy loam; many coarse grains of sand; fine mica flakes; pH 5.0.

This soil was moist when examined. The loamy sand surface layer ranges from dark gray to light grayish brown in color and from 9 to 18 inches in thickness. In the thick-surface phases the surface layer ranges from 18 to 30 inches in thickness. The B and C horizons range from sandy clay to clay. The B horizon is 10 to 20 inches thick. The thick-surface phases generally have a thinner subsoil. In the B horizon color ranges from very pale brown, pale brown, and light yellowish brown (10YR 7/3, 6/3, 6/4) to pale yellow and pale olive (5Y 7/3 and 6/3) and, in some places, is light gray (5Y 7/2). In some areas where Killian soils grade toward the Vaucluse soils, the soil is pink or reddish yellow (7.5YR 7/4 to 7/8) and mottling is more prominent than it is in the modal soil. Slopes range from 2 to 15 percent.

Profile of Lynchburg sandy loam (in the southeastern part of the county along State Route 91 and about 1 mile northeast of U.S. Highway No. 176)--

A1--0 to 8 inches, very dark grayish-brown (10YR 3/2) sandy loam; weak, medium, crumb structure; very friable; many small roots; pH 5.0; clear, wavy boundary.

A2--8 to 13 inches, dark grayish-brown (2.5Y 4/2) loamy sand; weak, medium, crumb structure; very friable; many small roots; pH 5.0; clear, wavy boundary.

B1--13 to 25 inches, light yellowish-brown (2.5Y 6/4) sandy loam; weak, medium, subangular blocky structure; very friable; pH 5.3; clear, smooth boundary.

B2g--25 to 35 inches, light brownish-gray (2.5Y 6/2) sandy clay loam with many, common, strong-brown (7.5YR 5/6) mottles; moderate, medium, subangular blocky structure; friable; pH 4.8; gradual, irregular boundary.

Cg--35 to 48 inches +, mottled, strong-brown (7.5YR 5/6), and gray (2.5Y 6/0) sandy clay loam; moderate, medium, subangular blocky structure; friable; pH 5.1.

The depth to mottling increases as Lynchburg soils grade toward the moderately well drained Goldsboro soils and decreases as Lynchburg soils grade toward the poorly drained Rains soils. Generally, the depth to mottling ranges from 16 to 26 inches. The A horizon ranges from sandy loam to loamy sand, and the subsoil ranges from sandy loam to light sandy clay loam. Slopes range from 0 to 2 percent.

Low-Humic Gley soils

The Low-Humic Gley great soil group is made up of poorly drained and very poorly drained soils. The soils have a thin surface layer that is moderately high in organic matter. This layer overlies mottled, gray and brown, gleylike, mineral horizons that have little textural differentiation. The soil-development process is mainly gleization.

The soils of this group have formed in acid, marine sediments under a forest consisting of loblolly and pond pines and of hardwoods that include blackgum, sweetgum, maple, and oak. The characteristics of these soils reflect the influence of nearly level relief, a high water table, and impeded drainage more strongly than that of climate and vegetation. The surface layer ranges from dark gray to black. The subsoil ranges from mottled yellow, brown, and gray to dominantly gray in color, and from loamy sand to sandy clay or clay loam in texture.

COXVILLE, GRADY, MYATT, PLUMMER, RAINS, AND WEHADKEE SERIES

In these series are the Low-Humic Gley soils of Calhoun County. These soils lie in nearly level or depressional areas, are poorly drained, and have a high water table. They have similar color in the surface layer and similar color and mottling in the subsoil. The Coxville and Grady soils are finer textured in the surface soil and subsoil than the Myatt and Plummer soils and have more mottling in the subsoil than the Rains soils. Plummer soils are loamy sand or sand throughout the profile. Myatt soils are similar to Rains soils in color, but they have a firmer subsoil and have developed on stream terraces. The Wehadkee soils have developed on flood plains in alluvial material transported from the Piedmont.

Profile of Coxville sandy loam (in a wooded area 1 mile south of Flea Bite Creek and about 300 yards east of U.S. Highway No. 176)--

A00--1 inch to 0, matted leaf litter, mostly pine needles and gum and oak leaves at varying stages of decomposition, but more decomposed next to mineral soils; many fine roots on surface under the mat; abrupt, smooth boundary.

A1--0 to 6 inches, very dark gray (10YR 3/1) sandy loam; moderately strong, coarse and medium, crumb structure; very friable; many fine and coarse roots as much as 20 millimeters in size; pH 4.7; clear, smooth boundary.

A2--6 to 10 inches, gray (10YR 5/1) to grayish-brown (10YR 5/2) sandy loam stained with yellowish-brown (10YR 5/4) mottles; mottles are mainly common and distinct, but a few are very fine and faint; moderately strong, fine and medium, crumb structure; roots like those in the A1 horizon; pH 4.9; clear, wavy boundary.

B21--10 to 18 inches, gray (10YR 5/1) fine sandy clay loam mottled with yellowish brown (10YR 5/8); mottles are common, fine, and distinct; weak, fine, subangular blocky structure; friable when moist and slightly sticky when wet; pH 4.9; gradual, wavy boundary.

B22g--18 to 26 inches, grayish-brown (10YR 5/2) sandy clay loam with many, coarse, distinct, yellowish-brown (10YR 5/6) mottles and common, medium, distinct, red (2.5YR 4/8) mottles; medium, subangular blocky structure with some particles tending to be angular, especially in zone of red mottling; friable when moist, nonsticky when wet, and slightly hard when dry; pores and fine root channels and a few clay skins; pH 4.7; gradual, wavy boundary.

B3g--26 to 37 inches, gray (10YR 6/1) fine sandy clay mottled with yellowish brown (10YR 5/8) and red (2.5YR 4/8); mottles are common and prominent; medium and coarse, subangular blocky structure; pH 4.7; gradual, wavy boundary.

Cg--37 to 55 inches +, dark-gray (10YR 4/1) clay mottled with yellowish brown (10YR 5/6); mottles are many, medium, and distinct; mostly massive (structureless), but upper 8 inches has some weak, fine, subangular blocky structure; very firm and plastic; few spots or pockets of gray (10YR 5/1) sandy clay; few clay skins; some fine roots and root channels; small amount of ground seepage at 37 inches; pH 4.7.

In cultivated areas the A1 horizon is dark gray. The depth to mottling varies from place to place, and in many places the B21 horizon is not mottled. In places the red mottles are not prominent or are missing in the B22g and B3g horizons. The subsoil ranges from sandy clay to clay. Slopes range from 0 to 2 percent but are generally not more than 1 percent.

Profile of Grady loam (in a wooded area on the south side of U.S. Highway No. 601 and about 1 mile northeast of its intersection with State Route 11)--

A1--0 to 5 inches, very dark grayish-brown (10YR 3/2) loam; weak, fine, crumb structure; friable when dry and sticky when wet; many roots; pH 5.3; abrupt, smooth boundary.

B1--5 to 7 inches, gray (10YR 5/1) sandy clay loam; weak, medium, crumb structure; soft and friable when dry and sticky when wet; many roots; pH 5.1; abrupt, smooth boundary.

B21--7 to 20 inches, gray clay mottled with yellowish brown (10YR 5/4); mottles common, medium, and distinct; weak, fine, subangular blocky structure; firm when dry and slightly sticky when wet; pH 5.0; clear, smooth boundary.

B22--20 to 32 inches, gray (10YR 6/1) clay mottled with yellowish brown (10YR 5/8) and red (2.5YR 4/8); mottles few, fine, and distinct; medium, subangular blocky structure; firm when dry and slightly sticky when wet; pH 5.0; abrupt, smooth boundary.

C1g--32 to 48 inches, gray (10YR 6/1), mottled with yellowish-red (5YR 5/8) and dark-red (2.5YR 3/6) clay; mottles few, fine, and distinct; massive (structureless); firm to very firm; a few sand grains.

The surface layer ranges from black or dark gray to very dark grayish brown. It is sandy loam to

loam in most places but, in some places, is silt loam. In many individual areas texture is finer in the lower lying center parts than it is on the edges. The subsoil ranges from gray to light gray, and in some places the mottling is less distinct than normal and is sometimes absent. Slopes range from 0 to 2 percent.

Profile of Myatt loamy sand (in a wooded area along a private road, one-half mile east of U.S. Highway No. 176 and 4 miles south of the Lexington County line)--

A1--0 to 6 inches, dark-gray (2.5Y 4/0) loamy sand; weak, coarse, crumb structure; friable; many fibrous, mottled roots; pH 4.6; abrupt, smooth boundary.
A2--6 to 13 inches, light-gray (2.5Y 7/0) loamy sand; weak, fine, crumb structure; friable; pH 5.3; clear, smooth boundary.
B21g--13 to 19 inches, light-gray (10YR 7/1) sandy clay loam with a few, distinct, yellowish-brown (10YR 5/8) mottles; pH 5.2; clear, smooth boundary.
B22g--19 to 35 inches, light-gray (10YR 7/1) sandy clay with many, prominent, yellowish-brown (10YR 5/8) mottles; moderate, coarse, subangular blocky structure; firm; pH 5.1; gradual, smooth boundary.
C1g--35 to 52 inches +, light-gray (10YR 7/1) sandy loam; massive (structureless); firm; pH 5.1.

The A1 horizon ranges from 6 to 9 inches in thickness and from dark gray to very dark gray in color. In some few places the subsoil is loamy sand.

Profile of Plummer loamy fine sand (in a wooded area 5 miles southeast of Cameron and one-fourth mile south of U.S. Highway No. 176, on south side of county road No. 19 north of Polk Spring Creek)--

A1--0 to 6 inches, black (2.5Y 2/0) loamy fine sand; coarse, crumb structure; very friable; pH 5.3; abrupt, smooth boundary.
Cg--6 to 32 inches, gray (10YR 5/1 to 10YR 6/1) sand with layer of dark-brown (10YR 3/4), compact sand; structureless and loose; pH 5.7.

Profile of Rains sandy loam (in a wooded area on south side of State Route 91, approximately 1 mile east of U.S. Highway No. 176)--

A1--0 to 6 inches, very dark gray (10YR 3/1) sandy loam; weak, fine, crumb structure; friable; many fine roots; pH 5.2; clear, smooth boundary.
A3--6 to 13 inches, gray (10YR 5/1) sandy loam; few, fine, distinct, yellowish-brown (10YR 5/6) mottles; friable; weak, medium; subangular blocky structure; many fine roots and pores; pH 5.0; gradual, smooth boundary.
B2g--13 to 26 inches, gray (10YR 5/1) sandy clay loam with many, medium and coarse, distinct, yellowish-brown (10YR 5/6) mottles; weak, coarse, subangular blocky structure; friable; few fine roots and small pores; pH 5.1; clear, smooth boundary.
Cg--26 to 42 inches +, mottled, yellowish-brown, gray, and red mixed loamy sand and clay; massive (structureless); pH 5.1; few fine roots and small pores.

The sandy loam A1 horizon ranges from 4 to 8 inches in thickness. It is black in some places. The B horizon extends to a depth of 24 to 36 inches and ranges from sandy loam to light sandy clay loam. The yellowish-brown mottles are generally distinct and vary from common to many.

Profile of Wehadkee silt loam (in woods about 2 miles east of Sandy Run Church and about one-tenth mile north of a county road)--

A1--0 to 7 inches, dark yellowish-brown (10YR 4/4) silt loam; moderate, coarse, crumb structure; friable; nonsticky and nonplastic when wet; many roots; pH 5.5; gradual, smooth boundary.
C1g--7 to 24 inches, dark-gray (10YR 4/1) silty clay loam mottled with dark grayish brown (10YR 4/2); mottles many, fine, and faint; moderate, fine and medium, crumb structure; firm; a few soft iron or manganese concretions; few roots; pH 5.2; gradual, smooth boundary.
C2g--24 to 40 inches +, mottled, gray (7.5YR 5/0), dark-gray (7.5YR 4/0), and yellowish-brown (10YR 5/4) silty clay; mottles common, fine, and faint; massive (structureless); firm; plastic but nonsticky when wet; few roots; pH 5.3.

The surface layer ranges from 6 to 12 inches in thickness and from dark yellowish brown to brown or dark brown in color. The C1 horizon ranges from dark gray to grayish brown as the soil grades toward the Chewacla soils. Mottles range from faint to distinct. The texture of the surface layer and subsoil ranges from silt loam to silty clay loam, and in places, the subsoil contains strata of loamy fine sand or sand.

Humic Gley soils

The Humic Gley great soil group consists of poorly drained or very poorly drained soils. These soils have moderately thick, dark-colored, organic-mineral horizons over mineral horizons that are gleyed. The main process of soil development was gleization.

The soils in this group have formed in acid, marine sediments in areas where the ground-water level fluctuated but was fairly high. Runoff was very slow. The forest cover was chiefly loblolly pine, water-tolerant oak, sweetgum, red maple, blackgum, and yellow-poplar.

OKENEE, PORTSMOUTH, AND RUTLEGE SERIES

In these series are the Humic Gley soils of Calhoun County. These soils are very poorly drained and have very dark gray or black surface soils. Their subsoils are gray and range from sandy loam to sandy clay loam. In wooded areas the organic-matter content in the A horizon ranges from about 5 to 15 percent. The Okenee soils have

developed on stream terraces, and the Portsmouth soils have developed in depressions on the Coastal Plain uplands.

Profile of Okenee loam (three-fourths mile east of U.S. Highway No. 21 and 1 mile south of Lexington County line, on Gullidge farm in a slight depression near the barn in a cornfield)--

A1p--0 to 7 inches, black (10YR 2/1) loam; weak, fine, crumb structure; very friable; very high in organic-matter content; pH 5.6; abrupt, smooth boundary.
A12--7 to 18 inches, black (10YR 2/1) loam; weak, fine, crumb structure; very friable; pH 4.3; clear, smooth boundary.
A3--18 to 22 inches, very dark gray (10YR 3/1) sandy loam; weak, fine, crumb structure; very friable; pH 4.6; clear, smooth boundary.
B21g--22 to 34 inches, dark-gray (5YR 4/1) heavy sandy loam; weak, medium, subangular blocky structure to massive (structureless); pH 4.6; diffused, smooth boundary.
B22g--34 to 55 inches, dark-gray (10YR 4/1) light sandy clay loam; friable; weak, medium, subangular blocky structure to massive (structureless); patchy clay skins; pH 4.6; clear, smooth boundary.
Cg-55 to 70 inches +, dark-gray (5YR 4/1) sandy clay loam; massive (structureless); clay skins on ped faces along vertical cracks; some coarse sand and fine gravel; pH 4.9.

The A horizon ranges from 14 to 22 inches in thickness and from loam to sandy loam in texture. The sandy loam texture is more noticeable where this soil grades toward a poorly drained Myatt soil. The subsoil ranges from sandy loam to sandy clay loam.

Profile of Portsmouth loam (in a cultivated field about one-fourth mile north of a dirt road and about one-half mile east of U.S. Highway No. 176)--

A1--0 to 8 inches, black (2.5Y 2/0) loam; weak, coarse, crumb structure; friable; pH 5.9; abrupt, smooth boundary.
A2--8 to 14 inches, dark-gray (10YR 4/1) sandy loam; weak, medium, subangular blocky structure; friable; pores fine, many, and medium; pH 5.0; clear, wavy boundary.
B21g--14 to 21 inches, dark-gray (10YR 4/1) sandy clay loam with dark yellowish-brown (10YR 4/4) mottles; mottles few, medium, and distinct; medium, subangular blocky structure; friable; pH 4.7; gradual, wavy boundary.
B22g--21 to 30 inches, gray (10YR 5/1) sandy clay loam with few, fine, and distinct, yellowish-brown (10YR 5/8) mottles; weak, fine, subangular blocky structure; slightly sticky when wet; pH 4.9; gradual, wavy boundary.
Cg--30 to 48 inches +, grayish-brown sandy clay loam with few, faint, yellowish-brown (10YR 5/8) mottles; massive (structureless); slightly sticky; pH 4.7.

The A1 or Ap horizon ranges from 8 to 14 inches in thickness and from very dark gray to black. The texture of the entire A horizon ranges from sandy loam to loam. The subsoil is sandy loam to sandy clay. In many places the yellowish-brown mottling is missing.

Profile of Rutlege loamy fine sand (in a wooded area 5 miles southeast of Cameron and one-fourth mile south of U.S. Highway No. 176, on south side of county road No. 19 north of Polk Spring Creek)--

A1--0 to 6 inches, black (2.5Y 2/0) loamy fine sand; coarse, crumb structure; very friable; pH 5.3; abrupt, smooth boundary.
A2--6 to 14 inches, very dark gray (5Y 3/1) loamy fine sand; structureless and loose; pH 5.5; abrupt, smooth boundary.
Cg--14 to 32 inches, gray (10YR 5/1 to 10YR 6/1) sand with dark-brown (10YR 4/3), compact layer of sand; structureless and loose; pH 5.7.

The A1 horizon ranges from very dark gray to black in color and from 5 to 7 inches in thickness. The texture of the entire profile ranges from sand to loamy sand or loamy fine sand.

Regosols

The Regosol great soil group consists of soils in which few or no clearly expressed soil characteristics have developed. These soils have formed in deep, unconsolidated, soft, mineral deposits.

EUSTIS AND LAKELAND SERIES

The soils of these series are the Regosols in Calhoun County. They have weakly developed profiles and have formed in beds of marine sand or of loamy sand that consists mainly of quartz particles. In most places the entire profile of these soils is sand or loamy sand. They have dark-gray or grayish-brown A1 horizons and thick, leached A2 horizons. Because the A3 and B1 horizons are yellowish brown and yellowish red, these soils grade toward the Red-Yellow Podzolic soils. This color is especially noticeable in the shallow phases and where the subsoils have a loamy sand texture. Color is the main difference between the Eustis soils and the Lakeland soils. The Eustis soils have yellowish-red subsoils, and the Lakeland soils have yellowish-brown subsoils.

Profile of Eustis loamy sand on slopes of 0 to 2 percent (in a cultivated field west of U.S. Highway No. 176, just north of Little Beaver Creek)--

Ap--0 to 6 inches, brown (10YR 4/3) loamy sand; weak, fine, crumb structure; very friable; roots; some grains of coarse sand; pH 5.5; clear, smooth boundary.
B1--6 to 11 inches, yellowish-red (5YR 5/8) loamy sand; weak, fine, crumb structure; roots plentiful; pH 5.8; gradual, smooth boundary.
B2--11 to 33 inches, yellowish-red (5YR 4/8) loamy sand; weak, coarse or medium, crumb structure; very friable; many roots; fine pores filled with material from the Ap horizon; grains of coarse sand; pH 5.4; gradual, smooth boundary.

B3--33 to 37 inches, yellowish-red (5YR 4/8) loamy sand; weak, medium or coarse, crumb structure; very friable; many pores; grains of coarse sand; pH 5.7; gradual, smooth boundary.
C1--37 to 45 inches, yellowish-red (5YR 4/8) light loamy sand; massive (structureless); loose to very friable; many grains of coarse sand; pH 5.8; gradual, smooth boundary.
C12--45 to 60 inches +, yellowish-red (5YR 4/8) sandy loam; massive (structureless); very friable; many grains of coarse sand.

The texture of the profile ranges from sand to loamy sand. In many places, especially where the texture is more sandy than normal, this soil has a leached A2 horizon or a thick A3 horizon. The depth to the C horizon ranges from 3 to 5 feet, and in the shallow phase a sandy loam or sandy clay C or D horizon occurs at a depth of 30 to 42 inches. The loamy sand subsoil ranges from yellowish red to yellowish brown. Slopes range from 0 to 15 percent.

Profile of Lakeland sand, 0 to 6 percent slopes (1 mile west of U.S. Highway No. 21, on State Route 33 and one-fourth mile north of the county line)--

Ap--0 to 6 inches, very dark grayish-brown (2.5Y 3/2) sand; weak, very fine, crumb structure; very friable; pH 5.5; abrupt, smooth boundary.
A2--6 to 21 inches, yellowish-brown (10YR 5/4) sand; weak, very fine, crumb structure; very friable; pH 5.4; gradual, smooth boundary.
B1--21 to 48 inches, strong-brown (7.5YR 5/6) sand, the color distinguishing it from sand in the A2; weak, fine, crumb structure; very friable; pH 5.0; gradual, wavy boundary.
C1--48 to 66 inches, brownish-yellow (10YR 6/8) sand with few, faint, medium, very pale brown (10YR 7/4) mottles; structureless; loose; pH 5.4; diffuse, wavy boundary.
C2--66 inches +, very pale brown (10YR 7/4) fine sand; structureless; loose; pH 5.8.

The B horizon ranges from sand to loamy sand in texture and from brownish yellow to yellowish brown in color. The sand in which these soils have developed ranges from 3 to 10 feet in depth. In the shallow phase the sandy material ranges from 30 to 48 inches in depth and generally overlies firm sandy loam or sandy clay material. Slopes range from 0 to 15 percent.

Alluvial soils

Alluvial soils are forming in transported material of fairly recent deposition. They are characterized by weak or no modification of the original material by the soil-forming processes.

CHEWACLA AND CONGAREE SERIES

In these series are the Alluvial soils of Calhoun County. These soils receive additional soil material during floods. They are developing on the flood plains in alluvium that was washed from the medium- to fine-textured soils of the Piedmont Plateau and the Blue Ridge Mountains. Chewacla soils are somewhat poorly drained, and Congaree soils are well drained.

Profile of Chewacla silt loam (on the flood plain of the Congaree River, about one-half mile east of U.S. Highway No. 176)--

A1--0 to 7 inches, dark-brown (7.5YR 4/4) silt loam; moderate, very fine, subangular blocky structure; slightly sticky; a few finely divided mica flakes; pH 5.7; abrupt, smooth boundary.
B1--7 to 19 inches, dark-brown (7.5YR 4/4) silty clay loam with a few, faint, brown (10YR 5/3) and gray (10YR 5/2) mottles; moderate, fine, subangular blocky structure; slightly plastic; many finely divided mica flakes; pH 5.7; gradual, smooth boundary.
C1--19 to 30 inches, mottled, dark yellowish-brown (10YR 4/4) and light yellowish-brown (10YR 6/2) silty clay loam; fine, subangular blocky structure; slightly plastic; many finely divided mica flakes; pH 5.9; gradual, smooth boundary.
Cg--30 to 60 inches +, brown (10YR 5/3) silty clay; massive (structureless); sticky.

This soil was wet when examined. The texture of the surface soil and subsoil ranges from silt loam to silty clay loam. In places there are strata of fine sand, loamy sand, or sandy loam. The depth to mottling generally ranges from 18 to 24 inches, but in some places faint, brownish-gray mottles occur above a depth of 18 inches. In some areas the recent alluvium overlies gray or light-gray sandy clays of old stream terraces at a depth of 16 to 24 inches.

Profile of Congaree silt loam (in a cultivated field on the flood plain of the Congaree River, about one-half mile east of U.S. Highway No. 176)--

Ap--0 to 11 inches, dark-brown (7.5YR 4/4) silt loam; moderate, fine, crumb structure; friable; discontinuous clay films present; pH 5.4; abrupt, smooth boundary.
C11--11 to 17 inches, dark-brown (7.5YR 4/4) very fine sandy loam; weak, subangular blocky structure; friable; slightly compacted plowpan 2 to 3 inches thick; pH 5.6; abrupt, smooth boundary.
C12--17 to 45 inches +, dark yellowish-brown (10YR 4/4) fine sand; weak, crumb structure; very friable; many finely divided mica flakes; pH 5.8.

This soil was wet when examined. The brown color is uniform to a depth of 36 to 48 inches and is mottled with gray below that depth. In a few places mottling is at a depth of 33 inches. In places the profile has strata of fine sand, loamy fine sand, or fine sandy loam.

Additional Facts About the County[7]

This section is primarily for those who are not familiar with Calhoun County. It discusses early

[7] Except for the "Climate" subsection, W. A. MASON, Jr., management agronomist, Soil Conservation Service, wrote this section.

agriculture, current trends in use of soils for crops and pasture, climate, and other subjects of general interest. The statistics are from the U.S. Census of Agriculture.

Early Agriculture

The first land grant for what is now Calhoun County was made in 1704 by the King of England to Robert Sterling. It consisted of 570 acres on Lyons Creek, about 4 miles south of St. Matthews on the Charleston road. The English and the Huguenots, who were French, settled mostly on land adjoining the grant. Agricultural settlements increased between 1735 and 1737 when Swiss-German immigrants were granted tracts on the Edisto River in the southern part of the State and on Sandy Run Creek in the northern part of Calhoun County. These tracts ranged in size from 50 to 100 acres.

The immigrants brought with them seeds of crops that were native to areas of the cool climate they had left, but the crops failed in the warm climate of this county. Then the immigrants made their living by producing tar, rosin, turpentine, staves, shingles and lumber, beef, pork, and hides. Early agriculture was mostly self sustaining. Cattle were grazed in the forests, which at that time furnished good grazing. Indigo was first grown in 1740 but was given up about 1775. Corn, wheat, and oats were grown until 1850. At that time rust began to damage the oats, and only small acreages were grown until rustproof varieties were introduced in 1865. Rice was grown for a few years after the Civil War, but the crop could not compete with rice grown in other areas. By 1850 cotton had become the principal crop and remained so until recently, when soybeans became more important. The turpentine industry was started after the Civil War and was profitable until near the turn of the century. The production of pecans increased, and in 1920 the processing of pecans was started at Cameron. Sweetpotatoes, Irish potatoes, snap beans, and English peas are grown to some extent at the present time.

Crops, Pasture, and Livestock

In table 10 are listed the acreages in crops and cropland pastured and the number of cattle, calves, and milk cows in the county between 1939 and 1959. There was a general but decided decrease in acreages planted to cotton and corn between 1939 and 1959. During this period acreages in wheat and oats have generally increased. Acreages in cotton and wheat have largely depended on acreage-control programs. The acreages in corn and oats varied with acreage control of cotton and wheat and with the local demands for livestock feeds as well as with market prospects.

The acreage of cropland diverted to perennial pasture gradually increased between 1939 and 1954. After 1954 the acreage in pasture decreased, probably because of the Soil Bank and Conservation Reserve Program.

Since 1947 the acreages in small grains and soybeans have increased because the demand for cotton has lessened and farmers have expanded other crops. The general upward trend of the acreages in wheat and oats is shown in table 10. By about 1954 the practice of double cropping decidedly increased. In this practice soybeans are planted for oil as soon as a small grain is harvested. Double cropping has been lessening, however, and the acreage in soybeans has been somewhat lower than in the peak years of 1957 and 1958. Nevertheless, soybeans continue to be one of the major cash crops in the county and are of considerable economic importance. Table 11 lists the acreages in soybeans harvested in Calhoun County from 1954 through 1960, and the value of the crop.

The acreage of cropland pastured almost doubled between 1939 and 1959, as shown in table 10. Coastal bermudagrass accounts for practically all of this increase. This grass is suited to many kinds of soils and can be used for grazing, hay, silage, or pelleting. A recently installed pelleting plant in St. Matthews has a capacity of 5 tons of pellets per hour.

Coastal bermudagrass can be managed intensively to increase the number of livestock in the county. Small areas are planted to sericea lespedeza for summer grazing or for hay. A few acres of kudzu may be grazed in an emergency.

Grazing lands in this county are generally fertilized irregularly if at all, and controlled grazing and systematic management are seldom practiced. A few dairymen, however, use annual grazing crops, such as small grains and ryegrass

TABLE 10.--Acreage in crops and number of livestock in stated years

Crops and livestock	1939	1949	1954	1959
	Acres	Acres	Acres	Acres
Cotton harvested	23,800	25,384	18,474	12,851
Corn for all purposes	40,444	32,776	18,799	11,660
Wheat threshed	2,783	2,795	5,683	7,390
Oats threshed	5,898	8,433	24,691	19,154
Pasture (on cropland)	5,831	8,723	11,981	10,451
	Number [1/]	Number [1/]	Number	Number
Cattle and calves	3,252	5,040	9,023	6,522
Milk cows	1,491	1,158	1,217	1,180

[1/] One year later than date shown at the head of the column.

TABLE 11.--Acreage in soybeans harvested and value of crop from 1954 through 1960

Year	Acres harvested	Value of crop
1954	31,400	$ 370,000
1955	42,800	1,414,000
1956	53,500	893,000
1957	55,000	1,920,000
1958	54,500	1,782,000
1959	48,000	1,584,000
1960	49,000	2,094,000

in winter or millet in summer, to supplement their perennial pasture.

Agricultural Trends

The acreages planted to the various kinds of crops between 1939 and 1959 have directly affected the number, size, and type of farm in the county. The number of farms decreased from 1,749 in 1940 to 832 in 1959, and in the same years the average size of farm increased from 105.9 acres to 195.8 acres. The increased use of fertilizer and lime has been a big factor in increasing crop yields and in changing farm management. In 1959 farmers used 18,480 tons of commercial fertilizer, as compared to 11,565 tons in 1940.

Along with a gradual decrease in the number of farms and an increase in their size, the number of farm animals used for work has greatly decreased, and the number of tractors, corn pickers, and combines has greatly increased. The increased acreages in soybeans and small grains have brought about a significant increase in the number of combines, many of which are self propelled. The number of these machines increased from 193 in 1950 to 339 in 1959. By 1959 there were 28 mechanical cotton pickers in operation in the county, 84 corn pickers, and 945 tractors. Between 1940 and 1959, the number of horses and mules available for farmwork decreased from 3,449 to 858.

A planned land-use program began in 1937 in Calhoun County when the U.S. Department of Agriculture set up its demonstration project for erosion control. But for several years before 1937 a program for reduction of crops had been in effect. In the fall of 1939 Calhoun County joined with Richland and Lexington Counties to form the Congaree Soil Conservation District, which operated for 8 years. In 1947 this district was subdivided, and the present Calhoun County Soil Conservation District was formed.

Although the county remains entirely agricultural, the rural farm population decreased 41.5 percent between 1930 and 1950. Land use and acreage controls have greatly reduced the acreage planted to row crops, and mechanization has further reduced the need for unskilled farm labor. The rural nonfarm population increased 110 percent between 1930 and 1950. In 1950 about 6,900 rural people worked outside the county.

Climate [8]

The climate of Calhoun County is mild and temperate, and rainfall is well distributed throughout the year. In table 12 the temperature and precipitation of the county were estimated by combining

[8] NATHAN KRONBERG, State climatologist, U.S. Weather Bureau, wrote this subsection.

TABLE 12.--Estimated temperature and precipitation for Calhoun County, S. C.

[Estimates made by combining data recorded at Orangeburg, in Orangeburg County, and at Columbia, in Richland County]

Month	Temperature				Precipitation			
			Two years in 10 will have at least 4 days with--			One year in 10 will have--		
	Average daily maximum	Average daily minimum	Maximum temperature equal to or higher than--	Minimum temperature equal to or lower than--	Average monthly total	Less than--	More than--	Average snowfall
	°F.	°F.	°F.	°F.	Inches	Inches	Inches	Inches
January----	60	37	77	22	2.8	1.4	4.6	0.3
February---	62	38	78	23	3.7	1.1	5.8	(1/)
March------	68	44	82	28	3.8	1.5	6.4	(1/)
April------	77	52	88	37	3.6	1.5	6.2	---
May--------	85	60	94	48	3.3	1.5	5.5	---
June-------	91	68	100	59	4.3	2.1	6.5	---
July-------	92	71	100	65	5.7	2.3	7.5	---
August-----	91	70	99	62	5.6	2.2	9.8	---
September--	86	64	96	54	4.3	1.5	7.1	---
October----	78	52	87	36	2.6	.7	5.4	---
November---	67	42	80	27	2.4	.7	4.2	(1/)
December---	59	36	76	21	3.2	.9	5.0	.4
Year--	76	53	2/ 102	3/ 18	45.3	32.3	54.7	0.7

1/ Trace, less than .05 inch.

2/ Average highest annual maximum.

3/ Average lowest annual minimum.

data recorded at the U.S. Weather Bureau Stations at Orangeburg, in Orangeburg County, and at Columbia, in Richland County. The elevation at St. Matthews, in Calhoun County, is 269 feet, which is higher than the elevation at Orangeburg (244 feet) and lower than that at Columbia (315 feet). The day-to-day weather is controlled largely by pressure systems that cross the Nation, but in summer only a few complete exchanges of air masses occur, and masses of tropical air persist for extended periods.

Records of wind and humidity are not available for Calhoun County. The records of the nearby station at Columbia, however, indicate that the prevailing wind is from the northeast in the winter and from the southwest in summer; the average speed is about 7 miles per hour. The strongest recorded wind lasting 1 minute in the Columbia area occurred in March and was 60 miles per hour.

The average relative humidity at 1:00 p.m. ranges from a maximum of 58 percent in winter to a minimum of 47 percent in April and May. Based on daily observations at 1:00 a.m., 7:00 a.m., 1:00 p.m., and 7:00 p.m., the average humidity for the year is approximately 70 percent.

In an average year about 70 to 75 days have 0.10 inch or more of rain, 30 to 35 days have half an inch or more, and about 15 days have 1 inch or more. During the year, the sun is visible for about 65 percent of the daylight hours. The percentage of sunny days ranges from the low fifties in December and January to the low seventies in May and June. The skies are cloudy or overcast about 35 percent of the time. About 2 percent of the time the clouds are below 500 feet, and about 6 percent of the time they are below 1,000 feet. Records at Orangeburg show that 68.29 inches, in 1948, was the heaviest annual rainfall in this general area in the past 30 years. The least annual rainfall was 25.50 inches, in 1954.

Summers are generally long. The warm weather lasts from some time in May into September, and the heat is broken only a few times during midsummer. In a typical summer about 5 days have a maximum temperature of 100 degrees F., or more; 2 of these days are in June, 2 in July, and 1 in August. Occasionally a day in spring or fall has a temperature of 100 degrees or more. On the average about 80 days have a temperature of 90 degrees or higher. The highest temperature recorded was 107 degrees, which has occurred about twice in this area in the last decade. Summer is the rainiest season of the year in Calhoun County. The 3 summer months provide 35 percent of the total annual precipitation. Rains in summer come largely in local thundershowers. Tropical storms affect Calhoun County on an average of once or twice a decade and bring strong winds and heavy rains, though they cause only minor damage. These storms are a threat from midsummer through fall, but they occur most often during September (4, 5, 17).

Fall generally is the most pleasant season of the year in this county; cold spells do not begin until late in November. About 20 percent of the total annual rainfall comes in fall. The rainfall, however, is light, the sun shines much of the time, and temperature extremes seldom occur. Hurricanes are most frequent in September. During this month heavy to excessive rains, with gusty winds of gale force from nearby tropical storms, have occurred about five times in the past 30 years, but damage and casualties were negligible (4, 5, 17).

Winters in Calhoun County are mild and fairly short; freezing temperatures occur on about one-third of the days. Snow flurries are frequent in winter, but snow seldom remains on the ground for more than 1 or 2 days. In an average winter the temperature falls to 20 degrees or lower in about 5 days. A temperature of 15 degrees or less occurs on an average of once in December and once in January. Only once since January 1948 has a temperature below 10 degrees been recorded in the area. Generally, rains are steady in winter, and about 22 percent of the total annual rain falls during this season (4, 5, 17).

Spring is the most changeable period of the year and is frequently cold and windy in March but generally warm and pleasant in May. In this season severe, local thunderstorms and tornadoes are most likely. Calhoun County has had about six tornadoes in the past 40 years. The rainfall in spring makes up about 23 percent of the total annual precipitation.

The climate favors the production of the crops grown in the county. The main products of the county, in order of their importance, are soybeans, cotton, corn, oats, wheat, hay, and milk. During most years the soils accumulate so much moisture in winter and spring that they are at full capacity at planting time. Also, there are enough dry periods to permit tillage. Table 13 lists the chances of freezing temperatures after a given date in spring and before a given date in fall. The frost-free season lasts from March 16 to November 17, or about 246 days. This period is long enough for crops to mature, though they may be planted any time in a period of weeks or even months.

Normally, rain comes during the growing season in amounts suitable for crops, but in some years it is inadequate or excessive. Table 12 shows the extreme deficiencies and excesses in monthly and annual rainfall that might occur once in about 10 years. To illustrate, the average rainfall in July is 5.7 inches, but one July in ten may have less than 2.3 inches of rain and another July during a 10-year period may have more than 7.5 inches (4, 5, 17).

Droughts were disastrous in 1925 and 1954. Partial droughts occur once or twice in 10 years. By definition, a drought occurs when there is no water available to plants in the soil (19). A drought day is a day during which no water is available to the plants. Even in a normal year periods occur when rainfall does not supply the water needed by most crops. Thus, during most years supplementary irrigation is required for maximum crop production in most parts of the State. During a severe drought, however, the water for irrigation is often in short supply or nonexistent.

In table 14 are estimates for Calhoun County of the frequency of drought days, or days when there is no water in the soil available to plants. These estimates were obtained by using the Penman method to compute evapotranspiration, or the

TABLE 13.--Chance of last freezing temperature in spring and first in fall

[All data from Orangeburg or Columbia, S. C., or both]

Chance 1/	Temperature in spring of--			Temperature in fall of--		
	24° F., or less, after--	28° F., or less, after--	32° F., or less, after--	24° F., or less, before--	28° F., or less, before--	32° F., or less, before--
1 in 10	Mar. 6	Mar. 20	Apr. 6	Nov. 25	Nov. 12	Nov. 2
2 in 10	Feb. 26	Mar. 13	Mar. 30	Dec. 1	Nov. 18	Nov. 7
5 in 10	Feb. 9	Feb. 27	Mar. 16	Dec. 12	Nov. 28	Nov. 17

1/ Chance of a temperature as low as that listed on or after date in spring and on or before date in fall.

TABLE 14.--Chance of drought days on soils of different moisture-storage capacity (19)

Month 1/	Chance	Minimum drought days if soil has a moisture-storage capacity of 2/--				
		1 inch	2 inches	3 inches	4 inches	5 inches
April	1 in 10	15	4	0	0	0
	2 in 10	13	3	0	0	0
	3 in 10	11	0	0	0	0
	5 in 10	9	0	0	0	0
May	1 in 10	25	25	21	14	8
	2 in 10	23	21	17	9	0
	3 in 10	21	18	13	0	0
	5 in 10	17	14	8	0	0
June	1 in 10	23	22	21	19	17
	2 in 10	21	19	17	15	13
	3 in 10	19	16	15	12	9
	5 in 10	16	12	9	6	0
July	1 in 10	22	20	19	18	15
	2 in 10	19	17	16	13	12
	3 in 10	16	13	12	10	8
	5 in 10	12	7	6	3	0
August	1 in 10	20	16	13	12	11
	2 in 10	17	12	8	7	4
	3 in 10	15	9	6	3	2
	5 in 10	11	2	0	0	0
September	1 in 10	22	19	17	15	14
	2 in 10	19	15	12	9	8
	3 in 10	17	12	9	5	0
	5 in 10	14	8	0	0	0
October	1 in 10	27	26	24	22	20
	2 in 10	23	20	16	14	11
	3 in 10	20	16	11	6	3
	5 in 10	15	9	0	0	0

1/ January, February, March, November, and December are not shown, because in these months crops are rarely damaged by drought.

2/ Storage capacity of soil is expressed as the depth of water that a soil can hold available to plants.

consumption of soil moisture by plants and evaporation. The total amount of moisture that can be stored for the use of plants varies with the kind of soil and the depth to which roots grow. Therefore, table 14 shows the chance of an estimated number of drought days at moisture-storage capacities of 1 to 5 inches. For example, during July on a soil with a 2-inch storage capacity, the chance is five in ten that there will be 7 days when the soil has no water available to plants (19).

The automatic rain gage at St. Matthews has recorded the following maximum intensities of rainfall for the 10-year period, 1940 to 1950 (16):

Duration in hours	Amount in inches
1	1.87
2	2.70
3	2.80
6	3.47
12	4.72
24	7.20

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Glossary

Acidity. (See Reaction.)

Alluvium. Fine material, such as sand, silt, or clay, that has been deposited on land by streams.

Available moisture capacity. The difference between the amount of water in a soil at field capacity and the amount in the same soil at the

permanent wilting point. Commonly expressed as inches of water per inch depth of soil.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

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

Loose. Noncoherent; soil will not hold together in a mass.

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

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

Plastic. When wet, soil is readily deformed by moderate pressure but can be pressed into a lump; forms a wire when rolled between thumb and forefinger.

Sticky. When wet, soil adheres to other material; tends to stretch somewhat and pull apart, rather than pull free from other material.

Hard. When dry, soil moderately resists pressure; can be broken with difficulty between thumb and forefinger.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Green-manure crop. A crop grown for the purpose of being turned under in an early stage of maturity or soon after maturity for soil improvement.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. The relative position of the several soil horizons in a typical soil profile, and their nomenclature, are as follows:

A0 Organic debris, partly decomposed or matted.

A1 A dark-colored horizon having a fairly high content of organic matter mixed with mineral matter.

A2 A light-colored horizon, often representing the zone of maximum leaching where podzolized; absent in wet, dark-colored soils.

A3 Transitional to B horizon but more like A than B; sometimes absent.

B1 Transitional to B horizon but more like B than A; sometimes absent.

B2 A usually darker colored horizon, which often represents the zone of maximum illuviation where podzolized.

B3 Transitional to C horizon.

C Slightly weathered parent material; absent in some soils.

D Underlying substratum.

The A horizons make up a zone of eluviation, or leached zone. The B horizons make up a zone of illuviation, in which clay and other materials have accumulated. The A and B horizons, taken together, are called the solum, or true soil.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. It may be limited either by the infiltration capacity of the soil or by the rate at which water is applied to the surface soil.

Internal soil drainage. The downward movement of water through the soil profile. The rate of movement is determined by the texture, structure, and other characteristics of the soil profile and underlying layers, and by the height of the water table, either permanent or perched. Relative terms for expressing internal drainage are none, very slow, slow, medium, rapid, and very rapid.

Mottling. Soil is irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of 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 these: fine, less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; medium, ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and coarse, more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Natural drainage. Moisture conditions that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or by the blocking of drainage outlets. Seven different classes of natural drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low water-holding capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and the C horizons.

Imperfectly or somewhat poorly drained soils are wet for significant periods but not all the time, and in podzolic soils commonly have mottlings below 6 to 16 inches.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, though mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or

without mottling, in the deeper parts of the profile.

Normal soil. A soil that has a profile in near equilibrium with its environment and that developed under good but not excessive drainage from parent material of mixed mineral, physical, and chemical composition. Its characteristics show the full effects of the forces of climate and living matter.

Parent material (soil). The horizon of weathered rock or partly weathered soil material from which soil has formed; horizon C in the soil profile.

Permeability, soil. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are as follows: very slow, slow, moderately slow, moderate, moderately rapid, rapid, and very rapid.

Phase, soil. A subdivision of a soil type, series, or other unit in the soil classification system made because of differences in the soil that affect its management but do not affect its classification in the natural landscape. A soil type, for example, may be divided into phases because of differences in slope, stoniness, thickness, or some other characteristic that affects management.

Poorly graded sand (engineering). Sand that is predominantly of one size or that contains only a small amount of material in one or more size ranges.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material. (See Horizon, soil.)

Reaction, soil. The degree of acidity or alkalinity of a soil is expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. In words the degrees of acidity or alkalinity are expressed thus:

	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.

Runoff (hydraulics). The part of the precipitation upon a drainage area that is discharged from the area in stream channels. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. Individual rock or mineral fragments that have diameters ranging from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Series, soil. A group of soils developed from a particular type of parent material and having genetic horizons that, except for texture of the surface soil, are similar in differentiating characteristics and in arrangement in the profile.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are platy, (laminated), prismatic, (vertical axis of aggregates longer than horizontal), columnar (prisms with rounded tops), blocky (angular or subangular), and granular. Structureless soils are (1) single grain (each grain by itself, as in dune sand) or (2) massive (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

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

Substratum. Any layer lying beneath the solum, or true soil; the C or D horizon.

Surface layer. A term used in nontechnical soil descriptions for one or more layers above the subsoil. Includes A horizon and, in places, part of B horizon; has no depth limit.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. (See also Clay, Sand, and Silt.) The basic textural classes, in order of increasing proportions 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."

Topsoil. A presumed fertile soil or soil material that ordinarily is rich in organic matter and is used to topdress roadbanks, lawns, and gardens.

Type, soil. A subdivision of the soil series that is made on the basis of differences in the texture of the surface layer.

Upland (geology). Land consisting of material unworked by water in recent geologic time and lying, in general, at a higher elevation than the alluvial plain or stream terrace. Land above the lowlands along rivers.

Water-holding capacity. (See Available moisture capacity.)

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