United States
Department of
Agriculture

Soil
Conservation
Service

In cooperation with
University of Georgia,
College of Agriculture,
Agricultural Experiment Stations

Soil Survey of Worth County, Georgia

How To Use This Soil Survey

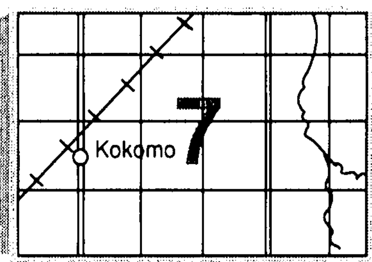
General Soil Map

The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

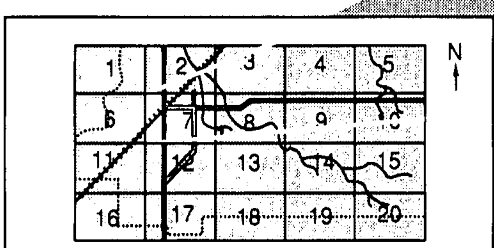
Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.



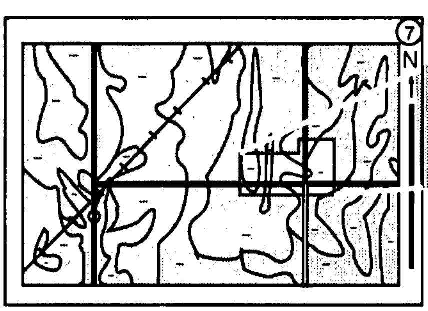
MAP SHEET

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.

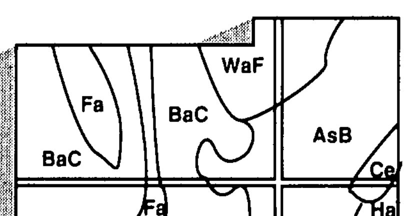


INDEX TO MAP SHEETS

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



MAP SHEET



AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1984. Soil names and descriptions were approved in 1985. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1985. This soil survey was made cooperatively by the Soil Conservation Service and the University of Georgia, College of Agriculture, Agricultural Experiment Stations. It is part of the technical assistance furnished to the Middle South Georgia Soil and Water Conservation District.

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

This survey supercedes the Worth County soil survey *(11)* published in 1929.

All programs and services of the Soil Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

Cover: Peanuts on Tifton loamy sand, 2 to 5 percent slopes. Much of the acreage in Worth County is used for field crops. Farming on the contour is effective in reducing runoff and in controlling erosion.

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Soil Series

Issued April 1990

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Foreword

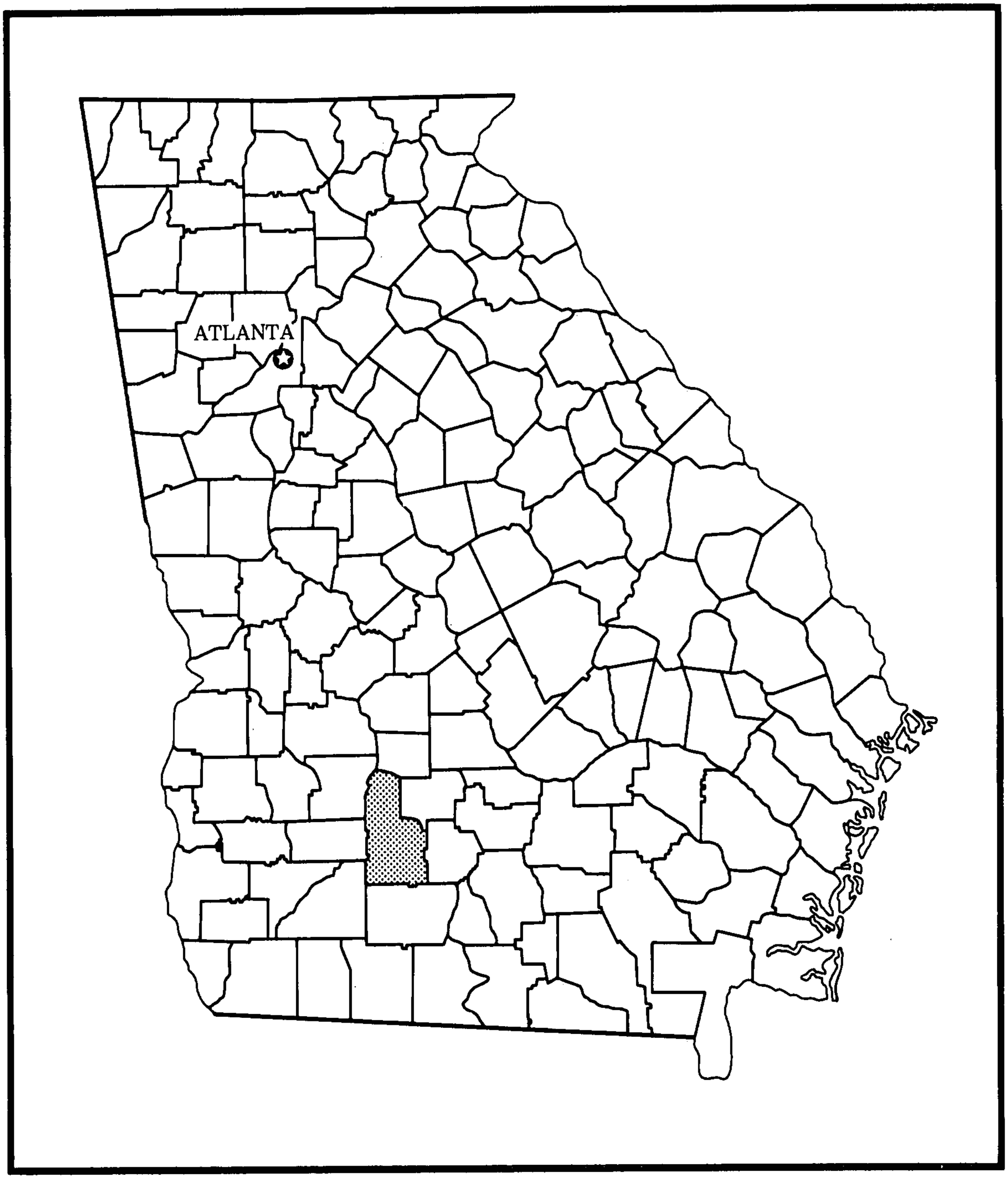
This soil survey contains information that can be used in land-planning programs in Worth County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of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

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

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

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

Hershel R. Read
State Conservationist
Soil Conservation Service



Location of Worth County in Georgia.

Soil Survey of
Worth County, Georgia

By Howard T. Stoner, Soil Conservation Service

Soils surveyed by Howard T. Stoner, Winfield S. Carson, and
John W. Calhoun, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service
In cooperation with
University of Georgia, College of Agriculture,
Agricultural Experiment Stations

WORTH COUNTY is in the southwest part of Georgia. It has a land area of 579 square miles, or 370,560 acres. Sylvester, the county seat, is in the center of the county. In 1980, Worth County had a population of nearly 18,000. About 66 percent of the population is in the rural areas.

Worth County is in the Southern Coastal Plain Major Land Resource Area. It is physiographically about equally divided from the southwest to the northeast by the Pelham Escarpment. To the northwest of the escarpment is the Dougherty Plain District and to the southeast is the Tifton Upland District. Major creeks in the Dougherty Plain District are Abrams Creek, Dry Creek, Jones Creek, Little Abrams Creek, Mill Creek, Pine Creek, and Swift Creek. They generally flow to the west into the Flint River. Major creeks or rivers in the Tifton Upland District are Daniel Creek, Horse Creek, Ochlockonee River, Tucker Creek, Ty Ty Creek, and Warrior Creek. They generally flow to the southeast into the Little River.

The soils on the uplands of the Dougherty Plain District and the Tifton Upland District are mainly nearly level to gently sloping and well drained. Those in the broad, smooth, even areas, in depressions, and in drainageways are nearly level and poorly drained. The well drained soils have a sandy surface layer or a sandy surface layer and subsurface layer and a loamy subsoil. The poorly drained soils have a sandy surface layer and subsurface layer and a loamy subsoil. The soils on the uplands of the Pelham Escarpment are mainly very gently sloping to strongly sloping and well drained. They have a sandy surface layer and a clayey subsoil. The soils on the flood plains are nearly level and poorly drained. These soils are mainly loamy.

The soils on the uplands in the Dougherty Plain District and the Tifton Upland District are used mainly for field crops; but in a few areas, these soils are used as woodland and pasture. The remaining soils in Worth County are mainly in woodland.

General Nature of the County

This section gives general information about the climate, settlement, water resources, and farming in Worth County.

Climate

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

Table 1 gives data on temperature and precipitation for the survey area as recorded at Moultrie, Georgia, in the period 1951 to 1981. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 52 degrees F, and the average daily minimum temperature is 40 degrees. The lowest temperature on record, which occurred at Moultrie on December 13, 1962, is 8 degrees. In summer the average temperature is 80 degrees, and the average daily maximum temperature is

91 degrees. The highest recorded temperature, which occurred on July 16, 1951, is 104 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total average annual precipitation is 50.15 inches. Of this, 28 inches, or 55 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 22 inches. The heaviest 1-day rainfall during the period of record was 6.45 inches at Moultrie on December 4, 1964. Thunderstorms occur on about 57 days each year, and most occur in summer.

The average seasonal snowfall is less than 1 inch. The greatest snow depth at any one time during the period of record was 2 inches.

The average relative humidity in midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 65 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the northwest. Average windspeed is highest, 8 miles per hour, in spring.

Settlement

Worth County was established by an act of the General Assembly of Georgia on December 20, 1853. This county was formed from parts of Dooly and Irwin Counties and was named in honor of Major General William J. Worth. Of Georgia's 159 counties, Worth County was the 105th county to be organized. Sylvester, the county seat, was incorporated December 21, 1898.

Worth County is used mainly for agriculture. Farming in conjunction with the associated agriculture-related enterprises is the chief industry. Though the total acres of peanuts grown each year varies, Worth County is very competitive with other Georgia counties in seeking the title "Peanut Capital of the World." The county has ground transportation routes to local and out-of-State markets.

Water Resources

The Flint and Ochlockonee Rivers, Lake Blackshear, Abrams Creek, Daniel Creek, Dry Creek, Horse Creek, Jones Creek, Mill Creek, Pine Woods Creek, Swift Creek, Tucker Creek, Ty Ty Creek, and Warrior Creek provide water to Worth County. Also, the many ponds in the southeastern part of the county, in addition to those in the rest of the county, are used for watering livestock, for irrigation, and for recreation.

Wells, 10 to 12 inches in diameter and drilled into deep aquifers, produce abundant water. In addition to the regular uses, they provide water for irrigation. These wells are 200 to 700 feet deep. Most wells produce between 250 and 600 gallons per minute.

Farming

Subsistence crops grown by the early settlers in Worth County were mainly corn, oats, rye, and wheat. Cattle and hogs grazed the open woods. After the War Between the States, the farmers urgently needed a cash crop to rebuild their farming operation. Cotton was selected and was the main crop until about 1916. At that time, the boll weevil caused serious problems in cotton production. After about 1916, corn and peanuts replaced cotton in the cropping system. Currently, corn, soybeans, small grains, peanuts, and pecans are the main crops in the county.

Soil erosion and low soil fertility have been the most important concerns in management on farmland in Worth County over the years. In the early 1900's, farming became more intense and tenant-type farming was widespread. This led to misuse of the land, and soil erosion increased dramatically. Changes in land ownership were common, and soil fertility was not maintained in most places. The economic depression in the early 1920's marked the climax of man's assault on the land.

Conservationists noted a definite need to protect the land against depletion. The enactment of soil conservation district legislation in 1937 by the State of Georgia was supported by the leading farmers of Worth County. The Middle South Georgia Soil and Water Conservation District was organized on March 16, 1939. Worth County was one of the six original counties included in the district. Farmers in Worth County recognized the need for soil conservation to prevent soil erosion and to improve or maintain soil fertility. They began using terraces, grassed waterways, improved pastures, and ponds to control erosion and increase productivity. They used the soil according to its capability and treated it in accordance with the needs of the crop. The soil survey maps made by the Soil Conservation Service became the basis for determining the capability of each soil. Many sloping soils in severely eroded fields that had been cultivated were planted to grass or trees.

In the 1960's and early 1970's, public concern about the productive capacity of American agriculture prompted a national inventory of important farmlands. The best land in Worth County available for producing food, feed, forage, fiber, and oilseed crops is identified in the section "Important Farmland."

In 1982, farms covered 196,673 acres, or 53 percent of Worth County.

Many of the soils are well suited to sprinkler irrigation. The amount of land under irrigation in 1984 was about

8,000 acres in Worth County. Most of the irrigated land is used for corn, peanuts, and soybeans.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material from which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

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

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

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, acidity, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

Map Unit Composition

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

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

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

General Soil Map Units

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

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

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

The soils in the survey area vary widely in their suitability for major land uses. In this section, each map unit describes the visual elements of landform, water, vegetation or land use, and structures. The map units are classified as having a low or moderate degree of visual diversity. This is a value rating of landscape elements and their pattern within a frame of reference developed for a local geographic area. Visual diversity can be used in conservation planning and in establishing a desirable continuity of landscape elements. The extent of the map units and their components are identified and described. The main concerns in management are specified, and the soil properties that limit use are indicated. Suitability or the degree of limitation is given for the common uses.

Nearly Level Soils on the Flood Plains

The two general soil map units in this group are made up of poorly drained soils on the flood plains. The slope is 0 to 2 percent. These soils are loamy and are mainly in shades of gray. The underlying material generally is mottled.

1. Herod

Poorly drained, loamy soils that are medium acid to neutral

The landscape is characterized by nearly level, poorly drained soils that are mainly on the flood plains of Jones, Abrams, and Swift Creeks in the northern part of Worth County. These soils are in areas about 600 to 1,500 feet wide. The slope is 0 to 2 percent. The drainage system is well formed and extends generally northwest to the Flint River. Flooding is frequent from late in the fall to midspring. Some of the natural watercourses are perennial because of springs. The soils in this map unit are in woodland that consists mostly of sweetgum, blackgum, cypress, bay, poplar, and water oak. Development of the areas is slight except for roads and utility lines. The degree of visual diversity is low.

This map unit makes up about 1 percent of the county. It is about 95 percent Herod soils and about 5 percent soils of minor extent.

Typically, the upper part of the surface layer is very dark gray sandy loam about 3 inches thick. The lower part, to a depth of 10 inches, is grayish brown sandy loam. The underlying material to a depth of 60 inches or more is gray sandy clay loam that has yellowish or brownish mottles and thin strata of sand.

The soils of minor extent in this map unit are mainly sandy. These unnamed soils are poorly drained and are in small, narrow bands next to the stream channels.

Wetness and flooding are the main concerns in management. The soils in this map unit are well suited to the commonly grown pine tree, but they are poorly suited to field crops, hay, and pasture. These soils have severe limitations for nonfarm uses.

2. Kinston

Poorly drained, loamy soils that are very strongly acid or strongly acid

The landscape is characterized by nearly level, poorly drained soils that are on the flood plains of Branch, Horse, Warrior, and Ty Ty Creeks in the southern part of Worth County. These soils are in areas about 600 to 1,500 feet wide. The slope is 0 to 2 percent. The drainage system is well formed and extends generally southeast to Colquitt and Tift Counties. Flooding is frequent from late in the fall to early in the spring. Most of the streams are perennial. The soils in this map unit mostly are in woodland that consist mainly of sweetgum, blackgum, cypress, bay, poplar, and water oak. Development of the areas is slight except for roads and utility lines. The degree of visual diversity is low.

This map unit makes up about 5 percent of the county. It is about 63 percent Kinston soils and about 37 percent soils of minor extent.

Typically, the surface layer is fine sandy loam about 12 inches thick. The upper part of the surface layer is very dark grayish brown, and the lower part is dark grayish brown. The underlying material extends to a depth of 66 inches or more. The upper part of the underlying material is mainly gray sandy loam. The middle part is gray and light gray sandy clay loam that has brown and yellow mottles. The lower part is light gray sand that has mottles in shades of yellow.

The soils of minor extent in this map unit are Hornsville, Pelham, and Wahee soils. Hornsville soils are moderately well drained and are on stream terraces in slightly higher positions on the landscape than Kinston soils. Pelham and Wahee soils are on the nearly level landscape with Kinston soils. Wahee soils are somewhat poorly drained. Also included are some unnamed soils that are poorly drained but are sandy throughout. These soils also are on the nearly level landscape with the Kinston soils.

Wetness and flooding are the main concerns in management. The soils in this map unit are well suited to the commonly grown pine tree, but they are poorly suited to field crops, hay, and pasture. These soils have severe limitations for nonfarm uses.

Nearly Level to Gently Sloping Soils on the Uplands

The four general soil map units in this group are made up of excessively drained to poorly drained soils that have slope of 0 to 8 percent. The excessively drained soils are on ridgetops. They are sandy throughout in shades of brown. The well drained soils are on ridgetops and hillsides. They have a brownish, sandy surface layer and a brownish or reddish, loamy subsoil that generally is mottled in the lower part, or these soils have a brownish sandy surface layer and a thick subsurface layer and a brownish or yellowish loamy subsoil that generally is mottled in the lower part. The moderately well drained soils are in smooth areas and have a brownish sandy surface layer and a thick subsurface layer and a yellowish loamy subsoil that is mottled in the lower part. The poorly drained soils are in smooth, even areas and near drainageways and are mainly sandy and loamy in shades of gray.

3. Tifton-Fuquay-Stilson

Well drained and moderately well drained soils that have a sandy surface layer or have a sandy surface layer, a thick, sandy subsurface layer, and a loamy subsoil; on ridgetops and hillsides or in smooth areas

The landscape is characterized by nearly level to gently sloping, well drained soils on ridgetops and hillsides and by nearly level, moderately well drained soils in smooth areas on the uplands. The slope is 0 to 8 percent. These soils are in the northern part of Worth County. The excess surface water drains into a system of intermittent streams. Open water areas are few. The soils in this map unit are mainly used for farming; but, in many areas, they are in woodland. Roads, utility lines, fences, and farm houses and associated structures are common. The degree of visual diversity is moderate.

This map unit makes up about 10 percent of the county. It is about 32 percent Tifton soils, about 21 percent Fuquay soils, about 19 percent Stilson soils, and about 28 percent soils of minor extent.

Tifton soils are well drained, have a sandy surface layer, and are on ridgetops and hillsides. Typically, the surface layer is dark grayish brown loamy sand about 10 inches thick. The subsoil extends to a depth of 80 inches or more. The upper part of the subsoil is yellowish brown sandy loam. The lower part is yellowish brown sandy clay loam that has strong brown, yellowish brown, red, light gray, and yellowish red mottles. Plinthite is 5 percent or more below a depth of about 42 inches. Nodules of ironstone are on the surface layer and in the upper part of the subsoil.

Fuquay soils are well drained and have a sandy surface layer and a thick, sandy subsurface layer. These soils are on ridgetops and hillsides. Typically, the surface layer is grayish brown loamy sand about 8 inches thick. The subsurface layer, to a depth of 26 inches, is light yellowish brown loamy sand. The subsoil extends to a depth of 80 inches or more. The upper part of the subsoil is yellowish brown sandy loam. The next layer is yellowish brown sandy clay loam. The next layer is yellowish brown sandy clay loam that has red and light gray mottles. The lower part is mottled brownish yellow, red, light gray, and yellowish red sandy clay loam. Plinthite is 5 percent or more below a depth of 48 inches. This soil contains a few nodules of ironstone to a depth of 48 inches.

Stilson soils are moderately well drained and have a sandy surface layer and a thick sandy subsurface layer. These soils are in smooth areas on the uplands. Typically, the surface layer is dark grayish brown loamy sand about 8 inches thick. The subsurface layer, to a depth of 25 inches, is light yellowish brown loamy sand. The subsoil extends to a depth of 80 inches or more. The upper few inches of the subsoil are light yellowish brown sandy loam. The lower part is brownish yellow sandy clay loam that has yellowish brown, light brownish gray, light gray, yellowish red, and strong brown mottles. Plinthite is 5 percent or more below a depth of about 45 inches.

The soils of minor extent in this map unit are Coxville, Leefield, Norfolk, Ocilla, and Pelham soils. Coxville soils are poorly drained and are in depressions. Leefield and Ocilla soils are somewhat poorly drained but are in smooth areas on the uplands. Norfolk soils are well drained and are on ridgetops with Tifton and Fuquay soils. Pelham soils are poorly drained and are in broad, smooth, even areas on the uplands.

There are two main concerns in management: erosion on the very gently sloping and gently sloping soils that have a sandy surface layer; and the low available water capacity of well drained soils that have a sandy surface layer and a thick, sandy subsurface layer. Wetness is a concern in management for soils in smooth areas. The soils in this map unit that are on ridgetops and hillsides are well suited to most uses, but the low available water capacity is a limitation for agricultural use of soils that have a sandy surface layer and a thick, sandy subsurface layer. The soils in smooth areas are only moderately suited to most uses because of wetness, but they are well suited to the commonly grown pine tree.

4. Tifton-Pelham

Well drained and poorly drained soils that have a sandy surface layer or have a sandy surface layer, a thick, sandy subsurface layer, and a loamy subsoil; on ridgetops and hillsides or in broad, smooth areas and in drainageways

The landscape is characterized by nearly level to gently sloping, well drained soils on ridgetops and hillsides and by nearly level, poorly drained soils in broad, smooth areas and in drainageways on the uplands. The slope is 0 to 8 percent. These soils are throughout most of Worth County. The excess surface water drains into a system of intermittent streams. Open water areas are common. The soils on the ridgetops and hillsides in this map unit are used mainly for farming. The soils in broad, smooth areas and in drainageways are in unmanaged woodland. Roads, utility lines, fences, and farm houses and associated structures are common. The degree of visual diversity is moderate.

This map unit makes up about 66 percent of the county. It is about 41 percent Tifton soils, about 15 percent Pelham soils, and about 44 percent soils of minor extent.

Tifton soils are well drained. Typically, the surface layer is dark grayish brown loamy sand about 10 inches thick. The subsoil extends to a depth of 80 inches or more. The upper part of the subsoil is yellowish brown sandy loam. The lower part is yellowish brown sandy clay loam that has strong brown, yellowish brown, red, light gray, and yellowish red mottles. Plinthite is 5 percent or more below a depth of about 42 inches. Nodules of ironstone are on the surface layer and in the upper part of the subsoil.

Pelham soils are poorly drained. Typically, the surface layer is dark grayish brown loamy sand about 4 inches thick. The subsurface layer, to a depth of 21 inches, is light brownish gray loamy sand. The subsoil to a depth of 65 inches or more is mainly light gray sandy clay loam.

The soils of minor extent in this map unit are Carnegie, Clarendon, Cowarts, Coxville, Dothan, Freemanville, Fuquay, Lakeland, Leefield, Ocilla, and Stilson soils. Carnegie, Cowarts, Dothan, Freemanville, and Fuquay soils are well drained and are on ridgetops and hillsides with the major soils in this map unit. Clarendon and Stilson soils are moderately well drained and are in broad, smooth areas. Coxville soils are poorly drained and are in depressions. Lakeland soils are excessively drained and are on ridgetops and hillsides with the major soils in this map unit. Leefield and Ocilla soils are somewhat poorly drained and are in broad, smooth areas.

There are two main concerns in management: erosion on the very gently sloping soils on ridgetops and hillsides; and wetness and flooding of the nearly level soils near drainageways. The soils in this map unit that are on ridgetops and hillsides are well suited to most uses. The soils near drainageways that are seasonally wet and, in most places, that are occasionally flooded have severe limitations for most uses, but they are well suited to the commonly grown pine tree.

5. Fuquay-Cowarts-Pelham

Well drained and poorly drained soils that have a sandy surface layer and a thick, sandy subsurface layer or have a sandy surface layer and a loamy subsoil; on ridgetops and hillsides or in broad, smooth areas and in drainageways

The landscape is characterized by nearly level to gently sloping, well drained soils on ridgetops and hillsides and by nearly level, poorly drained soils in broad, smooth areas and in drainageways on the uplands. The slope is 0 to 8 percent. These soils are in the southeastern part of Worth County. The excess surface water drains into a system of intermittent streams. Open water areas are common. The soils in this map unit that are on ridgetops and hillsides are used mainly for tree farming. The soils in broad, smooth areas and in drainageways are in unmanaged woodland. Roads, utility lines, fences, farm houses and associated structures are few. The degree of visual diversity is low.

This map unit makes up about 3 percent of the county. It is about 36 percent Fuquay soils, about 22 percent Cowarts soils, about 15 percent Pelham soils, and about 27 percent soils of minor extent.

Fuquay soils are well drained and have a sandy surface layer and a thick subsurface layer. These soils are on ridgetops and hillsides. Typically, the surface layer is grayish brown loamy sand about 8 inches thick. The subsurface layer, to a depth of 26 inches, is light yellowish brown loamy sand. The subsoil extends to a depth of 80 inches or more. The upper part of the subsoil is yellowish brown sandy loam. The next layer is yellowish brown sandy clay loam. The next layer is yellowish brown sandy clay loam that has red and light gray mottles. The lower part is mottled brownish yellow, red, light gray, and yellowish red sandy clay loam. Plinthite is 5 percent or more below a depth of 48 inches. This soil has a few nodules of ironstone to a depth of 48 inches.

Cowarts soils are well drained, have a sandy surface layer, and are on ridgetops and hillsides. Typically, the surface layer is dark grayish brown loamy sand about 7 inches thick. The subsurface layer, to a depth of 10 inches, is yellowish brown loamy sand. The subsoil is sandy clay loam and extends to a depth of 36 inches. The upper part is strong brown sandy clay loam. The lower part is yellowish brown. The substratum to a depth of 65 inches or more is extremely firm and compact. It is mottled yellowish brown, red, brownish yellow, and light gray sandy clay loam that has coarse, sandy loam strata.

Pelham soils are poorly drained and have a sandy surface layer and a thick subsurface layer. These soils are mainly near drainageways. Typically, the surface layer is dark grayish brown loamy sand about 4 inches thick. The subsurface layer, to a depth of 21 inches, is light brownish gray loamy sand. The subsoil to a depth of 65 inches or more is mainly light gray sandy clay loam.

The soils of minor extent in this map unit are Leefield, Stilson, and Tifton soils. Leefield soils are somewhat poorly drained and are in broad, smooth, even areas. Stilson soils are moderately well drained and are in broad, smooth, even areas. Tifton soils are well drained and are on ridgetops and hillsides with Fuquay and Cowarts soils.

There are three main concerns in management: erosion on the very gently sloping or gently sloping soils that have a sandy surface layer; the low available water capacity of well drained soils that have a sandy surface layer and a thick, sandy subsurface layer; and wetness and flooding of the nearly level soils near drainageways. The soils in this map unit that are on ridgetops and hillsides are well suited to most uses, but the low available water capacity is a limitation for agricultural uses of soils that have a sandy surface layer and a thick, sandy subsurface layer. The soils near drainageways are poorly suited to most uses because of wetness, but they are well suited to the commonly grown pine tree.

6. Lakeland-Wagram-Orangeburg

Excessively drained and well drained soils that are sandy throughout or have a sandy surface layer and a thick, sandy subsurface layer or a sandy surface layer and a loamy subsoil; on ridgetops and hillsides

The landscape is characterized by nearly level to gently sloping, excessively drained and well drained soils on ridgetops and hillsides. These soils are in the northwestern part of Worth County. The slope is 0 to 8 percent. The excess surface water drains into a system of poorly defined intermittent streams. These streams meander into the larger creeks and into Flint River. Open water areas are few. The soils in this map unit are mainly in woodland; but, in a few areas, they are used for farming. Structures made by man are few. The degree of visual diversity is low.

This map unit makes up about 5 percent of the county. It is about 26 percent Lakeland soils, about 24 percent Wagram soils, about 20 percent Orangeburg soils, and about 30 percent soils of minor extent.

Lakeland soils are excessively drained and are sandy throughout. Typically, the surface layer is dark brown and about 6 inches thick. The underlying material extends to a depth of 80 inches or more. The upper part of the underlying material is yellowish brown. The middle part is light yellowish brown. The lower part is pale brown.

Wagram soils are well drained and have a sandy surface layer and a thick subsurface layer. Typically, the surface layer is brown, loamy sand about 8 inches thick. The subsurface layer, to a depth of 30 inches, is light yellowish brown loamy sand. The subsoil extends to a depth of 96 inches or more. The upper few inches of the subsoil are brownish yellow sandy loam. The lower part is mainly yellowish brown sandy clay loam.

Orangeburg soils are well drained and have a sandy surface layer. Typically, the surface layer is brown loamy sand about 8 inches thick. The subsoil extends to a depth of 72 inches or more. The upper few inches of the subsoil is yellowish red sandy loam. The lower part is red sandy clay loam.

The soils of minor extent in this map unit are Hornsville, Lucy, Pelham, Red Bay, and Wahee soils. Hornsville soils are moderately well drained and are on stream terraces. Lucy and Red Bay soils are well drained and are on ridgetops and hillsides with the major soils in this map unit. Pelham soils are poorly drained and are in smooth, even areas and near drainageways. Wahee soils are somewhat poorly drained and are on stream terraces.

There are two main concerns in management: the low available water capacity of soils that are sandy throughout or that have a sandy surface layer and a thick, sandy subsurface layer; and erosion on the very gently sloping and gently sloping soils that have a sandy surface layer. The soils in this map unit are well suited to most uses, but the low available water capacity is a limitation for agricultural uses of soils that are sandy throughout or that have a sandy surface layer and a thick, sandy subsurface layer.

Very Gently Sloping to Strongly Sloping Soils on the Uplands

The one general soil map unit in this group is made up of well drained and somewhat poorly drained soils on ridgetops and hillsides. The slope is 2 to 12 percent. These soils have a brownish sandy surface layer and a yellowish, brownish, or reddish clayey or loamy subsoil that generally is mottled.

7. Esto-Cowarts-Susquehanna

Well drained and somewhat poorly drained soils that have a sandy surface layer and a clayey or loamy subsoil; on ridgetops and hillsides

The landscape is characterized by very gently sloping to strongly sloping soils on ridgetops and hillsides. These soils extend as a band that is as much as 6 miles wide from the southwestern corner of Worth County northeast to Turner County. The slope is 2 to 12 percent. The excess surface water drains westerly into a system of intermittent streams that flow into the Flint River. Open water areas are common (fig.1). The soils in this map unit are used mainly for tree farming. Roads, utility lines, fences, farm houses and associated structures are few. The degree of visual diversity is low.

This map unit makes up about 10 percent of the county. It is about 29 percent Esto soils, about 24 percent Cowarts soils, about 13 percent Susquehanna soils, and about 34 percent soils of minor extent.

Esto soils are well drained and have a clayey subsoil. Typically, the surface layer is dark grayish brown loamy sand about 7 inches thick. The subsoil is mainly sandy clay and extends to a depth of 65 inches or more. The upper part of the subsoil is brownish yellow. The middle part is brownish yellow and strong brown and has red and gray mottles. The lower part is mottled in shades of red, brown, yellow, and gray. A few nodules of ironstone are in the surface layer.

Cowarts soils are well drained and have a loamy subsoil. Typically, the surface layer is brown loamy sand about 7 inches thick. The subsoil extends to a depth of 26 inches. The upper part of the subsoil is strong brown sandy loam. The lower part is yellowish red sandy clay loam that has mottles in shades of brown and red. The substratum to a depth of 62 inches or more is extremely

Figure 1.—An established pond on Esto-Susquehanna loamy sands, 5 to 12 percent slopes. The pond is used for watering livestock and for recreation.

firm and compact in place. It is mottled and streaked yellowish brown, light gray, red, and strong brown sandy clay loam that has pockets of sandy loam.

Susquehanna soils are somewhat poorly drained and have a clayey subsoil. Typically, the surface layer is dark grayish brown loamy sand about 5 inches thick. The subsoil extends to a depth of 65 inches or more. The upper part of the subsoil is yellowish red clay that has strong brown and light gray mottles. The lower part is clay mottled in shades of gray, brown, and red.

The soils of minor extent in this map unit are Carnegie, Coxville, Pelham, and Tifton soils. Carnegie and Tifton soils are well drained and are on the ridgetops and hillsides with the major soils in this map unit. Coxville soils are poorly drained and are in depressions. Pelham soils are poorly drained and are in smooth, even areas and near drainageways.

Erosion is the main concern in management. In addition, the shrink-swell potential of the soils in this map unit generally is a concern in management for nonfarm uses. In most places, these soils are only moderately suited to most uses.

Broad Land Use Consideration

Considerable acreage in Worth County is being used as cropland, pasture, and woodland. The general soil map can be used for broad planning, but it cannot be used to locate the site for a specific structure. In general, the soils in Worth County that are well suited to cultivated crops also are well suited to urban development. Their excellence as farmland should not be overlooked in planning. The data about specific soils can be helpful in planning future land use patterns.

Many of the soils on the uplands in Worth County are used for and are well suited to cultivated crops and pasture. Most of the soils are nearly level to gently sloping and are well drained or are nearly level and moderately well drained. Some of the soils have a low available water capacity, a severe hazard of erosion, strong slopes, very slow to moderately slow permeability, or a seasonal high water table. These soils are only moderately suited to or poorly suited to farming. Most of the soils on the flood plains are poorly drained and are used as woodland. They are poorly suited to farming.

Some acreage in Worth County is used as woodland. The potential of these soils for woodland productivity is mainly moderate or high.

About two-thirds of the soils in Worth County are on ridgetops and hillsides on the uplands. Most of the soils are well drained, and they are well suited to nonfarm use; however, about 5 percent of the well drained soils are on the escarpments and are less suited to nonfarm use. The remainder of the soils in the county are on the flood plains and stream terraces and in depressions and smooth, nearly level areas on the uplands. These soils are not as well drained as the soils on the ridgetops and hillsides, are seasonally wet, and are only moderately suited to or poorly suited to nonfarm use.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. A soil is well suited to a use if it has properties that are favorable. It is moderately suited to a use if it has properties that require special planning and management to obtain satisfactory performance. It is poorly suited to a use if it has properties that are unfavorable. A soil is not suited to a particular use if it has properties or limitations that are so unfavorable that they are impractical to remove. More information on each map unit, or soil, is given under "Use and Management of the Soils."

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

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

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

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases.* Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Tifton loamy sand, 2 to 5 percent slopes, is one of several phases in the Tifton series.

Some map units are made up of two or more major soils. These map units are called soil complexes.

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Esto-Susquehanna loamy sands, 2 to 5 percent slopes, complex is an example.

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

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

AoA—Albany sand, 0 to 2 percent slopes. This soil is nearly level and somewhat poorly drained. It generally is in smooth areas on the uplands. The mapped areas are 5 to 30 acres.

Typically, the surface layer is dark gray sand about 6 inches thick. The subsurface layer, to a depth of 53 inches, is light yellowish brown sand that has yellowish brown and light gray mottles. The upper part of the subsoil, to a depth of 64 inches, is mottled pale brown, light gray, and yellowish brown sandy loam. The lower part to a depth of 80 inches or more is mottled light yellowish brown, light gray, and yellowish brown sandy clay loam.

This soil is low in natural fertility and organic matter. The reaction of the soil is very strongly acid or strongly acid except in areas where the surface layer has been limed. The permeability is rapid in the surface layer and in the thick subsurface layer, and it is moderate in the subsoil. The available water capacity is very low. Soil tilth is good. This soil is easily tilled within a wide range of moisture content. Except late in the fall to early in the spring when the seasonal high water table is at a depth of 1.5 to 2.5 feet, the root zone is normally deep.

Included with this soil in mapping are small areas of Lakeland, Ocilla, and Pelham soils. Also included are some soils that are sandy throughout and some soils that have a subsoil of sandy clay loam at a depth of less than 40 inches.

This Albany soil is only moderately suited to field crops, hay, and pasture because of wetness. This limitation can be overcome if a drainage system is installed and maintained. Also, the very low available water capacity limits yields. Returning crop residue to the soil helps retain moisture.

The potential of this soil for production of loblolly pine and slash pine is high. The equipment use limitation and seedling mortality are concerns in management. However, seasonal wetness limits the use of conventional equipment on this soil and increases seedling mortality. The equipment use limitation generally can be overcome by using modified or special implements or by scheduling planting and harvesting operations during dry periods. Proper drainage and the use of adapted plants generally increase the rate of seedling survival.

This soil is poorly suited to most urban use because of wetness. A drainage system is needed to reduce the wetness limitation and to improve the soil's suitability for urban development.

This soil is poorly suited to recreational development because it is too sandy and because it is wet during the winter and early in the spring.

This Albany soil is in capability subclass IIIw. The woodland ordination symbol for this soil is 9W.

CaC—Carnegie sandy loam, 5 to 8 percent slopes. This soil is gently sloping and well drained. It is on hillsides on the uplands. Because of deep tillage, the sandy loam surface layer has mixed with material from the upper part of the subsoil. In most places, the slopes are short and complex. The mapped areas are 8 to 40 acres.

Typically, the surface layer is brown sandy loam about 6 inches thick. The subsoil extends to a depth of 65 inches or more. The upper part of the subsoil is yellowish red sandy clay loam. The lower part is yellowish red sandy clay that is mottled strong brown, red, yellowish red, and light gray. Nodules of ironstone are in the surface layer and the upper part of the subsoil. Plinthite is 5 percent or more below a depth of about 16 inches.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderately slow. The available water capacity is moderate. Runoff is rapid. Soil tilth is good. The effective root zone is limited below a depth of about 16 inches. Plinthite below that depth is not easily penetrated by plant roots.

Included with this soil in mapping are areas of Cowarts and Tifton soils. Also included are some eroded soils that have a sandy clay loam surface layer and have rills, galled spots, and an occasional gully.

This Carnegie soil is only moderately suited to field crops, hay, and pasture because of rapid runoff and short, complex slopes. Good tilth can be maintained by returning crop residue to the soil. Erosion is a severe hazard if this soil is cultivated and not protected. A conservation tillage system or a water management system, or a combination of both, reduces runoff and helps to control erosion.

The potential of this soil for production of loblolly pine and slash pine is high. Although this soil has no significant limitations for woodland use, woodland operations performed on the contour help keep erosion to a minimum.

This soil is well suited to most urban use. However, permeability is moderately slow in the subsoil and limits the use of this soil as septic tank absorption fields. Generally, this permeability limitation can be overcome by special design and proper application to the proposed use.

This soil is only moderately suited to most recreational development because the subsoil is moderately slowly permeable.

This Carnegie soil is in capability subclass IIIe. The woodland ordination symbol for this soil is 9A.

CaD—Carnegie sandy loam, 8 to 12 percent slopes. This soil is strongly sloping and well drained. It is on hillsides on the uplands. Because of deep tillage, the sandy loam surface layer has mixed with material from the upper part of the subsoil. In most places, the slopes are short and complex. The mapped areas are 5 to 15 acres.

Typically, the surface layer is dark grayish brown sandy loam about 5 inches thick. The subsoil extends to a depth of 65 inches or more. The upper part of the subsoil is strong brown sandy clay loam. The middle part is yellowish red sandy clay. The lower part is mottled strong brown, red, yellowish red, and light gray sandy clay. Nodules of ironstone are in the surface layer and the upper part of the subsoil. Plinthite is 5 percent or more below a depth of 22 inches.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid; however, areas in pasture that have been limed are less acid. The permeability is moderately slow. The available water capacity is moderate. Runoff is rapid. Soil tilth is good. The effective root zone is limited below a depth of about 19 inches. Plinthite below that depth is not easily penetrated by plant roots.

Included with this soil in mapping are areas of Cowarts and Tifton soils. Also included are some eroded soils that have a sandy clay loam surface layer and have a few rills, galled spots, and an occasional gully.

This Carnegie soil is poorly suited to field crops because of rapid runoff and short, complex slopes. However, it is moderately suited to hay and pasture. Erosion is a severe hazard if this soil is cultivated and not protected.

The potential of this soil for production of loblolly pine and slash pine is high. Although this soil has no significant limitations for woodland use, woodland operations performed on the contour help keep erosion to a minimum.

This soil is only moderately suited to most urban use and recreational development. Slope is a limitation for these uses. In addition, the permeability is moderately slow in the subsoil and limits the use of this soil as septic tank absorption fields and for recreational development. The slope and permeability limitations generally can be overcome by special design and proper application to the proposed use.

This Carnegie soil is in capability subclass IVe. The woodland ordination symbol for this soil is 9A.

CbB—Carnegie gravelly sandy loam, 3 to 5 percent slopes. This soil is very gently sloping and well drained. It is on ridgetops and hillsides on the uplands. Because of deep tillage, the gravelly sandy loam surface layer has mixed with material from the upper part of the subsoil. The slopes are smooth and convex. The mapped areas are 5 to 30 acres.

Typically. the surface layer is dark brown gravelly sandy loam about 6 inches thick. The upper part of the subsoil, to a depth of 9 inches, is yellowish red sandy clay loam. The next layer, to a depth of 29 inches, is yellowish red sandy clay. The next layer, to a depth of 46 inches, is yellowish red sandy clay that has red, strong brown, and light gray mottles. The lower part of the subsoil to a depth of 70 inches or more is mottled yellowish red sandy clay. Nodules of ironstone are in the surface layer and throughout the upper part of the subsoil. Plinthite is 5 percent or more at a depth of 19 to 29 inches.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderately slow. The available water capacity is moderate. Soil tilth is good. The effective root zone is limited below a depth of about 19 inches. Plinthite below that depth is not easily penetrated by plant roots.

Included with this soil in mapping are areas of Cowarts and Tifton soils. Also included are areas of eroded soils that have a sandy clay loam surface layer.

This Carnegie soil is well suited to field crops, hay, and pasture. Good tilth can be maintained in most places by returning crop residue to the soil. Erosion is a moderate hazard if this soil is cultivated and not protected. A conservation tillage system or a water management system, or a combination of both, reduces runoff and helps to control erosion.

The potential of this soil for production of loblolly pine and slash pine is high. Although this soil has no significant limitations for woodland use, woodland operations performed on the contour help keep soil erosion to a minimum.

This soil is well suited to most urban use. However, permeability is moderately slow in the subsoil and limits the use of this soil as septic tank absorption fields. Generally, this permeability limitation can be overcome by special design and proper application to the proposed use.

This soil is only moderately suited to most recreational development because the subsoil is moderately slowly permeable.

This Carnegie soil is in capability subclass IIe. The woodland ordination symbol for this soil is 9A.

CdA—Clarendon loamy sand, 0 to 2 percent slopes. This soil is nearly level and moderately well drained. It generally is in smooth areas on the uplands near natural ponds and drainageways. The mapped areas are 5 to 30 acres.

Typically, the surface layer is dark grayish brown loamy sand about 8 inches thick. The upper part of the subsoil, to a depth of 13 inches, is light yellowish brown sandy loam. The next layer, to a depth of 24 inches, is yellowish brown sandy clay loam that has strong brown mottles. The next layer, to a depth of 44 inches, is yellowish brown sandy clay loam that has gray, yellowish red, and strong brown mottles. The lower part of the subsoil to a depth of about 65 inches is mottled red, light gray, and yellowish brown sandy clay loam. Plinthite is 5 percent or more below a depth of about 24 inches. Nodules of ironstone are throughout much of this soil.

This soil is low in natural fertility and organic matter. The reaction of the soil is very strongly acid or strongly acid except in areas where the surface layer has been limed. The permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. The available water capacity is moderate. Soil tilth is good. This soil is easily tilled within a wide range of moisture content. Except during the winter and the spring when the water table is at a depth of 1.5 to 2.5 feet, the root zone is normally deep.

Included with this soil in mapping are small areas of Leefield and Stilson soils. Also included are some wet areas that are less than 3 acres. These wet areas are indicated by a wet spot symbol on the map in the back of this publication.

This Clarendon soil is well suited to field crops, hay, and pasture (fig. 2). However, it is somewhat restricted because of wetness, and a drainage system is needed in most places.

The potential of this soil for production of loblolly pine, slash pine, sweetgum, and yellow poplar is high. However, seasonal wetness is a limitation to use of equipment on this soil. This limitation generally can be overcome by using modified or special equipment or by scheduling planting and harvesting operations during dry periods.

This soil is only moderately suited to most urban use and recreational development because of wetness. Permeability is moderately slow in the lower part of the subsoil and limits the use of this soil as septic tank absorption fields. In most places, the wetness and

Figure 2.—Conservation tillage on Clarendon loamy sand, 0 to 2 percent slopes.

permeability limitations can be overcome by special design and proper application to the proposed use.

This Clarendon soil is in capability subclass IIw. The woodland ordination symbol for this soil is 9W.

CoB—Cowarts loamy sand, 2 to 5 percent slopes. This soil is very gently sloping and well drained. It is on ridgetops and hillsides on the uplands. The slopes are undulating and convex. The mapped areas are 5 to 30 acres.

Typically, the surface layer is dark grayish brown loamy sand about 7 inches thick. The subsurface layer, to a depth of 10 inches, is yellowish brown loamy sand. The upper part of the subsoil, to a depth of 26 inches, is strong brown sandy clay loam. The lower part, to a depth of 36 inches, is yellowish brown sandy clay loam. The substratum to a depth of 65 inches or more is extremely firm and compact in place. It is mottled yellowish brown, red, light gray, and brownish yellow sandy clay loam that has coarse sandy loam strata.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderate in the subsoil and slow in the substratum. The available water capacity is low. Soil tilth is good. This soil is easily tilled within a wide range of moisture content. The effective root zone is limited to about the upper 25 to 37 inches of the soil. The substratum is dense and is not easily penetrated by plant roots.

Included with this soil in mapping are areas of Esto soils. Also included are soils that have more clay in the upper part of the subsoil than Cowarts soil, some eroded soils that have a sandy clay loam surface layer, and some wet areas that are less than 3 acres. These wet areas are indicated by a wet spot symbol on the map in the back of this publication.

This Cowarts soil is well suited to field crops, hay, and pasture. However, yields are somewhat reduced because the effective root zone is limited to the upper 25 to 37 inches of the soil. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a moderate hazard if this soil is cultivated and not protected. A conservation tillage system or a water management system, or a combination of both, reduces runoff and helps to control erosion.

The potential of this soil for production of loblolly pine and slash pine is high. Although this soil has no significant limitations for woodland use, woodland operations performed on the contour help keep soil erosion to a minimum.

This soil is well suited to most urban use. However, permeability is moderately slow or slow in the substratum and limits the use of this soil as septic tank absorption fields. Generally, this permeability limitation can be overcome by special design and proper application to the proposed use.

This soil is only moderately suited to most recreational development because the permeability is moderately slow or slow in the substratum.

This Cowarts soil is in capability subclass IIe. The woodland ordination symbol for this soil is 9A.

CoC—Cowarts loamy sand, 5 to 8 percent slopes. This soil is gently sloping and well drained. It is on hillsides on the uplands. Because of deep tillage, the loamy sand surface layer has mixed with material from the upper part of the subsoil. In most places, the slopes are short and complex. The mapped areas are 10 to 50 acres.

Typically, the surface layer is brown loamy sand about 7 inches thick. The subsoil extends to a depth of 26 inches. The upper part of the subsoil is strong brown sandy loam. The lower part is yellowish red sandy clay loam that has brownish and reddish mottles. The substratum to a depth of 62 inches or more is extremely firm and compact in place. It is mottled and streaked yellowish brown, light gray, red, and strong brown sandy clay loam that has pockets of sandy loam.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderate in the subsoil and moderately slow or slow in the substratum. The available water capacity is low. Runoff is rapid. The effective root zone is limited to about the upper 25 to 37 inches of the soil. The substratum is dense and is not easily penetrated by plant roots.

Included with this soil in mapping are areas of Esto soils. Also included are soils that have more clay in the upper part of the subsoil than Cowarts soil and some eroded soils that have a sandy clay loam surface layer.

This Cowarts soil is poorly suited to field crops because of rapid runoff and short and complex slopes. However, it is moderately suited to hay and pasture. Good tilth can be maintained by returning crop residue to the soil. Erosion is a severe hazard if this soil is cultivated and not protected. A conservation tillage system or a water control management system, or a combination of both, reduces runoff and helps to control erosion.

The potential of this soil for production of loblolly pine and slash pine is high. Although this soil has no significant limitations for woodland use, woodland operations performed on the contour help keep soil erosion to a minimum.

This soil is well suited to most urban uses. However, permeability is moderately slow or slow in the substratum and limits the use of this soil as septic tank absorption fields. Generally, this permeability limitation can be overcome by special design and proper application to the proposed use.

This soil is only moderately suited to most recreational development because the permeability is moderately slow or slow in the substratum.

This Cowarts soil is in capability subclass IIIe. The woodland ordination symbol for this soil is 9A.

CoD—Cowarts loamy sand, 8 to 12 percent slopes. This soil is strongly sloping and well drained. It is on hillsides on the uplands. The slopes are short and complex. The mapped areas are 5 to 20 acres.

The surface layer is dark grayish brown loamy sand about 5 inches thick. The subsoil is yellowish brown sandy clay loam, and it extends to a depth of 26 inches. The lower part of the subsoil has red and yellowish red mottles. The substratum to a depth of 62 inches or more is extremely firm and compact in place. It is mottled yellowish brown, light gray, red, and strong brown sandy clay loam that has pockets of sandy loam.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderate in the subsoil and moderately slow or slow in the substratum. The available water capacity is low. Runoff is rapid. The effective root zone is limited to about the upper 20 to 40 inches of the soil. The substratum is dense and is not easily penetrated by plant roots.

Included with this soil in mapping are areas of Carnegie and Esto soils. Also included are some soils that have more clay in the upper part of the subsoil than Cowarts soils and some severely eroded soils that have a sandy clay loam surface layer.

This Cowarts soil is poorly suited to field crops because the soil is strongly sloping. However, it is moderately suited to hay and pasture. Erosion is a severe hazard if this soil is cultivated and not protected.

The potential of this soil for production of loblolly pine and slash pine is high. Although this soil has no significant limitations for woodland use, woodland operations performed on the contour help keep soil erosion to a minimum.

This soil is moderately suited to most urban use and recreational development mainly because of slope. Permeability is moderately slow or slow in the substratum and limits the use of this soil as septic tank absorption fields. Generally, the slope and permeability limitations can be overcome by special design and proper application to the proposed use.

This Cowarts soil is in capability subclass IVe. The woodland ordination symbol for this soil is 9A.

Cx—Coxville fine sandy loam. This soil is nearly level and poorly drained. It is in depressions on the uplands. The soil is seasonally ponded from late in fall to midspring. The mapped areas are 5 to 150 acres. The slopes are 0 to 2 percent.

Typically. the surface layer is very dark gray fine sandy loam about 6 inches thick. The upper part of the subsoil, to a depth of 12 inches, is gray sandy clay loam that has yellowish brown mottles. The remainder of the subsoil to a depth of 65 inches is gray sandy clay that has yellowish brown, red, strong brown, and yellowish red mottles.

This soil is low in natural fertility and medium in organic matter. The reaction of the soil is very strongly acid or strongly acid. The permeability is slow. The available water capacity is moderate. Soil tilth is good. Except late in the fall to midspring when the soil is ponded or the seasonal high water table is near the surface, the root zone is normally deep.

Included with this soil in mapping are small areas of Pelham soils. Also included are soils that are similar to Coxville soil except they have a loamy surface layer.

This Coxville soil is not suited to field crops. Pasture grasses are generally not grown.

Water oak, baldcypress, and blackgum are the common trees. Some areas are dominated by water-tolerant shrubs and grasses. Ponding is the main limitation to use of equipment on this soil and to seedling survival for other than the common water-tolerant trees.

This soil is poorly suited to most urban use and recreational development because of ponding. Unless outlets are available for drainage, this limitation is difficult to overcome.

This Coxville soil is in capability subclass Vw. The woodland ordination symbol for this soil is 4W.

DoA—Dothan loamy sand, 0 to 2 percent slopes. This soil is nearly level and well drained. It is on ridgetops on the uplands. The mapped areas are 10 to 40 acres.

Typically, the surface layer is dark grayish brown loamy sand about 10 inches thick. The subsoil extends to a depth of 66 inches or more. The upper part of the subsoil is yellowish brown sandy loam or sandy clay loam. The lower part is yellowish brown sandy clay loam that has yellowish red, white, and strong brown mottles. Plinthite is 5 percent or more below a depth of about 31 inches. Few nodules of ironstone are in the surface layer and the upper part of the subsoil.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. The available water capacity is moderate. Soil tilth is good. The soil is easily tilled within a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Fuquay and Tifton soils. Also included are wet areas that are less than 3 acres. These wet areas are indicated by a wet spot symbol on the map in the back of this publication.

This Dothan soil is well suited to field crops, hay, and pasture. During dry periods, this soil responds favorably to irrigation, and high yields can be obtained. A conservation tillage system helps maintain the content of organic matter in the soil and conserves moisture.

The potential of this soil for production of slash pine and loblolly pine is high. This soil has no significant limitations for woodland use or management.

This soil is well suited to most urban use and recreational development. However, permeability is moderately slow in the lower part of the subsoil and limits the use of the soil as septic tank absorption fields. Generally, this permeability limitation can be overcome by special design and proper application to the proposed use.

This Dothan soil is in capability class I. The woodland ordination symbol for this soil is 12A.

DoB—Dothan loamy sand, 2 to 5 percent slopes. This soil is very gently sloping and well drained. It is on ridgetops and hillsides on the uplands. The slopes are smooth and convex. The mapped areas are 5 to 90 acres.

Typically, the surface layer is grayish brown loamy sand about 9 inches thick. The upper part of the subsoil, to a depth of 15 inches, is yellowish brown sandy loam. The next layer, to a depth of 35 inches, is yellowish brown sandy clay loam. The next layer, to a depth of 44 inches, is yellowish brown sandy clay loam that has red and very pale brown mottles. The lower part of the subsoil is yellowish brown sandy clay loam that has white, red, and strong brown mottles. Plinthite is 5 percent or more below a depth of 35 inches. Nodules of ironstone are in the surface layer and the upper part of the subsoil.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. The available water capacity is moderate. Soil tilth is good. This soil is easily tilled within a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Cowarts, Fuquay, Stilson, and Tifton soils.

This Dothan soil is well suited to field crops, hay, and pasture (fig. 3). During dry periods, this soil responds favorably to irrigation, and high yields can be obtained. Erosion is a moderate hazard if this soil is cultivated and not protected. A conservation tillage system or a water management system, or a combination of both, reduces runoff and helps to control erosion.

The potential of this soil for production of loblolly pine and slash pine is high. Although this soil has no significant limitations for woodland use, woodland operations performed on the contour help keep soil erosion to a minimum.

This soil is well suited to most urban use and recreational development. However, permeability is moderately slow in the lower part of the subsoil and limits the use of the soil as septic tank absorption fields. Generally, this permeability limitation can be overcome by special design and proper application to the proposed use.

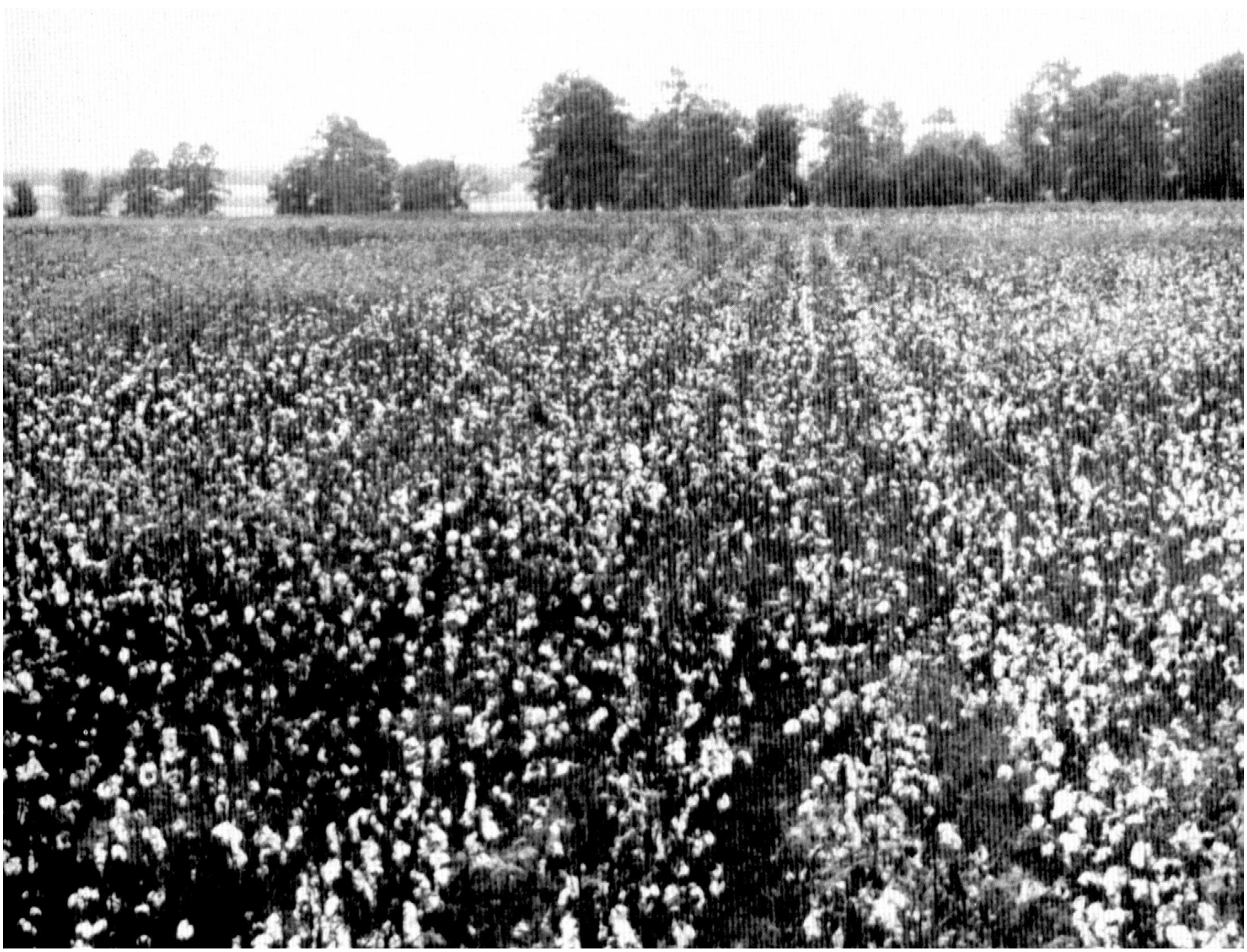


Figure 3.—Cotton on Dothan loamy sand, 2 to 5 percent slopes. This soil is prime farmland and well suited to cultivated crops.

This Dothan soil is in capability subclass IIe. The woodland ordination symbol for this soil is 12A.

EoB—Esto loamy sand, 2 to 5 percent slopes. This soil is very gently sloping and well drained. It is on ridgetops and hillsides on the uplands. The slopes generally are smooth and convex. The mapped areas are 5 to 40 acres.

Typically, the surface layer is dark grayish brown loamy sand about 5 inches thick. The upper part of the subsoil, to a depth of 9 inches, is strong brown sandy clay loam. The next layer, to a depth of 13 inches, is strong brown sandy clay. The next layer, to a depth of 29 inches, is yellowish brown clay that has red, light gray, and strong brown mottles. The lower part of the subsoil to a depth of 62 inches is mottled light gray, red, yellowish brown, and strong brown clay.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is slow. The available water capacity is moderate. Soil tilth is good. The effective root zone is limited because of the firm, clayey subsoil.

Included with this soil in mapping are small areas of Carnegie and Cowarts soils. Also included are soils in some eroded places that have a surface layer of sandy clay loam and also some rock outcrops in areas that are smaller than 1 acre. These outcrops are indicated by a rock outcrop symbol on the map in the back of this publication.

This Esto soil is well suited to field crops, hay, and pasture. However, yields are reduced because of the limited effective rooting depth. Erosion is a moderate hazard if this soil is cultivated and not protected. A conservation tillage system or a water management system, or a combination of both, reduces runoff and helps to control erosion.

The potential of this soil for production of loblolly pine and slash pine is moderate. Although this soil has no significant limitations for woodland use, woodland operations performed on the contour help keep soil erosion to a minimum.

This soil is only moderately suited to most urban use and recreational development. Permeability is slow in the subsoil and limits the use of this soil as septic tank absorption fields and for most recreational development. In addition, the shrink-swell potential of this soil further limits its use for urban development.

This Esto soil is in capability subclass IIIe. The woodland ordination symbol for this soil is 8A.

EoC—Esto loamy sand, 5 to 8 percent slopes. This soil is gently sloping and well drained. It is on hillsides on the uplands. The slopes are short, complex, and convex in most places. The mapped areas are 5 to 30 acres.

Typically, the surface layer is dark grayish brown loamy sand about 7 inches thick. The subsoil is mainly sandy clay and extends to a depth of 65 inches or more. The upper part of the subsoil is brownish yellow. The middle part is brownish yellow and strong brown and has red and gray mottles. The lower part is mottled in shades of red, brown, yellow, and gray. A few nodules of ironstone are in the surface layer.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is slow. The available water capacity is moderate. Runoff is rapid. Soil tilth is good. The effective root zone is limited because of the firm, clayey subsoil.

Included with this soil in mapping are small areas of Carnegie and Cowarts soils. Also included are some eroded soil in areas that have gullies and rills and some rock outcrops in areas that are smaller than 1 acre. These outcrops are indicated by a rock outcrop symbol on the map in the back of this publication.

This Esto soil is only moderately suited to field crops, hay, and pasture because of rapid runoff and the limited effective rooting depth. Erosion is a severe hazard if this soil is cultivated and not protected.

The potential of this soil for production of loblolly pine and slash pine is moderate. Although this soil has no significant limitations for woodland use, woodland operations performed on the contour help keep erosion to a minimum.

This soil is only moderately suited to most urban use and recreational development. Permeability is slow in the subsoil and limits the use of this soil as septic tank absorption fields and for most recreational development. In addition, the shrink-swell potential of this soil further limits its use for urban development.

This Esto soil is in capability subclass IVe. The woodland ordination symbol for this soil is 8A.

EoD—Esto loamy sand, 8 to 12 percent slopes. This soil is strongly sloping and well drained. It is on hillsides on the uplands. The slopes are short, complex, and convex in most places. The mapped areas are 5 to 15 acres.

Typically, the surface layer is dark grayish brown loamy sand about 5 inches thick. The subsurface layer is yellowish brown loamy sand to a depth of 12 inches. The subsoil extends to a depth of 65 inches or more. The upper part of the subsoil is strong brown clay, and the lower part is yellowish red clay that is mottled in shades of red, brown, yellow, and gray.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid. The permeability is slow. The available water capacity is moderate. Runoff is rapid. Soil tilth is good. The effective root zone is limited because of the firm, clayey subsoil.

Included with this soil in mapping are small areas of Carnegie and Orangeburg soils. Also included are rock outcrops in areas that are smaller than 1 acre. These outcrops are indicated by a rock outcrop symbol on the map in the back of this publication.

This Esto soil is not suited to field crops because of rapid runoff, limited effective rooting depth, and slope. However, it is moderately suited to hay and pasture. Erosion is a severe hazard if this soil is cultivated and not protected. Including grasses and legumes in the cropping system reduces runoff and helps to control erosion.

The potential of this soil for production of loblolly pine and slash pine is moderate. Although this soil has no significant limitations for woodland use, woodland operations performed on the contour help keep erosion to a minimum.

This soil is only moderately suited to most urban use and recreational development. Permeability is slow in the subsoil and limits the use of this soil as septic tank absorption fields and for most recreational development. In addition, the shrink-swell potential of this soil further limits its use for urban development.

This Esto soil is in capability subclass VIe. The woodland ordination symbol for this soil is 8A.

EsB—Esto-Susquehanna loamy sands, 2 to 5 percent slopes. The soils in this complex are very gently sloping and are well drained and somewhat poorly drained. These soils are on ridgetops on the uplands. The individual areas of the soils in this map unit are so intermingled that they could not be mapped separately at the scale used for the maps in the back of this publication. The mapped areas are 5 to 30 acres.

Esto loamy sand makes up about 60 percent of the map unit, and Susquehanna loamy sand makes up about 30 percent. The included soils make up about 10 percent of the map unit.

Typically, Esto soil has a surface layer of dark grayish brown loamy sand about 5 inches thick. The subsoil extends to a depth of 65 inches or more. The upper part of the subsoil is yellowish red clay that has brownish yellow and light gray mottles. The lower part is gray clay that has red, brownish yellow, and strong brown mottles.

Esto soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is slow. The available water capacity is moderate. Soil tilth is good. The effective root zone is limited because of the firm, clayey subsoil.

Typically, Susquehanna soil has a surface layer of dark grayish brown loamy sand about 4 inches thick. The upper part of the subsoil, to a depth of 10 inches, is reddish brown clay that has red mottles. The middle part, to a depth of 32 inches, is light brownish gray clay that has red and yellowish brown mottles. The lower part to a depth of 62 inches is gray and light olive gray clay that has olive yellow, strong brown, and yellow mottles.

Susquehanna soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is very slow. The available water capacity is high. Soil tilth is good. The root zone is somewhat restricted by the very firm, clayey subsoil. This soil is wet during periods of high rainfall.

Included in mapping are small areas of Carnegie and Cowarts soils.

The soils in this complex are moderately suited to field crops, hay, and pasture because of the limited effective rooting depth of these soils. Erosion is a moderate hazard if this soil is cultivated and not protected.

The soils in this complex are mostly in woodland. The potential of these soils for production of loblolly pine and slash pine is moderate because they have a firm and very firm, slowly and very slowly permeable subsoil. In places, subsoiling or chiseling after harvesting operations will accelerate revegetation or will improve the site for replanting. Woodland operations performed on the contour help keep soil erosion to a minimum.

Most of the soils in this complex are moderately suited to urban use and recreational development. The slow or very slow permeability and the shrink-swell potential of the subsoil are the main limitations.

The soils in this complex are in capability subclass IVe. The woodland ordination symbol for Esto soil is 8A, and it is 8C for Susquehanna soil.

EsD—Esto-Susquehanna loamy sands, 5 to 12 percent slopes. The soils in this complex are gently sloping and strongly sloping and are well drained and somewhat poorly drained. These soils are on ridgetops and hillsides on the uplands. The individual areas of the soils in this map unit are so intermingled that they could not be mapped separately at the scale used for the maps in the back of this publication. The mapped areas are 5 to 15 acres.

Esto loamy sand makes up about 60 percent of the map unit, and Susquehanna loamy sand makes up about 30 percent. The included soils make up about 10 percent of the map unit.

Typically, Esto soil has a surface layer of dark grayish brown loamy sand about 5 inches thick. The subsoil extends to a depth of 65 inches or more. The upper part of the subsoil is strong brown sandy clay loam or sandy clay that has brownish yellow and light gray mottles. The lower part is mottled gray, red, brownish yellow, and strong brown clay.

Esto soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is slow. The available water capacity is moderate. Runoff is rapid. Soil tilth is good.

The effective root zone is limited because of the firm, clayey subsoil.

Typically, Susquehanna soil has a surface layer of dark grayish brown loamy sand about 5 inches thick. The subsoil extends to a depth of 65 inches or more. The upper part of the subsoil is yellowish red clay that has strong brown and light gray mottles. The lower part is clay mottled in shades of gray, brown, and red.

Susquehanna soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is very slow. The available water capacity is high. Runoff is rapid. Soil tilth is good. The root zone is somewhat restricted by the very firm, clayey subsoil. This soil is wet during periods of high rainfall.

Included in mapping are small areas of Carnegie soils.

The soils in this complex are not suited to field crops. However, they are moderately suited to hay and pasture because of the limited effective rooting depth of these soils. Also, erosion is a severe hazard if this soil is cultivated and not protected.

The soils in this complex are mostly in woodland. The potential of these soils for production of loblolly pine and slash pine is moderate because the soils have a firm and very firm, slowly and very slowly permeable subsoil. In places, subsoiling or chiseling after harvesting operations will accelerate revegetation or will improve the site for replanting. Woodland operations performed on the contour help keep soil erosion to a minimum.

Most of the soils in this complex are moderately suited to urban use and recreational development. The slow or very slow permeability and the shrink-swell potential of the subsoil are the main limitations.

The soils in this complex are in capability subclass VIe. The woodland ordination symbol for Esto soil is 8A, and it is 8C for Susquehanna soil.

FrB—Freemanville sandy loam, 2 to 5 percent slopes. This soil is very gently sloping and well drained. It is on ridgetops on the uplands. The slopes generally are smooth and convex. The mapped areas are 5 to 100 acres.

Typically, the surface layer is dark brown sandy loam about 10 inches thick. The upper part of the subsoil, to a depth of 14 inches, is yellowish red sandy clay loam. The middle part, to a depth of about 46 inches, is yellowish red sandy clay. The next layer, to a depth of about 70 inches, is yellowish red sandy clay that has strong brown mottles. The lower part of the subsoil to a depth of about 96 inches is yellowish red sandy clay loam that has strong brown and gray mottles. Plinthite is 5 percent or more below a depth of 29 inches. Nodules of ironstone are in the surface layer and in the upper part of the subsoil.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid except in areas where the surface layer has been limed. The permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. The available water capacity is moderate. Soil tilth is good. This soil is easily tilled within a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Carnegie, Clarendon, and Tifton soils.

This Freemanville soil is well suited to field crops, hay, and pasture. During dry periods, this soil responds favorably to irrigation, and high yields can be obtained. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a moderate hazard if this soil is cultivated and not protected. A conservation tillage system or a water management system, or a combination of both, reduces runoff and helps to control erosion.

The potential of this soil for production of slash pine and loblolly pine is moderate. Although this soil has no significant limitations for woodland use, woodland operations performed on the contour help keep soil erosion to a minimum.

This soil is well suited to urban use. However, permeability is moderately slow in the subsoil and limits the use of this soil as septic tank absorption fields. Generally, this permeability limitation can be overcome by special design and proper application to the proposed use.

This soil is only moderately suited to most recreational development because of the small stones on the surface and because the subsoil is moderately slowly permeable.

This Freemanville soil is in capability subclass IIe. The woodland ordination symbol for this soil is 10A.

FsB—Fuquay loamy sand, 0 to 5 percent slopes. This soil is nearly level and very gently sloping and is well drained. It is on broad ridgetops on the uplands. The slopes are mostly smooth and convex. The mapped areas are 5 to 80 acres.

Typically, the surface layer is grayish brown loamy sand about 8 inches thick. The subsurface layer, to a depth of 26 inches, is light yellowish brown loamy sand. The upper part of the subsoil, to a depth of about 38 inches, is yellowish brown sandy loam. The next layer, to a depth of about 48 inches, is yellowish brown sandy clay loam. The next layer, to a depth of about 62 inches, is yellowish brown sandy clay loam that has red and light gray mottles. The lower part to a depth of about 80 inches is mottled brownish yellow, red, light gray and yellowish red sandy clay loam. Plinthite is 5 percent or more below a depth of 48 inches. This soil consists of a few nodules of ironstone to a depth of 48 inches.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderate in the upper part of the subsoil and slow in the lower part. The available water capacity is low. Soil tilth is good. This soil is easily tilled within a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Dothan and Lakeland soils. Also included are wet areas that are less than 3 acres. These wet areas are indicated by a wet spot symbol on the map in the back of this publication.

This Fuquay soil is only moderately suited to field crops, hay, and pasture because of the low available water capacity. Returning crop residue to the soil can overcome this limitation. During dry periods, this soil responds favorably to irrigation, and high yields can be obtained.

The potential of this soil for production of loblolly pine, slash pine, and longleaf pine is moderate. Because this soil has low available water capacity, seedling mortality is a concern in management. Proper planting procedures and the reduction of competing plants generally will increase the rate of seedling survival. Because of the sandiness of the soil, the use of conventional equipment generally is limited. Using special implements or scheduling planting and harvesting operations during wet periods will overcome the equipment use limitation.

This soil is well suited to most urban use. However, permeability is slow in the lower part of the subsoil and limits the use of this soil as septic tank absorption fields. Generally, this permeability limitation can be overcome by special design and proper application to the proposed use.

Because it is too sandy, this soil is only moderately suited to recreational development.

This Fuquay soil is in capability subclass IIs. The woodland ordination symbol for this soil is 8S.

FsC—Fuquay loamy sand, 5 to 8 percent slopes. This soil is gently sloping and well drained. It is on ridgetops and hillsides on the uplands. The slopes commonly are smooth and convex. The mapped areas are 5 to 30 acres.

Typically, the surface layer is dark grayish brown loamy sand about 8 inches thick. The subsurface layer, to a depth of about 34 inches, is light yellowish brown loamy sand. The subsoil is mainly sandy clay loam and extends to a depth of 60 inches or more. It is mostly yellowish brown except the lower part of the subsoil has reddish, grayish, and brownish mottles. Plinthite is 5 percent or more below a depth of 48 inches.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderate in the upper part of the subsoil and slow in the lower part. The available water capacity is low. Soil tilth is good. This soil is easily tilled within a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are small areas of Dothan and Lakeland soils.

This Fuquay soil is only moderately suited to field crops, hay, and pasture because of the low available water capacity and slope. Returning crop residue to the soil increases the available water capacity.

The potential of this soil for production of loblolly pine, slash pine, and longleaf pine is moderate. Because of the low available water capacity of this soil, seedling mortality is a concern in management. Proper planting procedures and the reduction of competing plants generally will increase the rate of seedling survival. Because of the sandiness of the soil, the use of conventional equipment generally is limited. Using special implements or scheduling planting and harvesting operations during the wet periods will overcome the equipment use limitation.

This soil is well suited to most urban use. However, permeability is slow in the lower part of the subsoil and limits the use of this soil as septic tank absorption fields. Generally, this permeability limitation can be overcome by special design and proper application to the proposed use.

Because the soil is too sandy, it is only moderately suited to recreational development.

This Fuquay soil is in capability subclass IIIs. The woodland ordination symbol for this soil is 8S.

He—Herod sandy loam, frequently flooded. This soil is nearly level and poorly drained. It is on the flood plains. This soil is frequently flooded for brief periods from late in fall to midspring. The mapped areas are 50 to 500 acres. The slopes are 0 to 2 percent.

Typically, the upper part of the surface layer is very dark gray sandy loam about 3 inches thick. The lower part, to a depth of 10 inches, is grayish brown sandy loam. The underlying material to a depth of 60 inches or more is gray sandy clay loam that has yellowish or brownish mottles and thin strata of sand.

This soil is medium in natural fertility and organic matter. The reaction of the soil is strongly acid or medium acid in the upper part, and it is medium acid to neutral in the lower part . The permeability is moderate. The available water capacity is high. Soil tilth is good during dry periods. Except during the winter and the spring when the soil is flooded or the water table is near the surface, the root zone is deep.

Included with this soil in mapping are areas of soils that are more sandy than Herod soil.

This Herod soil is in woodland. The potential of this soil for production of loblolly pine, slash pine, and sweetgum is high. However, seasonal wetness limits the use of conventional equipment on this soil and increases seedling mortality. The equipment use limitation generally can be overcome by using modified equipment or by scheduling planting and harvesting operations during dry periods. Proper drainage, bedding of rows, reduction of competing plants, and the use of adapted plants generally will increase the rate of seedling survival.

Because of wetness and flooding, this soil is not suited to field crops, and it is poorly suited to hay and pasture and recreational development. Wetness and flooding also severely limit the use of this soil for urban development. The wetness limitation and flooding hazard can be overcome only by installing and maintaining extensive flood control structures and drainage systems.

This Herod soil is in capability subclass Vw. The woodland ordination symbol for this soil is 9W.

HrA—Hornsville fine sandy loam, 0 to 2 percent slopes. This soil is nearly level and moderately well drained. It is on stream terraces. This soil is rarely flooded. The mapped areas are 5 to 30 acres.

Typically, the surface layer is dark gray fine sandy loam about 3 inches thick. The subsurface layer, to a depth of 11 inches, is brown fine sandy loam. The upper part of the subsoil, to a depth of 16 inches, is yellowish brown sandy clay loam. The next layer, to a depth of 23 inches, is yellowish red clay that has light yellowish brown mottles. The next layer, to a depth of about 36 inches, is mottled yellowish red, strong brown, red, and gray clay. The lower part of the subsoil to a depth of 82 inches or more is mottled strong brown, gray, yellowish red, and red sandy clay loam and sandy loam.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid except in areas where the surface layer and subsurface layer has been limed. The permeability is moderately slow. The available water capacity is moderate. Soil tilth is good. This soil is easily tilled within a wide range of moisture content. Except during the winter to midspring when the seasonal high water table is at a depth of 2.5 to 3.5 feet, the root zone is normally deep.

Included with this soil in mapping are a few small areas of Albany and Wahee soils.

This Hornsville soil is well suited to field crops, hay, and pasture. However, it is somewhat limited for these uses because of wetness, and a drainage system is needed in most places.

The potential of this soil for production of loblolly pine and slash pine is high. However, seasonal wetness limits the use of conventional equipment on this soil and increases seedling mortality. The equipment use limitation generally can be overcome by using modified or special equipment or by scheduling planting and harvesting operations during dry periods. Proper drainage and the use of adapted plants generally will increase the rate of seedling survival.

This soil is poorly suited to most urban uses because of flooding or wetness. It is moderately suited to most recreational development. Flood control measures and a drainage system are needed to overcome the flooding hazard and wetness limitation in most places.

This Hornsville soil is in capability subclass IIw. The woodland ordination symbol for this soil is 9W.

Ko—Kinston fine sandy loam, frequently flooded. This soil is nearly level and poorly drained. It is on the flood plains. This soil is frequently flooded for brief periods generally from late in fall to early in the summer. The mapped areas are 50 to 150 acres. The slopes are 0 to 2 percent.

Typically, the upper part of the surface layer is very dark grayish brown fine sandy loam about 6 inches thick. The lower part, to a depth of 12 inches, is dark grayish brown fine sandy loam. The upper part of the underlying material, to a depth of about 18 inches, is light gray sandy loam. The middle part, to a depth of about 60 inches, is gray and light gray sandy clay loam that has light gray, brown, yellow, and yellowish brown mottles. The lower part to a depth of about 66 inches or more is light gray sand that has brownish yellow mottles.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid. The permeability is moderate. The available water capacity is moderate. Except from midfall to late in the spring when the soil is flooded or the water table is near the surface and limits rooting depth, the root zone is normally deep.

Included with this soil in mapping are a few areas of Ocilla soils that are adjacent to the uplands. Also included are some soils that are more sandy than Kinston soil. These soils are on the flood plains adjacent to the stream channel.

This Kinston soil is mostly in woodland. The potential of this soil for production of loblolly pine and slash pine is high. However, seasonal wetness limits the use of conventional equipment on this soil and increases seedling mortality. The equipment use limitation generally can be overcome by using modified equipment or by scheduling planting and harvesting operations during dry periods. Proper drainage, bedding of rows, reduction of competing plants, and the use of adapted plants generally will increase the rate of seedling survival.

Because of wetness and flooding, this soil is not suited to field crops and is poorly suited to hay and pasture and recreational development. Wetness and flooding also severely limit the use of this soil for urban development. The wetness limitation and flooding hazard can be overcome only by installing and maintaining extensive flood control structures and drainage systems.

This Kinston soil is in capability subclass VIw. The woodland ordination symbol for this soil is 9W.

LaB—Lakeland sand, 0 to 5 percent slopes. This soil is nearly level and very gently sloping and is excessively drained. It is mainly on broad ridgetops on the uplands. The slopes are smooth and convex. The mapped areas are 5 to 200 acres.

Typically, the soil is sandy throughout. The surface layer is dark brown about 6 inches thick. The underlying material extends to a depth of 80 inches or more. The upper part of the underlying material is yellowish brown. The middle part is light yellowish brown. The lower part is pale brown.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is very rapid. The available water capacity is low. Soil tilth is good. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Albany and Fuquay soils. Also included in a few small areas is a soil that has more clay below a depth of 70 to 80 inches than Lakeland soil, small areas of a soil that is sandy throughout and has slopes of more than 5 percent, and small areas of a soil that is coarse sand throughout.

This Lakeland soil is poorly suited to field crops, hay, and pasture because of low available water capacity and low fertility. However, this soil responds well to irrigation, and yields can be substantially increased. Returning crop residue to the soil helps retain moisture.

The potential of this soil for production of slash pine and loblolly pine is moderate. Because this soil has low available water capacity, seedling mortality is a concern in management. Proper planting procedures, the use of adapted drought-hardy plants, and the reduction of competing plants generally will increase the rate of seedling survival. Because of the sandiness of the soil, the use of conventional equipment is limited. Using special implements or scheduling planting and harvesting operations during wet periods will help overcome the equipment use limitations.

This soil is well suited to most urban use. However, seepage is a limitation for most sanitary facilities.

This soil is poorly suited to most recreational development because it is too sandy.

This Lakeland soil is in capability subclass IVs. The woodland ordination symbol for this soil is 9S.

LeA—Leefield loamy sand, 0 to 2 percent slopes. This soil is nearly level and somewhat poorly drained. It is in smooth, even areas on the uplands. The mapped areas are 5 to 80 acres.

Typically, the surface layer is very dark gray loamy sand about 7 inches thick. The subsurface layer, to a depth of 25 inches, is light brownish gray loamy sand that has pale yellow mottles. The upper part of the subsoil, to a depth of about 31 inches, is light yellowish brown sandy loam that has light gray mottles. The middle part, to a depth of about 54 inches, is light yellowish brown sandy clay loam that has light gray, brownish yellow, and yellowish red mottles. The lower part to a depth of 60 inches or more is mottled yellowish brown, light gray, light yellowish brown, and red sandy clay loam. Plinthite is 5 percent or more below a depth of about 41 inches.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. The available water capacity is low. Soil tilth is good. This soil is easily tilled within a wide range of moisture content. Except from late in the fall to early in the spring when the seasonal high water table is at a depth of 1.5 to 2.5 feet, the root zone is normally deep.

Included with this soil in mapping are a few small areas of Pelham and Stilson soils. Also included are some wet areas that are less than 3 acres. These wet areas are indicated by a wet spot symbol on the map in the back of this publication.

This Leefield soil is only moderately suited to field crops, hay, and pasture because of wetness. This limitation generally can be overcome by installing and maintaining a drainage system.

The potential of this soil for production of loblolly pine and slash pine is moderate. Seasonal wetness limits the use of conventional equipment on this soil and increases seedling mortality. The equipment use limitation generally can be overcome by using modified or special implements or by scheduling planting and harvesting operations during dry periods. Proper drainage and reduction of competing plants generally will increase the rate of seedling survival.

This soil is only moderately suited to most urban use and recreational development because of wetness. Also, permeability is moderately slow in the lower part of the subsoil and limits the use of this soil as septic tank absorption fields. In most places, the wetness and permeability limitations can be overcome by special design and proper application to the proposed use.

This Leefield soil is in capability subclass IIw. The woodland ordination symbol for this soil is 9W.

LmB—Lucy loamy sand, 0 to 5 percent slopes. This soil is nearly level and very gently sloping and is well drained. It is on broad ridgetops on the uplands. The slopes are smooth and convex. The mapped areas are 10 to 300 acres.

Typically, the surface layer is brown loamy sand about 9 inches thick. The upper part of the subsurface layer, to a depth of 19 inches, is strong brown loamy sand. The lower part, to a depth of about 34 inches, is yellowish red loamy sand. The upper part of the subsoil, to a depth of about 42 inches, is yellowish red sandy loam. The lower part to a depth of 72 inches or more is red sandy clay loam.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderately rapid in the upper part of the soil and moderate in the lower part. The available water capacity is low. Soil tilth is good. The soil is easily tilled within a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small, intermingled areas of Norfolk and Orangeburg soils. Also included is a soil in a few small areas that is loamy sand to a depth of about 48 inches.

This Lucy soil is only moderately suited to field crops, hay, and pasture because of low available water capacity. Returning crop residue to the soil helps retain soil moisture. During dry periods, this soil responds favorably to irrigation, and high yields can be obtained.

The potential of this soil for production of slash pine and loblolly pine is moderate. Because this soil has low available water capacity, seedling mortality is a concern in management. Proper planting procedures and the reduction of competing plants generally will increase the rate of seedling survival. Because of the sandiness of the soil, the use of conventional equipment generally is limited. Using special implements and scheduling planting and harvesting operations during wet periods will help overcome the equipment use limitation.

This soil is well suited to most urban use. However, seepage is a limitation for some sanitary facilities.

This soil is only moderately suited to recreational development because it is too sandy.

This Lucy soil is in capability subclass IIs. The woodland ordination symbol for this soil is 12S.

LmC—Lucy loamy sand, 5 to 8 percent slopes. This soil is gently sloping and well drained. It is mainly on hillsides on the uplands. The slopes commonly are smooth and convex. The mapped areas are 10 to 40 acres.

Typically, the surface layer is dark brown loamy sand about 7 inches thick. The subsurface layer, to a depth of 32 inches, is brown loamy sand. The subsoil extends to a depth of 72 inches or more. The upper part of the subsoil is yellowish red sandy loam, and the lower part is red sandy clay loam.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderately rapid in the upper part of the soil and moderate in the lower part, The available water capacity is low. Soil tilth is good. The soil is easily tilled within a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small, intermingled areas of Norfolk and Orangeburg soils.

This Lucy soil is only moderately suited to field crops, hay, and pasture because of low available water capacity and slope. Returning crop residue to the soil helps retain moisture.

The potential of this soil for production of slash pine and loblolly pine is moderate. Because this soil has low available water capacity, seedling mortality is a concern in management. Proper planting procedures and the reduction of competing plants generally will increase the rate of seedling survival. Because of the sandiness of the soil, the use of conventional equipment generally is limited. Using special implements or scheduling planting and harvesting operations during wet periods will help overcome the equipment use limitation.

This soil is well suited to most urban use. However, seepage is a limitation for some sanitary facilities.

This soil is only moderately suited to recreational development because it is too sandy.

This Lucy soil is in capability subclass IIIs. The woodland ordination symbol for this soil is 12S.

NoA—Norfolk loamy sand, 0 to 2 percent slopes. This soil is nearly level and well drained. It is on broad ridgetops on the uplands. The mapped areas are 10 to 100 acres.

Typically, the surface layer is brown loamy sand about 10 inches thick. The subsoil extends to a depth of 60 inches or more. The upper part of the subsoil is yellowish brown sandy clay loam. The lower part is yellowish brown sandy clay loam that has red and gray mottles.

This soil is medium in natural fertility and low in organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderate. The available water capacity is moderate. Soil tilth is good. This soil is easily tilled within a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Orangeburg soils.

This Norfolk soil is well suited to field crops, hay, and pasture. During dry periods, this soil responds favorably to irrigation, and high yields can be obtained. A conservation tillage system helps maintain the content of organic matter and conserves moisture.

The potential of this soil for production of loblolly pine and slash pine is high. This soil has no significant limitations for woodland use or management.

This soil is well suited to most urban use and recreational development.

This Norfolk soil is in capability class I. The woodland ordination symbol for this soil is 9A.

NoB—Norfolk loamy sand, 2 to 5 percent slopes. This soil is very gently sloping and well drained. It is on ridgetops on the uplands. The slopes are smooth and convex. The mapped areas are 5 to 50 acres.

Typically, the surface layer is dark grayish brown loamy sand about 8 inches thick. The upper part of the subsoil, to a depth of about 15 inches, is yellowish brown sandy loam. The middle part, to a depth of 48 inches, is yellowish brown sandy clay loam. The lower part to a depth of 65 inches or more is yellowish brown sandy clay loam that has strong brown mottles.

This soil is medium in natural fertility and low in organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderate. The available water capacity is moderate. Soil tilth is good. This soil is easily tilled within a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Orangeburg soils. Also included are some soils in eroded areas in a few cultivated fields.

This Norfolk soil is well suited to field crops, hay, and pasture. During dry periods, this soil responds favorably to irrigation, and high yields can be obtained. Erosion is a moderate hazard if this soil is cultivated and not protected. A conservation tillage system or a water management system, or a combination of both, reduces runoff and helps to control erosion.

The potential of this soil for production of loblolly pine and slash pine is high. Although this soil has no significant limitations for woodland use, woodland operations performed on the contour help keep soil erosion to a minimum.

This soil is well suited to most urban use and recreational development.

This Norfolk soil is in capability subclass IIe. The woodland ordination symbol for this soil is 9A.

OcA—Ocilla loamy sand, 0 to 2 percent slopes. This soil is nearly level and somewhat poorly drained. It commonly is in broad, smooth, even areas on the uplands and on stream terraces. The seasonal high water table is at a depth of 1 foot to 2.5 feet generally in the winter to midspring. The mapped areas are 5 to 50 acres.

Typically, the surface layer is very dark gray loamy sand about 6 inches thick. The upper part of the subsurface layer, to a depth of about 20 inches, is light brownish gray loamy sand. The lower part, to a depth of about 32 inches, is pale brown loamy sand that has light yellowish brown and light gray mottles. The upper part of the subsoil, to a depth of 38 inches, is brownish yellow sandy loam that has light gray and yellowish brown mottles. The next layer, to a depth of about 48 inches, is brownish yellow sandy clay loam that has light gray, yellowish brown, and yellowish red mottles. The next layer, to a depth of 68 inches, is mottled light yellowish brown, light gray, and yellowish brown sandy clay loam. The lower part of the subsoil to a depth of 80 inches or more is mottled light yellowish brown, light gray, and strong brown sandy clay loam.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderate. The available water capacity is low. Soil tilth is good. This soil is easily tilled within a wide range of moisture content. Except during the winter to midspring when the seasonal high water table is at a depth of 1 foot to 2.5 feet, the root zone is normally deep.

Included with this soil in mapping are a few small areas of Pelham and Stilson soils. Also included are wet areas that are less than 2 acres. These wet areas are indicated by a wet spot symbol on the map in the back of this publication.

This Ocilla soil is only moderately suited to field crops, hay, and pasture because of wetness. Proper drainage generally will help overcome this limitation.

The potential of this soil for production of loblolly pine and slash pine is moderate. Seasonal wetness limits the use of conventional equipment on this soil and increases seedling mortality. The equipment use limitation generally can be overcome by using modified or special implements or by scheduling planting and harvesting operations during wet periods. Proper drainage and reduction of competing plants generally will increase the rate of seedling survival.

This soil is poorly suited to most urban use and is only moderately suited to recreational development because of wetness. Drainage is needed to reduce this limitation.

This Ocilla soil is in capability subclass IIIw. The woodland ordination symbol for this soil is 8W.

OrB—Orangeburg loamy sand, 2 to 5 percent slopes. This soil is very gently sloping and well drained. It is mainly on ridgetops on the uplands. The slopes are smooth and convex. The mapped areas are 10 to 200 acres.

Typically, the surface layer is brown loamy sand about 8 inches thick. The upper part of the subsoil, to a depth of about 12 inches, is yellowish red sandy loam. The lower part to a depth of 72 inches or more is red sandy clay loam.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderate. The available water capacity is moderate. Soil tilth is good. This soil is easily tilled within a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Lucy and Norfolk soils. Also included are small areas of a soil that has a slowly permeable layer in the subsoil, and it contains 5 to 10 percent small iron concretions. In a few areas are eroded soils that have a sandy clay loam surface layer.

This Orangeburg soil is well suited to field crops, hay, and pasture. During dry periods, this soil responds favorably to irrigation, and high yields can be obtained. Erosion is a moderate hazard if this soil is cultivated and not protected. A conservation tillage system or water management system, or a combination of both, reduces runoff and helps to control erosion.

The potential of this soil for production of loblolly pine and slash pine is high. Although this soil has no significant limitations for woodland use, woodland operations performed on the contour help keep soil erosion to a minimum.

This soil is well suited to most urban use and recreational development.

This Orangeburg soil is in capability subclass IIe. The woodland ordination symbol for this soil is 8A.

OrC—Orangeburg loamy sand, 5 to 8 percent slopes. This soil is gently sloping and well drained. It is mainly on hillsides on the uplands. Because of deep tillage, the loamy sand surface layer has mixed with material from the upper part of the subsoil. In most places, the slopes are smooth and convex. The mapped areas are 5 to 20 acres.

Typically, the surface layer is brown loamy sand about 6 inches thick. The subsoil extends to a depth of 65 inches. The upper few inches of the subsoil is yellowish red sandy loam. The next layer is red sandy clay loam. The lower part is red sandy clay loam that has brown mottles.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderate. The available water capacity is moderate. Soil tilth is good. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Lucy soils. Also included are small areas of soils that have a slowly permeable layer in the subsoil and a few small areas of eroded soils that have a sandy loam surface layer.

This Orangeburg soil is well suited to field crops, hay, and pasture. Good tilth can be maintained in most places by returning crop residue to the soil. Erosion is a moderate hazard if this soil is cultivated and not protected. A conservation tillage system or a water management system, or a combination of both, reduces runoff and helps to control erosion.

The potential of this soil for production of loblolly pine and slash pine is high. Although this soil has no significant limitations for woodland use, woodland operations performed on the contour help keep soil erosion to a minimum.

This soil is well suited to most urban use and recreational development.

This Orangeburg soil is in capability subclass IIIe. The woodland ordination symbol for this soil is 8A.

Pe—Pelham loamy sand. This soil is nearly level and poorly drained. It is on broad, smooth, low-lying areas on the uplands. The seasonal high water table is at a depth of 0.5 foot to 1.5 feet generally in the winter to midspring. The mapped areas are 5 to 40 acres. The slopes are 0 to 2 percent.

Typically, the surface layer is very dark grayish brown loamy sand about 3 inches thick. The upper part of the subsurface layer, to a depth of 14 inches, is grayish brown loamy sand. The lower part is gray loamy sand. The upper part of the subsoil, to a depth of about 32 inches, is light gray sandy loam that has pale brown mottles. The middle part, to a depth of about 65 inches, is light gray sandy clay loam that has yellowish brown mottles. The lower part to a depth of 80 inches or more is mottled light gray, yellowish brown, brownish yellow, and yellowish red sandy clay loam.

This soil is low in natural fertility and organic matter. The reaction of the soil is very strongly acid or strongly acid except in areas where the surface layer has been limed. The permeability is moderate. The available water capacity is low. Soil tilth is good. Except during the winter to midspring when the seasonal high water table is at a depth of 0.5 foot to 1.5 feet, the root zone is normally deep.

Included with this soil in mapping are small areas of Albany and Leefield soils.

Because of wetness, this Pelham soil is not suited to field crops. Pasture grasses generally are not grown.

The potential of this soil for production of slash pine and loblolly pine is high. Seasonal wetness limits the use of conventional equipment on this soil and increases seedling mortality. The equipment use limitation generally can be overcome by using modified equipment or by scheduling planting and harvesting operations during dry periods. Proper drainage, bedding of rows, reduction of competing plants, and the use of adapted plants generally increase the rate of seedling survival (fig. 4).

This soil is poorly suited to recreational development mainly because of wetness. This limitation also severely restricts the use of this soil for urban development. The wetness limitation can be overcome only by installing and maintaining an extensive drainage system.

This Pelham soil is in capability subclass Vw. The woodland ordination symbol for this soil is 11W.

Po—Pelham loamy sand, occasionally flooded. This soil is nearly level and poorly drained. It is in drainageways on the uplands. This soil is occasionally flooded for brief periods generally in the winter to midspring. The mapped areas are 50 to 200 acres. The slopes are 0 to 2 percent.

Typically, the surface layer is dark grayish brown loamy sand about 4 inches thick. The subsurface layer, to a depth of about 21 inches, is light brownish gray loamy sand. The subsoil to a depth of 65 inches or more is mainly light gray sandy clay loam.

Figure 4.—Loblolly pine on Pelham loamy sand. Though wetness is a concern in winter and spring, the potential of this soil for the production of commonly grown pine trees is high.

This soil is low in natural fertility and organic matter. The reaction of the soil is very strongly acid or strongly acid except in areas where the surface layer has been limed. The permeability is moderate. The available water capacity is low. Soil tilth is good. Except during the winter to midspring when the soil is flooded for brief periods or the seasonal high water table is at a depth of 0.5 foot to 1.5 feet, the root zone is normally deep.

Included with this soil in mapping are small areas of Albany and Leefield soils. Also included are some soils that are sandy throughout.

Because of wetness and flooding, this soil is not suited to field crops. Pasture grasses generally are not grown.

This Pelham soil is well suited to the production of slash pine and loblolly pine. Seasonal wetness limits the use of conventional equipment on this soil and increases seedling mortality. The equipment use limitation generally can be overcome by using modified equipment or by scheduling planting and harvesting operations during dry periods. Proper drainage, bedding of rows, reduction of competing plants, and the use of adapted plants generally will increase rate of seedling survival.

This soil is poorly suited to recreational development because of wetness and the hazard of flooding. Wetness and flooding also severely restrict the use of this soil for urban development. The wetness limitation and hazard of flooding can be overcome only by installing and maintaining extensive flood control structures and drainage systems.

This Pelham soil is in capability subclass Vw. The woodland ordination symbol for this soil is 11W.

ReB—Red Bay loamy sand, 2 to 5 percent slopes. This soil is very gently sloping and well drained. It is on broad ridgetops on the uplands. The slopes are smooth and convex. The mapped areas are 10 to 100 acres.

Typically, the surface layer is dark reddish brown loamy sand about 8 inches thick. The upper part of the subsoil is dark reddish sandy loam. The lower part to a depth of 96 inches or more is dark red sandy clay loam.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderate. The available water capacity is moderate. Soil tilth is good. This soil is easily tilled within a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few intermingled areas of Lucy and Orangeburg soils. Also included are a few small areas of soils that have slopes of less than 2 percent.

This Red Bay soil is well suited to field crops, hay, and pasture. During dry periods, this soil responds favorably to irrigation, and high yields can be obtained. Erosion is a moderate hazard if this soil is cultivated and not protected. A conservation tillage system or a water management system, or a combination of both, reduces runoff and helps to control erosion.

The potential of this soil for production of loblolly pine and slash pine is high. Although this soil has no significant limitations for woodland use, woodland operations performed on the contour help keep soil erosion to a minimum.

This soil is well suited to most urban use and recreational development.

This Red Bay soil is in capability class IIe. The woodland ordination symbol for this soil is 9A.

SeA—Stilson loamy sand, 0 to 2 percent slopes. This soil is nearly level and moderately well drained. It is in smooth areas on the uplands. The mapped areas are 5 to 30 acres.

Typically, the surface layer is dark grayish brown loamy sand about 8 inches thick. The subsurface layer, to a depth of 25 inches, is light yellowish brown loamy sand. The upper part of the subsoil, to a depth of about 30 inches, is light yellowish brown sandy loam. The lower part to a depth of 80 inches or more is brownish yellow sandy clay loam that has yellowish brown, light brownish gray, light gray, yellowish red, and strong brown mottles. Plinthite is 5 percent or more below a depth of about 45 inches.

This soil is low in natural fertility and organic matter. The reaction of the soil is very strongly acid or strongly acid except in areas where the surface layer has been limed. The permeability is moderate. The available water capacity is low. Soil tilth is good. The soil is easily tilled within a wide range of moisture content. Except from late in the fall to midspring when the water table is at a depth of 2.5 to 3 feet, the root zone is normally deep.

Included with this soil in mapping are a few small areas of Dothan, Fuquay, and Leefield soils.

This Stilson soil is only moderately suited to field crops, hay and pasture because of wetness. Drainage is needed in most places. During dry periods, this soil responds favorably to irrigation, and high yields can be obtained.

The potential of this soil for production of loblolly pine and slash pine is high. However, seasonal wetness limits the use of conventional equipment on this soil. The equipment use limitation generally can be overcome by using modified or special equipment or by scheduling planting and harvesting operations during the dry periods.

This soil is well suited to most urban use and recreational development. However, the seasonal high water table limits the use of this soil as septic tank absorption fields. Generally, this water table limitation can be overcome by special design and proper application to the proposed use.

This Stilson soil is in capability subclass IIw. The woodland ordination symbol for this soil is 9W.

TfA—Tifton loamy sand, 0 to 2 percent slopes. This soil is nearly level and well drained. It is on ridgetops on the uplands. The mapped areas are 5 to 80 acres.

Typically, the surface layer is dark grayish brown loamy sand about 9 inches thick. The subsoil extends to a depth of 65 inches or more. The upper part of the subsoil is yellowish brown sandy loam. The lower part is yellowish brown sandy clay loam that has red and gray mottles. Plinthite is 5 percent or more below a depth of about 35 inches. Nodules of ironstone are on and in the surface layer and in the upper part of the subsoil.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderate. The available water capacity is moderate. Soil tilth is good. This soil is easily tilled within a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Dothan and Fuquay soils. Also included are wet areas that are smaller than 3 acres. These wet areas are indicated by a wet spot symbol on the map in the back of this publication.

This Tifton soil is well suited to field crops, hay, and pasture. During dry periods, this soil responds favorably to irrigation, and high yields can be obtained. A conservation tillage system helps maintain the content of organic matter and conserves moisture.

The potential of this soil for production of loblolly pine and slash pine is high. This soil has no limitations for woodland use or management.

This soil is well suited to most urban use and recreational development. However, permeability is moderate in the subsoil and limits the use of this soil as septic tank absorption fields. Generally, this permeability limitation can be overcome by special design and proper application to the proposed use.

This Tifton soil is in capability class I. The woodland ordination symbol for this soil is 9A.

TfB—Tifton loamy sand, 2 to 5 percent slopes. This soil is very gently sloping and well drained. It is on ridgetops and hillsides on the uplands. The slopes commonly are smooth and convex. The mapped areas are 5 to 150 acres.

Typically, the surface layer is dark grayish brown loamy sand about 10 inches thick. The upper part of the subsoil, to a depth of 16 inches, is yellowish brown sandy loam. The middle part, to a depth of 42 inches, is yellowish brown sandy clay loam. The lower part to a depth of 80 inches or more is yellowish brown and mottled strong brown, yellowish brown, red, light gray, and yellowish red sandy clay loam. Plinthite is 5 percent or more below a depth of about 42 inches. Nodules of ironstone are on and in the upper 56 inches of the soil.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderate. The available water capacity is moderate. Soil tilth is good. This soil is easily tilled within a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Cowarts, Dothan, and Fuquay soils. Also included are areas of a soil that has a few shallow gullies and rills.

This Tifton soil is well suited to field crops, hay, and pasture (fig.5). During dry periods, this soil responds favorably to irrigation, and high yields can be obtained. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a moderate hazard if this soil is cultivated and not protected. A conservation tillage system or a water management system, or a combination of both, reduces runoff and helps to control erosion.

The potential of this soil for production of loblolly pine and slash pine is high. Although this soil has no limitations for woodland use, woodland operations performed on the contour help keep soil loss to a minimum.

This soil is well suited to most urban use and recreational development. However, permeability is moderate in the subsoil and limits the use of this soil as septic tank absorption fields. Generally, this permeability limitation can be overcome by special design and proper application to the proposed use.

This Tifton soil is in capability subclass IIe. The woodland ordination symbol for this soil is 9A.

TfC—Tifton loamy sand, 5 to 8 percent slopes. This soil is gently sloping and well drained. It is mainly on hillsides on the uplands. Because of deep tillage, the loamy sand surface layer has mixed with material from the upper part of the subsoil. In most places, the slopes are smooth and convex. The mapped areas are 4 to 15 acres.

Typically, the surface layer is dark grayish brown loamy sand about 6 inches thick. The subsoil is predominately sandy clay loam and extends to a depth of 65 inches or more. The upper part of the subsoil is yellowish brown. The middle part is yellowish brown and has yellowish red mottles. The lower part is yellowish brown and has yellowish red and light gray mottles. Plinthite is 5 percent or more below a depth of about 32 inches. Nodules of ironstone are mainly on and in the surface layer and in the upper part of the subsoil.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderate. The available water capacity is moderate. Soil tilth is good. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Carnegie and Cowarts soils.

This Tifton soil is well suited to field crops, hay, and pasture. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a severe hazard if this soil is cultivated and not protected. A conservation tillage system or a water management system, or a combination of both, reduces runoff and helps to control erosion.

The potential of this soil for production of loblolly pine and slash pine is high. Although this soil has no significant limitations for woodland use, woodland

Figure 5.—Peanuts on Tifton loamy sand, 2 to 5 percent slopes. This prime farmland soil is well suited to cultivated crops.

operations performed on the contour help keep soil erosion to a minimum.

This soil is well suited to most urban use and recreational development. However, permeability is moderate in the subsoil and limits the use of this soil as septic tank absorption fields. Generally, this permeability limitation can be overcome by special design and proper application to the proposed use.

This Tifton soil is in capability subclass IIIe. The woodland ordination symbol for this soil is 9A.

WaB—Wagram loamy sand, 0 to 5 percent slopes. This soil is nearly level and very gently sloping and is well drained. It is on narrow to broad ridgetops on the uplands. The slopes are smooth and convex. The mapped areas are 5 to 200 acres.

Typically, the surface layer is brown loamy sand about 8 inches thick. The subsurface layer, to a depth of 30 inches, is light yellowish brown loamy sand. The upper part of the subsoil, to a depth of 38 inches, is brownish yellow sandy loam. The lower part to a depth of 96 inches or more is mainly yellowish brown sandy clay loam.

This soil is low in natural fertility and organic matter. The reaction of the soil is strongly acid or very strongly acid except in areas where the surface layer has been limed. The permeability is moderate. The available water capacity is low. Soil tilth is good. This soil is easily tilled within a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Norfolk, Lucy, and Orangeburg soils.

This Wagram soil is only moderately suited to field crops, hay and pasture because of low available water capacity. Returning crop residue to the soil can overcome this limitation. During dry periods, this soil responds favorably to irrigation, and high yields can be obtained (fig. 6).

The potential of this soil for production of loblolly pine, slash pine, and longleaf pine is moderate. Because this soil has low available water capacity, seedling mortality is a concern in management. Proper planting procedures and the reduction of competing plants generally will increase the rate of seedling survival. Because of the sandiness of the soil, the use of conventional equipment is limited. Using special implements or scheduling planting and harvesting operations during wet periods will overcome the equipment use limitation.

This soil is well suited to most urban use. However, seepage is a limitation for some sanitary facilities.

This soil is only moderately suited to recreational development because it is too sandy.

This Wagram soil is in capability subclass IIs. The woodland ordination symbol for this soil is 8S.

WeA—Wahee fine sandy loam, 0 to 2 percent slopes, frequently flooded. This soil is nearly level and somewhat poorly drained. It is on terraces on the larger streams. This soil is frequently flooded for brief periods from early in the winter to midspring. The mapped areas are 10 to 65 acres.

Typically, the surface layer is very dark gray fine sandy loam about 4 inches thick. The subsurface layer, to a depth of 12 inches, is grayish brown fine sandy loam. The upper part of the subsoil, to a depth of about 15 inches, is light yellowish brown sandy clay loam that has brownish yellow and gray mottles. The next layer, to a depth of about 20 inches, is pale olive clay that has gray,

Figure 6.—Soybeans on Wagram loamy sand, 0 to 5 percent slopes. This soil does not naturally have adequate available water capacity, but a conservation tillage system increases the soil's ability to retain moisture.

yellowish brown, and yellowish red mottles. The next layer, to a depth of 50 inches, is gray clay that has yellowish brown and yellowish red mottles. The lower part to a depth of 65 inches or more is light gray sandy clay loam that has brownish yellow mottles.

This soil is low in natural fertility and organic matter. The reaction of the soil is very strongly acid or strongly acid except in areas where the surface layer has been limed. The permeability is slow. The available water capacity is high. Except from early in the winter to early in the spring when the seasonal high water table is at a depth of 0.5 foot to 1.5 feet, the root zone is normally deep.

Included with this soil in mapping are small areas of Pelham and Ocilla soils.

This Wahee soil is poorly suited to field crops because of wetness and flooding. However, it is moderately suited to hay and pasture. Installing and maintaining drainage systems and flood control structures will help overcome these limitations.

The potential of this soil for production of loblolly pine, slash pine, and sweetgum is high. However, seasonal wetness limits the use of conventional equipment on this soil. This limitation generally can be overcome by using modified or special equipment or by scheduling planting and harvesting operations during dry periods. Proper drainage and the use of adapted plants generally will increase the rate of seedling survival.

This soil is poorly suited to most recreational development because of wetness and flooding. Wetness and flooding also severely limit the use of this soil for urban development. These limitations can only be overcome by installing and maintaining flood control structures and drainage systems.

This Wahee soil is in capability subclass IVw. The woodland ordination symbol for this soil is 9W.

Important Farmland

In Worth County, some soils are important for producing food, feed, fiber, forage, and oilseed crops.

The map units that make up *prime farmland* and *additional farmland of statewide importance*, and the acreage of each, are listed in table 5. This list does not constitute a recommendation for a particular land use. The location of each map unit is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units."

Prime Farmland

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

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

Prime farmland soils may presently be in use as cropland, pasture, or woodland, or they may be in other uses. They either are used for producing food or fiber or are available for these uses. Urban or built-up land, public land, and water areas cannot be considered prime farmland. Urban or built-up land is any contiguous unit of land 10 acres or more in size that is used for such purposes as housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water control structures. Public land is land not available for farming in national forests, national parks, military reservations, and state parks.

Prime farmland soils usually get an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not subject to frequent flooding during the growing season. The slope ranges mainly from 0 to 8 percent. For more detailed information on the criteria for prime farmland consult the local staff of the Soil Conservation Service.

In Worth County, 182,635 acres, or about 50 percent of the county, meets the requirements for prime farmland (see table 5).

Additional Farmland of Statewide Importance

A recent trend in land use in some parts of the county has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on additional farmland of statewide importance.

In Worth County, 71,695 acres is additional farmland of statewide importance (see table 5). This farmland consists of soils that are important to the agricultural resource base in the county but that do not meet the requirements for prime farmland. These soils are more erodible, droughty, seasonally wet, difficult to cultivate, and generally are less productive than prime farmland soils. The slope is 8 percent or less.

Use and Management of the Soils

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

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

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

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

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

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

Crops and Pasture

Mary B. Leidner, conservation agronomist, Soil Conservation Service, helped to prepare this section.

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

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

Controlling erosion, removing excess water, and maintaining good tilth and productivity are the most common needs in the management of farmland in the county.

Many of the soils in Worth County, such as Carnegie, Cowarts, Esto, Freemanville, Orangeburg, and Red Bay soils, are susceptible to erosion. The degree of susceptibility depends on the erodibility of the soil, the frequency and intensity of rainfall, the steepness and length of slope, and management of crop residue as a mulch.

Loss of the surface layer through erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on soils that have a clayey subsoil, such as Carnegie and Esto soils. Second, soil erosion on farmland results in sedimentation of streams. Control of erosion minimizes the pollution of streams by sediment and improves the quality of water for municipal use, for recreation, and for fish and wildlife.

Erosion control practices provide protective surface cover, reduce runoff, and increase infiltration. A cropping system that keeps plant cover on the soil for extended periods helps to maintain the productive capacity of the soils. On livestock farms, which require pasture and hay, the grass forage crops in the cropping system reduce erosion on sloping land and improve tilth for the following crop.

Using conservation tillage systems that leave adequate amounts of crop residue on the surface increases infiltration and reduces runoff and erosion. This practice can be used on most soils in Worth County. No-tillage planting of corn and soybeans reduces erosion on sloping land and can be adapted to most soils in Worth County. Conservation tillage is an important soil conservation practice in the county, and the acreages used for this practice is increasing.

Terraces and diversions reduce the length of slope, reduce runoff, and control concentrated water flows. They are most practical on well drained, very gently sloping or gently sloping soils that have smooth and convex slopes. Carnegie, Cowarts, Dothan, Esto, Freemanville, Norfolk, Orangeburg, Red Bay, and Tifton soils are suitable for terraces in most places.

Contouring is an effective erosion control practice in Worth County. It is most effective on soils that have smooth, relatively short, uniform slopes, including most areas of the very gently sloping or gently sloping Carnegie, Cowarts, Dothan, Esto, Freemanville, Norfolk, Orangeburg, Red Bay, and Tifton soils.

Soil blowing is a concern on sandy soils, such as Fuquay, Lakeland, Lucy, and Wagram soils. Soil blowing can damage these soils and the young plants growing on them if the soils are dry and have little surface mulch. Maintaining plant cover or surface mulch or keeping the surface rough through proper tillage minimizes soil blowing. Windbreaks effectively reduce soil blowing in broad, open fields.

Information on the design of erosion control practices for each kind of soil is available from local offices of the Soil Conservation Service.

Excess water is the main limitation on soils that are not well drained. The type of drainage system needed depends on the amount of water in the soils and the kind of crops grown. The design of both surface and subsurface drainage systems varies with the kind of soil. After the water is controlled, only practices that help to maintain productivity and good tilth are needed. Erosion is not a serious problem on these soils in most places.

Soil fertility is naturally low in most soils in Worth County. However, these soils respond well to fertilization and other management practices. The poorly drained soils in depressions on the uplands, along drainageways, and on the flood plains, such as Coxville, Herod, Kinston, and Pelham soils, generally have more organic matter than most well drained soils on the uplands and stream terraces.

Most of the soils are naturally acid. If the soils used for cultivated crops and pasture have never been limed, applications of ground limestone are needed to raise the pH level sufficiently and to obtain high yields for legumes and other crops that grow best on nearly neutral soils. Herod soils are naturally less acid than other soils in the county. The available phosphorus and potash levels are naturally low in most of the soils. On all soils, additions of lime and fertilizer should be based on the results of soil tests, on the needs of the crop, and on the desired level of yields. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime to apply.

Soil tilth is an important factor in the germination of seeds and the infiltration of water into the soil. Soils with good tilth are granular and porous.

Most of the soils used for crops in Worth County have a surface layer of loamy sand that is low in organic matter. Soil tilth is good in most places. Regular additions of crop residue, manure, and other organic material help to maintain tilth.

Fall plowing is generally not a good practice in Worth County. Most of the cropland consists of soils that are subject to damaging erosion if plowed in the fall.

Many field crops are suited to the soils and climate of Worth County. Corn, peanuts, and soybeans are generally grown, and wheat, rye, and oats are the common small grains. Improved bermudagrass and bahiagrass are common pasture grasses.

Improved bermudagrass and bahiagrass are well suited to loamy or clayey soils that are moderately well drained and well drained. Clarendon, Dothan, and Tifton soils are representative of these soils (fig. 7). Lakeland, Fuquay, and Lucy soils are representative of those soils that have low available water capacity and are best suited to improved bermudagrass. Albany, Leefield, Ocilla, and Pelham soils are representative of those soils that are seasonally wet and are best suited to bahiagrass.

Special crops grown commercially in Worth County are vegetables and tree fruits. Pecans and sunflowers also are important.

Soils that have good, natural drainage and that warm up early in the spring, such as Carnegie, Cowarts, Dothan, Esto, Freemanville, Norfolk, Orangeburg, Red Bay, and Tifton soils that have slopes of 8 percent or less, are especially well suited to many vegetables and small fruits. Sandy soils, such as Lakeland, Lucy, and Wagram soils, are also well suited to vegetables and small fruits if irrigated. Crops can generally be planted and harvested earlier on these soils than on the other soils in Worth County.

If excess water is removed, Albany, Leefield, Ocilla, Clarendon, and Hornsville soils are well suited to a wide range of vegetables.

Most of the well drained soils in Worth County are suitable for orchards and nursery plants. Soils in low positions where frost is frequent and air drainage is poor generally are poorly suited to early vegetables, small fruits, and orchards.

Latest information and suggestions for growing special crops can be obtained from local offices of the Cooperative Extension Service and the Soil Conservation Service.

Yields Per Acre

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

Figure 7.—Improved bermudagrass on Tifton loamy sand, 2 to 5 percent slopes. This soil is well suited to the grasses used for pasture.

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

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

Fertilizer needs of specific crops on specific soils can be determined by soil tests. General fertilizer recommendations for field crops are also available *(5)*.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

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

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the

Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

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

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

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

Class I soils have few limitations that restrict their use.

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

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

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

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

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

Class VII soils have very severe limitations that make them unsuitable for cultivation. No class VII soils are recognized in this survey.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production. No class VIII soils are recognized in this survey.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w,* or *s* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless a close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); and *s* shows that the soil is limited mainly because it is droughty.

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

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

Woodland Management and Productivity

Gary L. Tyre, forester, Soil Conservation Service, helped to prepare this section.

The most significant forest types in Worth County are longleaf-slash pine, loblolly-shortleaf pine, oak-pine, oak-hickory, and oak-gum-cypress. These forest types were also predominant in the virgin forests, which covered most of the soils in the county.

Forest land makes up 156,223 acres, or 42 percent, of Worth County. Pure pine stands make up 67 percent of the forest land; oak-pine, 7 percent; oak-hickory, 8 percent; and oak-gum-cypress, 18 percent.

The predominant ownership of forest land in Worth County is private. These holdings account for about 96 percent of the forest land. The forest industry and private corporate ownerships control most of the remaining forest land *(15)*.

From 1970 to 1980, the amount of forest land in Worth County has decreased by about 9 percent. This reduction in the amount of forest land has increased the amount of land used for field crops, hay, and pasture. More recently, this trend has slowed or been reversed as many landowners are converting marginal cropland to trees. Much of this marginal cropland is well suited to trees and is relatively productive. About one-third of the forest land in the county will produce a cord or more per acre annually.

Stocking on forest land in the county generally reflects productivity. About 36 percent of the county is fully stocked. Moreover, the trend in stocking rates for trees in smaller-size classes has been downward in recent years. This seems to reflect inadequate regeneration of commercial species after harvesting and will result in significantly reduced yields in the future.

Forests in Worth County are on a wide variety of soils. The major soils include Carnegie, Tifton, Pelham, Cowarts, and Esto soils. These soils are well drained and are on ridgetops and hillsides. Exceptions are Pelham soils that are poorly drained and have management limitations. In places, surface drainage can alleviate the severity of these limitations. Site index for these soils ranges from a high of 90 for Pelham soils to a low of 82 for Esto soils.

Other predominant forest soils include Fuquay, Wagram, and Lakeland soils. The potential of these soils for woodland productivity is moderate with a site index in the mid to low 80's.

Herod and Kinston soils are near the major drainageways in the county. These soils are highly productive with site indices over 100. However, the wet, poorly drained conditions associated with these soils lead to severe restrictions on equipment use and to high seedling mortality.

Information in this section is provided to explain soil-tree growth relationships in Worth County. Used carefully, this information can provide a useful tool for planning conservation practices and for making investment and management decisions.

Soils vary in their ability to produce trees. Depth, fertility, texture, and the available water capacity influence tree growth. Elevation, aspect, and climate determine the kinds of trees that can grow on a site. Available water capacity and depth of the root zone are major influences of tree growth.

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to fertilization than others, and some are more susceptible to landslides and erosion after roads are built and timber is harvested. Some soils require special efforts to reforest. In the section "Detailed Soil Map Units," each map unit in the survey area suitable for producing timber presents information about productivity, limitations for harvesting timber, and management concerns for producing timber. Table 8 summarizes this forestry information and rates the soils for a number of factors to be considered in management. *Slight, moderate*, and *severe* are used to indicate the degree of the major soil limitations to be considered in forest management.

The first tree listed for each soil under the column "Common trees" is the indicator species for that soil. An indicator species is a tree that is common in the area and that is generally the most productive on a given soil.

Table 8 lists the *ordination symbol* for each soil. The first part of the ordination symbol, a number, indicates the potential productivity of a soil for the indicator species in cubic meters per hectare. The larger the number, the greater the potential productivity. Potential productivity is based on the site index and the point where mean annual increment is the greatest.

The second part of the ordination symbol, a letter, indicates the major kind of soil limitation for use and management. The letter *W* indicates a soil in which excessive water, either seasonal or year-round, causes a significant limitation. The letter *C* indicates a soil that has a limitation because of the kind or amount of clay in the upper part of the soil. The letter *S* indicates a dry, sandy soil. The letter *A* indicates a soil that has no significant restrictions or limitations for forest use and management. If a soil has more than one limitation, the priority is as follows: W, C, and S.

Ratings of the *erosion hazard* indicate the probability that damage may occur if site preparation activities or harvesting operations expose the soil. The risk is *slight* if no particular preventive measures are needed under ordinary conditions; *moderate* if erosion control measures are needed for particular silvicultural activities; and *severe* if special precautions are needed to control erosion for most silvicultural activities. Ratings of *moderate* or *severe* indicate the need for construction of higher standard roads, additional maintenance of roads, additional care in planning of harvesting and reforestation operations, or use of specialized equipment.

Ratings of *equipment limitation* indicate limits on the use of forest management equipment, year-round or seasonal, because of such soil characteristics as slope, wetness, stoniness, or susceptibility of the surface layer to compaction. As slope gradient and length increase, it becomes more difficult to use wheeled equipment. The rating is *slight* if equipment use is restricted by soil wetness for less than 2 months and if special equipment is not needed. The rating is *moderate* if soil wetness restricts equipment use from 2 to 6 months per year or if special equipment is needed to avoid or reduce soil compaction. The rating is *severe* if soil wetness restricts equipment use for more than 6 months per year or if special equipment is needed to avoid or reduce soil compaction. Ratings of *moderate* or *severe* indicate a need to choose the most suitable equipment and to carefully plan the timing of harvesting and other management operations.

Ratings of *seedling mortality* refer to the probability of death of naturally occurring or properly planted seedlings of good stock in periods of normal rainfall as influenced by kinds of soil or topographic features. *Seedling mortality* is caused primarily by too much water or too little water. The factors used in rating a soil for seedling mortality are texture of the surface layer, depth and duration of the water table, rock fragments in the surface layer, rooting depth, and the aspect of the slope. Mortality generally is greatest on soils that have a sandy or clayey surface layer. The risk is *slight* if, after site preparation, expected mortality is less than 25 percent; *moderate* if expected mortality is between 25 and 50 percent; and *severe* if expected mortality exceeds 50 percent. Ratings of *moderate* or *severe* indicate that it may be necessary to use containerized or larger than usual planting stock or to make special site preparations, such as bedding, furrowing, installing surface drainage, or providing artificial shade for seedlings. Reinforcement planting is often needed if the risk is *moderate* or *severe*.

The potential productivity of *common trees* on a soil is expressed as a *site index*. Common trees are listed in the order of their observed general occurrence. Generally, only two or three tree species dominate.

The soils that are commonly used to produce timber have the yield predicted in cubic feet and board feet. The yield is predicted at the point where mean annual increment culminates.

The *site index* is determined by taking height measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that the trees attain in a specified number of years. This index applies to fully stocked, even-aged, unmanaged stands and is determined by using site index curves *(3, 4, 7, 8, 10)*.

The *productivity class* represents an expected volume produced by the most important trees, expressed in cubic meters per hectare per year. Cubic meters per hectare can be converted to cubic feet per acre by multiplying by 14.3. It can be converted to board feet by multiplying by a factor of about 71. For example, a productivity class of 8 means the soil can be expected to produce 114 cubic feet per acre per year at the point where mean annual increment culminates, or about 568 board feet per acre per year.

Trees to plant are those that are used for reforestation or, if suitable conditions exist, natural regeneration. They are suited to the soils and will produce a commercial wood crop. Desired product, topographic position (such as a low, wet area), and personal preference are three factors of many that can influence the choice of trees to use for reforestation.

Recreation

Worth County provides many opportunities for recreation. The many farm ponds in the county provide fishing. Fishing and boating are available in some areas of Lake Blackshear. The flood plains near the creeks and rivers, depressional areas, and areas in the low-lying uplands provide an environment that is well suited to nature study, hunting, and similar activities. Dothan, Norfolk, Orangeburg, Red Bay, and Tifton soils generally are on ridgetops or hillsides, or on both, and these soil are well suited to campsites, picnic areas, parks, paths and trails, golf courses, and nature study areas. Also, the soils that are on ridgetops can be leveled and smoothed for playgrounds. However, the small surface stones are a limitation to use of Tifton soils for playgrounds.

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

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

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

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have gentle slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes, stones, or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

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

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Louis Justice, biologist, Soil Conservation Service, helped to prepare this section.

Worth County is mostly rural environments that have fair habitat for wildlife mainly in cropland and woodland settings. Fish and wildlife are important for recreation and contribute to the local economy.

About 46 percent of the county is forested and about 53 percent is in row crops and pasture. Forests in this county are about 33 percent hardwoods (the gum-oaks community of the lowland and river swamp hardwoods, the gum-cypress community of the upland depressions, the live-turkey-laurel oaks community of the sandhill forest, the beech-magnolia community of the sinkholes; and the lowland evergreen hardwoods, such as water oak and swamp tupelo); and 42 percent or more pines, 25 percent mixed pine-hardwoods (longleaf-dwarf oaks of the dry pine barrens, loblolly-shortleaf-persimmons of the pine plantations, and loblolly-blackgum-oaks of the typical pine-deciduous hardwoods stands).

Major plants of importance to terrestrial wildlife include greenbrier, shrub and annual lespedezas, panicgrass, croton, ragweed, partridgepea, paspalum, tickclover, and sumac. Overstory and understory woodland plants of importance are sweetgum, blackgum, pine, oak, hickory, holly, blackberry, elderberry, hackberry, and maple. Domestic plants of importance to wildlife include peanut, corn, soybeans, bahiagrass, sunflowers, and small grains.

Cropland, interspersed with pine plantations and hardwood forests, provides habitat for white-tailed deer, mourning dove, racoon, gray squirrel, fox squirrel, rabbit, bobwhite quail, opossum, fox, and other wildlife.

Unmanaged pasture, old fields, young pine plantations, and thinned woodlands produce numerous native woody and herbaceous plants that provide food and cover for deer, rabbits, fox, quail, and other wildlife.

Land use trends toward extensive clearing of woodland for row crops and the introduction of irrigation are affecting fish and wildlife populations. The removal of crop residue from fields, the removal of hedgerows and odd areas, and the increased siltation problems are elements of this land use trend that have an adverse effect on habitat for fish and wildlife. Many chemicals used to increase agriculture production harm small birds and animals. The most seriously affected game species is quail.

Restoring hedgerows, field borders, windbreaks, and odd areas in fields will improve habitat for wildlife. Wind damage to young crops is encouraging landowners and managers to establish windbreaks. This can also be helpful to wildlife if suitable plants are selected. Areas not suited for large irrigation systems still have adequate vegetation to support quail and rabbit populations.

Wetland habitats support a variety of furbearers, such as otter, beaver, and raccoon. The best wetland habitat available in Worth County is bottom land hardwoods along the Flint and Ochlockonee Rivers, Abrams Creek, Daniels Creek, Horse Creek, Tucks Creek, Ty Ty Creek, and Warrior Creek. Worth County has about 80,000 acres of forested wetland, about 400 small ponds, and about 230 miles of streams.

Important freshwater sport fish in this county include largemouth bass, crappie, channel catfish, bluegill, and redear sunfish. Anadromous sport fish species are striped bass and shad.

Because of the fragile habitat requirements of fish, special efforts are needed to restrict and retard both point and nonpoint sources of water pollution in Worth County.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants (fig. 8).

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

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

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

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and

Figure 8.—Bicolor lespedeza and cowpeas used in a wildlife food plot on Wagram loamy sand, 0 to 5 percent slopes.

features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

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

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

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

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

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

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

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

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

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

Habitat for wetland wildlife consists of open, marshy, or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

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

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

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

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

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

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

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

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

Building Site Development

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

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

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

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

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

Sanitary Facilities

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

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

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

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel are less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

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

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope can cause construction problems.

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

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

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

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

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

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

Construction Materials

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

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

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

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

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

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

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

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source.

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

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

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel or soluble salts, or soils that have slopes of 8 to 12 percent. The soils are not so wet that excavation is difficult.

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

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and releases a variety of plant-available nutrients as it decomposes.

Water Management

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

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

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

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

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

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

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

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

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope and wetness affect the construction of terraces and diversions. Restricted permeability adversely affect maintenance.

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

Soil Properties

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

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

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas *(13)*. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

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

Engineering Index Properties

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

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

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

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

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

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

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

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

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

Physical and Chemical Properties

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

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

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They influence the soil's adsorption of cations, moisture retention, shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

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

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

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

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

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

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

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

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion. Losses are expressed in tons per acre per year. These estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur over a sustained period without affecting crop productivity. The rate is expressed in tons per acre per year.

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

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

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

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

Hydrologic soil groups are used to estimate runoff from precipitation. Soils are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

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

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

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

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

In table 17, some soils are assigned to two hydrologic soil groups. Soils that have a seasonal high water table but can be drained are assigned first to a hydrologic soil group that denotes the drained condition of the soils and then to hydrologic group that denotes the undrained condition, for example, B/D. Because there are different degrees of drainage and water table control, onsite investigation is needed to determine the hydrologic group of the soil in a particular location.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

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

Frequency, duration, and probable dates of occurrence are estimated. Frequency generally is expressed as *none, occasional,* or *frequent. None* means that flooding is not probable. *Occasional* means that flooding occurs infrequently under normal weather conditions (there is a 5 to 50 percent chance of flooding in any year). *Frequent* means that flooding occurs often under normal weather conditions (there is more than a 50 percent chance of flooding in any year). Duration is expressed as *very brief* (less than 2 days) and as *brief* (2 to 7 days). The time of year that floods are most likely to occur is expressed in months. November-April, for example, means that flooding can occur during the period November through April. About two-thirds to three-fourths of all flooding occurs during the stated period.

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

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

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

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

The two numbers in the "High water table-Depth" column indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. "More than 6.0" indicates that the water table is below a depth of 6 feet or that the water table exists for less than a month.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severely corrosive environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

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

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

Physical and Chemical Analyses of Selected Soils

The results of physical and chemical analysis for a typical pedon of the Orangeburg series are available in the Georgia State Office of the Soil Conservation Service. The pedon is typical of the series as described in the section "Soil Series and Their Morphology." Soil samples were analyzed by the National Soil Survey Laboratory, Soil Conservation Service, Lincoln, Nebraska.

Most determinations, except those for grain-size analysis and bulk density, were made on soil material smaller than 2 millimeters in diameter. Measurements reported as percent or quantity of unit weight were calculated on an oven-dry basis. The methods used in obtaining the data accompany the results of the analysis.

Engineering Index Test Data

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

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

The tests and methods are: AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 423 (ASTM); Plasticity index—T 90 (AASHTO), D 424 (ASTM); Moisture density, Method A—T 99 (AASHTO), D 698 (ASTM); Volume change (Abercrombie)—Georgia Highway Standard.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(14)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or on laboratory measurements. Table 19 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders, primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Fluvaquents (*Fluv*, meaning flood plains, plus *aquent*, the suborder of the Entisols that has an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Fluvaquents.

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

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. There can be some variation in the texture of the surface layer or of the substratum within a series. An example is the Kinston series, which is a member of the fine-loamy, siliceous, acid, thermic family of Typic Fluvaquents.

Soil Series and Their Morphology

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

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual (12)*. Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (14)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

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

Albany Series

The Albany series consists of somewhat poorly drained soils that formed in sandy and loamy marine sediment on the uplands. These soils are rapidly permeable in the surface layer and in the thick subsurface layer and are moderately permeable in the subsoil. A seasonal high water table is at a depth of 1.5 to 2.5 feet generally in winter and early in the spring. The slope is 0 to 2 percent. Albany soils are loamy, siliceous, thermic Grossarenic Paleudults.

Albany soils are geographically associated with Lakeland, Ocilla, and Pelham soils. Lakeland soils are excessively drained. They are sandy throughout and generally are in higher positions on the landscape than Albany soils. Ocilla soils have an arenic epipedon. Pelham soils are poorly drained. They have an arenic epipedon and generally are in lower positions on the landscape than Albany soils.

Typical pedon of Albany sand, 0 to 2 percent slopes; 2 miles northwest on Georgia State Highway 256 from New Hope Baptist Church; on the northeast side of the road.

Ap—0 to 6 inches; dark gray (10YR 4/1) sand; single grained; loose; many fine roots; strongly acid; abrupt wavy boundary.

E1—6 to 20 inches; light yellowish brown (10YR 6/4) sand; few medium distinct yellowish brown (10YR 5/6) mottles; single grained; loose; common fine roots in upper part; strongly acid; clear wavy boundary.

E2—20 to 40 inches; light yellowish brown (10YR 6/4) sand; common medium distinct yellowish brown (10YR 5/6) and light gray (10YR 7/2) mottles; single grained; loose; very strongly acid; gradual wavy boundary.

E3—40 to 53 inches; light yellowish brown (10YR 6/4) sand; many medium distinct light gray (10YR 7/2) and yellowish brown (10YR 5/6) mottles; single grained; loose; very strongly acid; gradual wavy boundary.

Bt1—53 to 64 inches; mottled pale brown (10YR 6/3), light gray (10YR 7/1), and yellowish brown (10YR 5/6) sandy loam; weak fine subangular blocky structure; friable; few gray uncoated sand lenses; very strongly acid; gradual wavy boundary.

Bt2—64 to 80 inches; mottled light yellowish brown (10YR 6/4), light gray (10YR 7/1), and yellowish brown (10YR 5/6) sandy clay loam; weak fine subangular blocky structure; friable; few faint clay films on faces of peds; very strongly acid.

The thickness of the solum is 80 inches or more. The reaction is very strongly acid or strongly acid except in areas where the surface layer has been limed.

The sandy epipedon is 40 to 55 inches thick. The Ap or A horizon is 6 to 8 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 1 or 2.

The E horizon is 34 to 47 inches thick. It has hue of 10YR, value of 5 or 6, and chroma of 4, 6, or 8. This horizon has few or common grayish, yellowish, or brownish mottles.

The Bt horizon is mottled and has hue of 10YR, value of 5 to 7, and chroma of 1, 2, 3, 4, 6, or 8. In some pedons, the Bt horizon has a brown or gray matrix that has common or many reddish, brownish, and grayish mottles. The texture of the Bt horizon is sandy loam or sandy clay loam.

Carnegie Series

The Carnegie series consists of well drained soils that formed mainly in clayey marine sediment on the uplands. These soils are moderately permeable in the upper part of the subsoil and moderately slowly permeable in the lower part. The slope is 3 to 8 percent. Carnegie soils are clayey, kaolinitic, thermic Plinthic Paleudults.

Carnegie soils are geographically associated with Esto and Tifton soils. Esto soils have a subsoil that does not consist of 5 percent or more plinthite. Tifton soils are in a fine-loamy family and are made up of 5 percent or more plinthite at a depth of more than 30 to 50 inches.

Typical pedon of Carnegie gravelly sandy loam, 3 to 5 percent slopes; 0.6 mile north of Acree on Dougherty-Worth County line road; 40 feet east of the center of the road.

Apc—0 to 6 inches; dark brown (7.5YR 4/4) gravelly sandy loam; weak fine granular structure; very friable; 25 percent ironstone nodules; many fine roots; slightly acid; abrupt wavy boundary.

Btc—6 to 9 inches; yellowish red (5YR 4/6) sandy clay loam; moderate fine subangular blocky structure; friable; few fine roots; 14 percent ironstone nodules; strongly acid; clear wavy boundary.

Bt—9 to 19 inches; yellowish red (5YR 4/6) sandy clay; moderate medium subangular blocky structure; firm; thin patchy clay films on faces of peds; 3 percent ironstone nodules; strongly acid; clear wavy boundary.

Btv—19 to 29 inches; yellowish red (5YR 4/6) sandy clay; moderate medium subangular blocky structure; firm; 10 percent plinthite; few distinct clay films on faces of peds; 2 percent ironstone nodules; strongly acid; clear wavy boundary.

B't1—29 to 46 inches; yellowish red (5YR 4/6) sandy clay; common medium distinct red (2.5YR 4/6), strong brown (7.5YR 5/6), and light gray (10YR 7/1) mottles; moderate medium subangular blocky structure; firm; 2 percent plinthite; few faint patchy clay films; strongly acid; clear wavy boundary.

B't2—46 to 70 inches; mottled yellowish red (5YR 4/6), red (2.5YR 4/6), strong brown (7.5YR 5/6), and light gray (10YR 7/1) sandy clay; moderate medium subangular blocky structure; firm; few faint patchy clay films; strongly acid.

The thickness of the solum is 60 inches or more. The reaction is strongly acid or very strongly acid except in areas where the surface layer has been limed. Depth to the horizon containing 5 percent or more plinthite is 16 to 22 inches. Plinthite ranges from 5 to 12 percent.

The Apc horizon is 4 to 8 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 2 to 4; or hue of 7.5YR, value of 3 or 4, and chroma of 2 or 4. Ironstone nodules range from 5 to 25 percent, by volume. The texture of the A horizon is gravelly sandy loam or sandy loam.

The Btc horizon has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8. Ironstone nodules range from 5 to 15 percent. The Bt horizon has hue of 5YR, value of 4 or 5, and chroma of 6 or 8. The Btv horizon has hue of 5YR, 7.5YR, or 2.5YR, value of 4 or 5, and chroma of 6 or 8. Plinthite ranges from 5 to 12 percent. The B't horizon is mottled in shades of red, gray, yellow, or brown. The grayish mottles are lithochromic and do not represent wetness.

Clarendon Series

The Clarendon series consists of moderately well drained soils that formed mainly in loamy marine sediment on the uplands. These soils are moderately permeable in the upper part of the subsoil and moderately slowly permeable in the lower part. A seasonal high water table is at a depth of 1.5 to 2.5 feet generally in winter and early in the spring. The slope is 0 to 2 percent. Clarendon soils are fine-loamy, siliceous, thermic Plinthaquic Paleudults.

Clarendon soils are geographically associated with Leefield, Pelham, and Stilson soils. The associated soils have an arenic epipedon. In addition, Pelham soils are poorly drained. They are in depressions and near the upper part of drainageways. Leefield soils are somewhat poorly drained.

Typical pedon of Clarendon loamy sand, 0 to 2 percent slopes; 1.3 miles southwest of Sylvester on Georgia State Highway 112; 2,000 feet southeast of highway.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable; common fine roots; few ironstone nodules; slightly acid; abrupt wavy boundary.

Bt1—8 to 13 inches; light yellowish brown (10YR 6/4) sandy loam; weak fine subangular blocky structure; friable; common fine roots; few ironstone nodules; strongly acid; clear wavy boundary.

Bt2—13 to 24 inches; yellowish brown (10YR 5/6) sandy clay loam; few medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; few faint clay films on faces of peds and in pores; few ironstone nodules; very strongly acid; gradual wavy boundary.

Btv1—24 to 44 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct gray (10YR 6/1), yellowish red (5YR 4/6), and strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; 5 percent plinthite; few distinct clay films on faces of peds and in pores; few ironstone nodules; very strongly acid; gradual wavy boundary.

Btv2—44 to 65 inches; coarsely mottled red (2.5YR 4/6), light gray (10YR 7/1), and yellowish brown (10YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable; about 10 percent plinthite; few distinct clay films on faces of peds and in pores; very strongly acid.

The thickness of the solum is 60 inches or more. The reaction is very strongly acid or strongly acid except in areas where the surface layer has been limed. Depth to the horizon containing 5 percent or more plinthite is 24 to 65 inches. Plinthite ranges from 6 to 15 percent to a depth of 60 inches or more.

The Ap horizon is 7 to 9 inches thick. It has hue of 10YR, value of 4, and chroma of 1 or 2. Ironstone nodules are few or common.

Some pedons have an E horizon that has hue of 10YR, value of 5 or 6, and chroma of 4. Ironstone nodules are few or common.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 4 or 6. The lower part of the Bt horizon is mottled in shades of red, brown, yellow, or gray. The grayish mottles are at a depth of 20 to 30 inches. The upper part of the Btv horizon is yellowish brown, and it has reddish, brownish, or grayish mottles.

Cowarts Series

The Cowarts series consists of well drained soils that formed in loamy marine sediment on the uplands. These soils are moderately permeable in the subsoil and moderately slowly permeable or slowly permeable in the substratum. The slope is 2 to 12 percent. Cowarts soils are fine-loamy, siliceous, thermic Typic Hapludults.

Cowarts soils are geographically associated with Carnegie and Esto soils. The associated soils are in a clayey family and have a thicker solum than Cowarts soils. In addition, some parts of the subsoil of Carnegie soils are made up of 5 percent or more plinthite.

Typical pedon of Cowarts loamy sand, 2 to 5 percent slopes; 1 mile south of Sylvester on Georgia State Highway 112, 1.6 miles west of hospital on paved road, 1 mile south on dirt road, 300 feet west on dirt road; on north side of the road.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable; common fine roots; strongly acid; clear smooth boundary.

E—7 to 10 inches; yellowish brown (10YR 5/4) loamy sand; weak fine granular structure; very friable; common fine roots; strongly acid; clear smooth boundary.

Bt1—10 to 14 inches; strong brown (7.5YR 5/6) sandy loam; weak fine granular structure; friable; few fine roots; strongly acid; clear smooth boundary.

Bt2—14 to 26 inches; strong brown (7.5YR 5/6) sandy clay loam; weak fine subangular blocky structure;

friable; few faint clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt3—26 to 36 inches; yellowish brown (10YR 5/6) sandy clay loam; moderate medium subangular blocky structure; firm; few distinct clay films on faces of peds; strongly acid; abrupt smooth boundary.

C—36 to 65 inches; mottled yellowish brown (10YR 5/4), red (2.5YR 5/6), light gray (10YR 7/2), and brownish yellow (10YR 6/8) sandy clay loam that has coarse sandy loam strata; massive; extremely firm and compact; strongly acid.

The thickness of the solum is 25 to 37 inches. The reaction is strongly acid or very strongly acid except in areas where the surface layer has been limed.

The A horizon is 4 to 10 inches thick. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Ironstone nodules make up 2 to 4 percent of the horizon in some pedons.

Some pedons have an E horizon that has hue of 10YR, value of 4 to 6, and chroma of 4; or it has hue of 2.5Y, value of 5, and chroma of 2.

The Bt horizon has hue of 10YR, 7.5YR, or 5YR, value of 5 or 6, and chroma of 4, 6, or 8. In some pedons, ironstone nodules make up as much as 3 percent of the upper part of the subsoil. In some pedons, the lower part of the Bt horizon has many medium or coarse reddish, yellowish, or brownish mottles.

The C horizon is mottled and has hue of 2.5YR and 10YR, value of 4 to 8, and chroma of 1, 2, 3, 4, 6, or 8; or hue of 7.5YR, value of 4 to 8, and chroma of 2, 4, 6, or 8. The texture of this horizon is sandy clay loam or sandy loam that is dense in place. Commonly, pockets and layers of a sandier or finer material are in the C horizon.

Coxville Series

The Coxville series consists of poorly drained soils that formed in clayey marine sediment in depressions on the uplands. These soils are slowly permeable. They are commonly ponded, or they have a seasonal high water table at a depth of 1.5 feet or less generally from late in the fall to midspring. The slope is 0 to 2 percent. Coxville soils are clayey, kaolinitic, thermic Typic Paleaquults.

Coxville soils are geographically associated with Clarendon, Dothan, Stilson, and Tifton soils. The associated soils are in higher positions on the landscape than Coxville soils. These soils contain plinthite and surround the Coxville soils. Clarendon and Stilson soils are moderately well drained, and Dothan soils are well drained. In addition, Clarendon, Dothan, and Tifton soils are in a fine-loamy family, and Stilson soils have an arenic epipedon.

Typical pedon of Coxville fine sandy loam; 3.5 miles north on Dougherty-Worth County line gravel road from junction of U.S. Highway 82, 1,300 feet east of road; in large depressional area.

A—0 to 6 inches; very dark gray (10YR 3/1) fine sandy loam; weak medium granular structure; very friable; many fine roots; very strongly acid; abrupt smooth boundary.

Btg1—6 to 12 inches; gray (10YR 6/1) sandy clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; many fine roots; very strongly acid; clear wavy boundary.

Btg2—12 to 50 inches; gray (10YR 6/1) sandy clay; many medium distinct yellowish brown (10YR 5/6) mottles and common medium distinct red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; firm; common fine pores; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg3—50 to 65 inches; gray (10YR 6/1) sandy clay; common medium distinct yellowish brown (10YR 5/6) mottles and few medium distinct strong brown (7.5YR 5/8) and yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; firm; few faint clay films on faces of peds; very strongly acid.

The thickness of the solum is 60 inches or more. The reaction is very strongly acid or strongly acid.

The A horizon is 5 to 8 inches thick. The Ap or A horizon has hue of 10YR, value of 2 or 3, and chroma of 1.

Some pedons have an E horizon that has hue of 10YR, value of 5 or 6, and chroma of 1 or 2.

The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1. This horizon has few to many brownish, yellowish, or reddish mottles. The texture of this horizon is sandy clay or sandy clay loam in the upper few inches and is sandy clay or clay below that layer.

Dothan Series

The Dothan series consists of well drained soils that formed mainly in loamy marine sediment on the uplands. These soils are moderately permeable in the upper part of the subsoil and moderately slowly permeable in the lower part. The slope is 0 to 5 percent. Dothan soils are fine-loamy, siliceous, thermic Plinthic Paleudults.

Dothan soils are geographically associated with Fuquay, Stilson, and Tifton soils. Fuquay and Stilson soils have an arenic epipedon. In addition, Stilson soils are moderately well drained and are in lower-lying, smoother areas than Dothan soils. Tifton soils have more ironstone nodules throughout.

Typical pedon of Dothan loamy sand, 2 to 5 percent slopes; 3 miles east of Sumner on U.S. Highway 82, 1.25 miles south of U.S. Highway 82 on dirt road, 1 mile southwest on dirt road, 0.5 mile north on dirt road; 100 feet east of the road.

Ap—0 to 9 inches; grayish brown (10YR 5/2) loamy sand; weak fine granular structure; very friable; many fine roots; few ironstone nodules; medium acid; abrupt smooth boundary.

Bt1—9 to 15 inches; yellowish brown (10YR 5/4) sandy loam; weak medium subangular blocky structure; friable; common fine roots; few ironstone nodules; strongly acid; clear wavy boundary.

Bt2—15 to 35 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; few fine roots and pores; few distinct clay films on faces of peds; few clean sand grains; few ironstone nodules; very strongly acid; gradual wavy boundary.

Btv1—35 to 44 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium prominent red (2.5YR 4/6) mottles and common medium distinct very pale brown (10YR 7/3) mottles; moderate medium subangular blocky structure; friable; common fine pores; 8 percent plinthite; few distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btv2—44 to 65 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium prominent white (10YR 8/2), red (2.5YR 4/6), and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; compact in place; common fine pores; 6 percent plinthite; few distinct clay films on faces of peds; very strongly acid.

The thickness of the solum is 60 inches or more. The reaction is strongly acid or very strongly acid except in areas where the surface layer has been limed. Depth to the horizon that contains 5 percent or more plinthite is 32 to 44 inches. Plinthite ranges from 5 to 15 percent to a depth of 60 inches or more.

The Ap horizon is 8 to 10 inches thick. It has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2. Ironstone nodules make up 1 to 4 percent, by volume.

Some pedons have an E horizon that has hue of 10YR, value of 4 to 6, and chroma of 2 to 4; or hue of 2.5Y, value of 4 to 6, and chroma of 2 or 4.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 6 or 8. The texture of this horizon is dominantly sandy clay loam but ranges to sandy loam. In most pedons, the lower part of the Bt horizon has many medium and coarse white and brownish, yellowish, reddish, and grayish mottles. Ironstone nodules make up less than 5 percent of the upper part of the Bt horizon.

Esto Series

The Esto series consists of well drained soils that formed mainly in clayey marine sediment on the uplands. These soils are slowly permeable. The slope is 2 to 12 percent. Esto soils are clayey, kaolinitic, thermic, Typic Paleudults.

Esto soils are geographically associated with Carnegie, Cowarts, and Susquehanna soils. Carnegie soils have a subsoil that is 5 percent or more plinthite at a depth of more than 18 inches. Cowarts soils are in a fine-loamy family and have a thinner solum than Esto soils. Susquehanna soils are somewhat poorly drained. They have a subsoil that is very firm and very plastic.

Typical pedon of Esto loamy sand, 2 to 5 percent slopes; 0.5 mile generally northeast of Warwick on county road from Georgia State Highway 313; 40 feet south of the road.

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

Bt1—5 to 9 inches; strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; common fine roots; very strongly acid; clear smooth boundary.

Bt2—9 to 13 inches; strong brown (7.5YR 5/6) sandy clay; moderate medium subangular blocky structure; firm; few fine roots; few faint clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt3—13 to 29 inches; yellowish brown (10YR 5/6) clay; common medium distinct red (2.5YR 4/8), light gray (2.5Y 7/2), and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; common distinct clay films on faces of peds; very strongly acid; gradual smooth boundary.

Bt4—29 to 62 inches; mottled light gray (10YR 7/1), red (2.5YR 4/8), yellowish brown (10YR 5/6), and strong brown (7.5YR 5/6) clay; strong medium subangular blocky structure; firm; common distinct clay films on faces of peds; very strongly acid.

The thickness of the solum is 60 inches or more. The reaction is very strongly acid or strongly acid except in areas where the surface layer has been limed.

The A horizon is 3 to 7 inches thick. It has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. Some pedons have ironstone nodules that make up as much as 3 percent of the A horizon.

Some pedons have an E horizon that is loamy sand and has hue of 10YR, value of 5, and chroma of 4.

The upper part of the Bt horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4, 6, or 8. The texture of this part of the Bt horizon is sandy clay loam or sandy clay. The remainder of the Bt horizon has hue of 10YR, 7.5YR, or 5YR, value of 5 or 6, and chroma of 4, 6, or 8; or it has hue of 10YR, 7.5YR, or 5YR, value of 4, and chroma of 4 or 6. Commonly, this part of the Bt horizon has few to many yellowish, brownish, and reddish mottles; but in some pedons, it is mottled in shades of gray, yellow, brown, or red. The texture of this part of the Bt horizon is sandy clay or clay.

Freemanville Series

The Freemanville series consists of well drained soils that formed in clayey marine sediment on the uplands. These soils are moderately permeable in the upper part of the subsoil and moderately slowly permeable in the lower part. The slope is 2 to 5 percent. Freemanville soils are clayey, kaolinitic, thermic Plinthic Paleudults.

Freemanville soils are geographically associated with Carnegie, Clarendon, and Tifton soils. Carnegie soils have 5 percent or more plinthite between depths of 18 and 22 inches. Clarendon and Tifton soils are in a fine-loamy family. They are moderately well drained.

Typical pedon of Freemanville sandy loam, 2 to 5 percent slopes; 2.5 miles east of Dougherty County line on Jewel Crowe Road; 225 feet south of road.

Apc—0 to 10 inches; dark brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; many fine roots; 10 percent ironstone nodules; slightly acid; abrupt smooth boundary.

Btc1—10 to 14 inches; yellowish red (5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; 14 percent ironstone nodules; strongly acid; clear smooth boundary.

Btc2—14 to 29 inches; yellowish red (5YR 5/8) sandy clay; moderate medium subangular blocky structure; firm; few distinct clay films on faces of peds; 15 percent ironstone nodules; strongly acid; gradual wavy boundary.

Btcv—29 to 46 inches; yellowish red (5YR 5/8) sandy clay; moderate medium subangular blocky structure; firm; 10 percent plinthite; few prominent clay films on faces of peds; 10 percent ironstone nodules; strongly acid; gradual wavy boundary.

Btv—46 to 70 inches; yellowish red (5YR 5/8) sandy clay; few fine distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; 15 percent plinthite; few prominent clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt—70 to 96 inches; yellowish red (5YR 5/8) sandy clay loam; common medium distinct strong brown (7.5YR 5/6) and gray (10YR 6/1) mottles; weak medium subangular blocky structure; firm; few faint clay films on faces of peds; strongly acid.

The thickness of the solum is 60 inches or more. The reaction is strongly acid except in areas where the surface layer has been limed. Depth to horizons containing 5 percent or more plinthite is 29 to 50 inches. Plinthite ranges from 5 to 14 percent to a depth of 60 inches or more. Ironstone nodules range from 10 to 14 percent in the surface layer and from 2 to 14 percent in the upper part of the subsoil.

The Ap horizon is 8 to 11 inches thick. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3.

The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. The lower part of the Bt horizon is mottled in shades of brown, yellow, or gray.

Fuquay Series

The Fuquay series consists of well drained soils that formed in sandy and loamy marine sediment on the uplands. These soils are moderately permeable in the upper part of the subsoil and slowly permeable in the lower part. The slope is 0 to 8 percent. Fuquay soils are loamy, siliceous, thermic Arenic Plinthic Paleudults.

Fuquay soils are geographically associated with Dothan, Lakeland, and Stilson soils. Dothan soils have a sandy epipedon less than 20 inches thick. Lakeland soils are sandy throughout. Stilson soils are moderately well drained. They commonly are in lower-lying, smoother areas on the uplands than Fuquay soils.

Typical pedon of Fuquay loamy sand, 0 to 5 percent slopes; 1.5 miles southwest of New Hope Church on Georgia State Highway 256, 1 mile east on county paved road; 0.5 mile southeast of the county road.

Ap—0 to 8 inches; grayish brown (10YR 5/2) loamy sand; weak fine granular structure; very friable; many fine roots; few small ironstone nodules; strongly acid; abrupt smooth boundary.

E—8 to 26 inches; light yellowish brown (10YR 6/4) loamy sand; weak fine granular structure; very friable; many fine roots; few small ironstone nodules; very strongly acid; clear wavy boundary.

Bt1—26 to 38 inches; yellowish brown (10YR 5/8) sandy loam; weak fine subangular blocky structure; very friable; few fine roots; few small ironstone nodules; very strongly acid; clear wavy boundary.

Bt2—38 to 48 inches; yellowish brown (10YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; common fine pores; few distinct clay films on faces of peds; few small ironstone nodules; very strongly acid; gradual wavy boundary.

Btv1—48 to 62 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium prominent red (2.5YR 4/6) mottles and common medium distinct light gray (10YR 7/2) mottles; weak medium subangular blocky structure; firm; common fine pores; about 8 percent plinthite; few distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btv2—62 to 80 inches; reticulately mottled brownish yellow (10YR 6/6), red (2.5YR 4/8), light gray (10YR 7/1), and yellowish red (5YR 4/8) sandy clay loam; weak medium subangular blocky structure; firm; few fine pores; about 6 percent plinthite; few distinct clay films on faces of peds; very strongly acid.

The thickness of the solum is 80 inches or more. The reaction is very strongly acid or strongly acid except in areas where the surface layer has been limed. Depth to the horizon containing 5 percent or more plinthite is 40 to 56 inches. Plinthite ranges from 5 to 8 percent to a depth of 80 inches or more.

The sandy epipedon is 20 to 40 inches thick. The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 3, 4, or 6. In some pedons, ironstone nodules are few in the sandy epipedon.

The Bt horizon has hue of 7.5YR or 10YR, value of 5, and chroma of 4, 6, or 8; or it has hue of 5YR, value of 5, and chroma of 8. Few or common ironstone nodules are in the upper part of the Bt horizon. The lower part of the Bt horizon has few to many brownish, reddish, and grayish mottles, or it is reticulately mottled with these colors.

Herod Series

The Herod series consists of poorly drained soils that formed in loamy alluvial sediment on the flood plains. These soils are moderately permeable. A seasonal high water table is at a depth of 0.5 foot to 1.5 feet generally from late in the fall to early in the spring. The slope is 0 to 2 percent. Herod soils are fine-loamy, siliceous, nonacid, thermic Typic Fluvaquents.

Herod soils are geographically associated with Lucy, Orangeburg, Tifton, and Wagram soils. The associated soils are well drained and are on the uplands.

Typical pedon of Herod sandy loam, frequently flooded; 0.7 mile east of Oakfield on dirt road, 1.2 miles south on Iron Bridge Road; 50 feet west of bridge crossing Jones Creek.

A1—0 to 3 inches; very dark gray (10YR 3/2) sandy loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

A2—3 to 10 inches; grayish brown (10YR 5/2) sandy loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear wavy boundary.

Cg1—10 to 20 inches; gray (10YR 5/1) sandy clay loam; few fine distinct brownish yellow (10YR 6/6) mottles; massive in place, parting to weak fine subangular blocky structure; friable; few medium roots; few thin strata of sand; medium acid; gradual wavy boundary.

Cg2—20 to 36 inches; gray (10YR 6/1) sandy clay loam; common medium distinct brownish yellow (10YR 6/6) and brown (10YR 5/3) mottles; massive in place, parting to weak medium subangular blocky structure; firm; neutral; few thin strata of sand; gradual wavy boundary.

Cg3—36 to 60 inches; gray (10YR 6/1) sandy clay loam; common fine distinct yellowish brown (10YR 5/6) and pale brown (10YR 6/3) mottles; massive in place, parting to weak medium subangular blocky structure; firm; few thin strata of sand in lower part; neutral.

The sediment is 60 inches or more thick. The reaction is strongly acid in the A horizon and is medium acid to neutral in the the C horizon. The clay content of the 10- to 40-inch control section is 18 to 35 percent.

The A1 horizon is 2 to 4 inches thick. It has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. The A2 horizon is 4 to 7 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 1 or 2.

The Cg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It has few or common grayish, brownish, and yellowish mottles. Thin sand or clay strata are common in the Cg horizon in some pedons; however, the texture is mostly sandy clay loam in the control section. In some pedons, the texture below the control section is fine sand, sand, or sandy loam.

Hornsville Series

The Hornsville series consists of moderately well drained soils that formed mainly in clayey sediment on stream terraces. These soils are moderately slowly permeable. A seasonal high water table is at a depth of 2.5 to 3.5 feet generally in winter to midspring. The slope is 0 to 2 percent. Hornsville soils are clayey, kaolinitic, thermic Aquic Hapludults.

Hornsville soils are geographically associated with Kinston and Wahee soils. Kinston soils are poorly drained and are loamy throughout. These soils are on the flood plains. Wahee soils are somewhat poorly drained.

Typical pedon of Hornsville fine sandy loam, 0 to 2 percent slopes; on Mercer Mill Plantation, 900 feet north of privately owned Abrams Creek Bridge; 900 feet east of the Flint River.

A—0 to 3 inches; dark gray (10YR 4/1) fine sandy loam; weak fine granular structure; very friable; many fine roots; slightly acid; abrupt smooth boundary.

E—3 to 11 inches; brown (10YR 5/3) fine sandy loam; weak fine granular structure; very friable; many fine roots; medium acid; clear smooth boundary.

Bt1—11 to 16 inches; yellowish brown (10YR 5/6) sandy clay loam; weak fine subangular blocky structure; firm; few fine roots; strongly acid; clear wavy boundary.

Bt2—16 to 23 inches; yellowish red (5YR 5/6) clay; common fine prominent light yellowish brown (10YR 6/4) mottles; moderate medium subangular blocky structure; firm; common distinct clay films on faces of peds; strongly acid; clear wavy boundary.

Bt3—23 to 36 inches; mottled yellowish red (5YR 5/6), strong brown (7.5YR 5/6), red (2.5YR 4/6), and gray (10YR 6/1) clay; strong medium subangular blocky structure; firm; common prominent clay films on faces of peds; strongly acid; clear wavy boundary.

BC1—36 to 52 inches; mottled strong brown (7.5YR 5/6), gray (10YR 6/1), yellowish red (5YR 5/6), and red (2.5YR 4/6) sandy clay loam; weak fine subangular blocky structure; firm; thin stratified layers of sandy loam; strongly acid; clear wavy boundary.

BC2—52 to 82 inches; mottled gray (10YR 6/1) and strong brown (7.5YR 5/8) sandy loam; weak fine granular structure; friable; strongly acid.

The thickness of the solum is 42 to 60 inches or more. The reaction is strongly acid except in areas where the surface layer and subsurface layer have been limed.

The A horizon is 3 to 5 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 1 or 2.

In some pedons, the E horizon has hue of 10YR, value of 5 or 6, and chroma of 3.

The upper part of the Bt horizon has hue of 10YR, 7.5YR, or 5YR, value of 4 or 5, and chroma of 4 or 6. The lower part of the Bt horizon has hue of 10YR or 5YR, value of 5 or 6, and chroma of 4, 6, or 8; hue of 10YR or 5YR, value of 4, and chroma of 4 or 6; or it is mottled in shades of red, brown, yellow, or gray. Mottles that have chroma of 2 or less are within 24 inches of the top of the argillic horizon. The texture of the Bt horizon is mainly sandy clay or clay. The BC horizon has hue of 10YR, value of 5 to 8, and chroma of 1, 2, 3, 4, 6, or 8; or it is mottled in shades of red, brown, yellow, or gray. The texture of the BC horizon is sandy clay loam or sandy loam.

Some pedons have a sandy C horizon that has hue of 10YR, value of 7 or 8, and chroma of 1 or 2. This horizon has yellowish mottles, or it is mottled in shades of yellow or gray.

Kinston Series

The Kinston series consists of poorly drained soils that formed in loamy alluvial sediment on the flood plains. These soils are moderately permeable. A seasonal high water table is within 1 foot of the surface generally from midfall to late in the spring. The slope is 0 to 2 percent. Kinston soils are fine-loamy, siliceous, acid, thermic Typic Fluvaquents.

Kinston soils are geographically associated with Cowarts and Tifton soils. The associated soils are well drained. They are on the uplands.

Typical pedon of Kinston fine sandy loam, frequently flooded; about 5.75 miles generally east of Anderson City to bridge over Warrior Creek, 300 feet northeast on paved road from bridge; northwest side of road.

A—0 to 6 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; abrupt wavy boundary.

Ag—6 to 12 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; common medium roots; very strongly acid; clear wavy boundary.

Cg1—12 to 18 inches; light gray (10YR 6/1) sandy loam; common fine distinct brownish yellow (10YR 6/6) mottles; weak fine granular structure; friable; common medium roots; very strongly acid; gradual wavy boundary.

Cg2—18 to 48 inches; gray (10YR 5/1) sandy clay loam; common medium distinct light gray (10YR 7/1) and brownish yellow (10YR 6/6) mottles; massive in place, parting to weak fine subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

Cg3—48 to 60 inches; light gray (10YR 6/1) sandy clay loam; few sand lenses in lower part of horizon; common fine distinct yellowish brown (10YR 5/8), brownish yellow (10YR 6/6), and light gray (10YR 7/1) mottles; massive in place, parting to weak fine subangular blocky structure; friable; very strongly acid; abrupt wavy boundary.

Cg4—60 to 66 inches; light gray (10YR 6/1) sand; common fine distinct brownish yellow (10YR 6/6) mottles; single grained; loose; very strongly acid.

The thickness of the loamy sediment is 40 inches or more. The reaction is strongly acid or very strongly acid.

The A horizon is 8 to 12 inches thick. It has hue of 10YR, value of 3 to 5, and chroma of 1 or 2; if the value is 3, that part of the A horizon is not more than 6 inches thick.

The Cg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It has few to many grayish, brownish, and yellowish mottles. The texture of the Cg horizon is fine sandy loam, sandy loam, or sandy clay loam at a depth of less than 40 inches and has a weighted average of 20 to 35 percent clay. The texture of the Cg horizon is loamy or sandy at a depth of more than 40 inches.

Lakeland Series

The Lakeland series consists of excessively drained soils that formed in sandy marine sediment on the uplands. These soils are very rapidly permeable. The slope is 0 to 5 percent. Lakeland soils are thermic, coated Typic Quartzipsamments.

Lakeland soils are geographically associated with Albany, Cowarts, and Fuquay soils. Albany soils are in smooth areas. They are somewhat poorly drained and have a grossarenic epipedon. Cowarts and Fuquay soils are well drained and have an argillic horizon. In addition, Fuquay soils have an arenic epipedon.

Typical pedon of Lakeland sand, 0 to 5 percent slopes; about 5.75 miles generally east of Anderson City to bridge over Warrior Creek, about 1.2 miles generally northeast on paved road from bridge, 0.8 mile southeast on county road, 1.2 miles generally south on field road; 600 feet south of field road.

Ap—0 to 6 inches; dark brown (10YR 4/3) sand; single grained; loose; many fine roots; slightly acid; clear smooth boundary.
C1—6 to 24 inches; yellowish brown (10YR 5/4) sand; single grained; loose; many fine roots; few uncoated sand grains; strongly acid; clear wavy boundary.
C2—24 to 40 inches; light yellowish brown (10YR 6/4) sand; single grained; loose; common uncoated sand grains; strongly acid; clear wavy boundary.
C3—40 to 60 inches; light yellowish brown (10YR 6/4) sand; common uncoated white (10YR 8/1) sand grains; single grained; loose; very strongly acid; clear wavy boundary.
C4—60 to 80 inches; pale brown (10YR 6/3) sand; single grained; loose; common uncoated white (10YR 8/1) sand grains; very strongly acid.

The thickness of the sand is 81 inches or more. The reaction is very strongly acid or strongly acid except in areas where the surface layer has been limed.

The A horizon is 3 to 6 inches thick. The Ap or A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4.

The C horizon has hue of 10YR, value of 5 or 6, and chroma of 3, 4, 6, or 8; or hue of 7.5YR or 5YR, value of 5, and chroma of 6 or 8. Small pockets of light gray or white sand at a depth of more than 40 inches are in some pedons.

Leefield Series

The Leefield series consists of somewhat poorly drained soils that formed in loamy and sandy marine sediment on the uplands. These soils are moderately permeable in the upper part of the subsoil and moderately slowly permeable in the lower part. A seasonal high water table is at a depth of 1.5 to 2.5 feet generally from late in the fall to early in the spring. The slope is 0 to 2 percent. Leefield soils are loamy, siliceous, thermic Arenic Plinthaquic Paleudults.

Leefield soils are geographically associated with Fuquay, Pelham, and Stilson soils. Fuquay soils are well drained. They are on nearby ridgetops and hillsides. Pelham soils are poorly drained. They are near the upper part of drainageways and in depressions on the uplands. Stilson soils are moderately well drained. They commonly are in somewhat higher, smoother areas than Leefield soils.

Typical pedon of Leefield loamy sand, 0 to 2 percent slopes; 2.25 miles east of Poulan on U.S. Highway 82, 0.7 mile south on field road; 100 feet east of field road.

Ap—0 to 7 inches; very dark gray (10YR 3/1) loamy sand; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt wavy boundary.
E—7 to 25 inches; light brownish gray (2.5Y 6/2) loamy sand; few medium faint pale yellow (2.5Y 7/4) mottles; weak fine granular structure; very friable; common fine and medium roots; very strongly acid; clear wavy boundary.
Bt1—25 to 31 inches; light yellowish brown (2.5Y 6/4) sandy loam; common medium distinct light gray (10YR 6/1) mottles; weak fine subangular blocky structure; friable; few fine roots; very strongly acid; gradual wavy boundary.
Bt2—31 to 41 inches; light yellowish brown (2.5Y 6/4) sandy clay loam; common medium distinct light gray (10YR 6/1) and brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable; few fine roots; few ironstone nodules; very strongly acid; gradual wavy boundary.
Btv1—41 to 54 inches; light yellowish brown (2.5Y 6/4) sandy clay loam; many medium distinct light gray (10YR 7/1) and yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; friable; 6 percent plinthite; sand grains coated and bridged with clay; few ironstone nodules; very strongly acid; gradual wavy boundary.
Btv2—54 to 60 inches; coarsely mottled yellowish brown (10YR 5/6), light gray (10YR 7/1), light yellowish brown (10YR 6/4), and red (2.5YR 4/6) sandy clay loam; weak medium subangular blocky structure; firm; 6 percent plinthite; few distinct patchy clay films on faces of peds; very strongly acid.

The thickness of the solum is 60 inches or more. The reaction is strongly acid or very strongly acid except in areas where the surface layer has been limed. Depth to the horizon containing 5 percent or more plinthite is 30 to 42 inches. Plinthite ranges from 5 to 12 percent to a depth of 60 inches.

The sandy epipedon is 20 to 40 inches thick. The Ap or A horizon is 7 to 12 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 1 or 2.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 4; or it has hue of 2.5Y, value of 5 or 6, and chroma of 2 or 4. Few or common mottles are in shades of gray or brown.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 or 6. It has common, medium or coarse, yellowish, brownish, and grayish mottles. In some pedons, this horizon has a few ironstone nodules. The Btv1 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 or 6. It has many or common, grayish or brownish mottles. The Btv2 horizon has the same colors as the above horizon, or it is mottled in shades of brown, yellow, or gray. In some pedons, this horizon has a few ironstone nodules.

Lucy Series

The Lucy series consists of well drained soils that formed in sandy and loamy marine sediment on the uplands. These soils are moderately rapidly permeable in the upper part of the soil and moderately permeable in the lower part. The Slope is 0 to 8 percent. Lucy soils are loamy, siliceous, thermic Arenic Paleudults.

Lucy soils are geographically associated with Norfolk and Orangeburg soils. Norfolk and Orangeburg soils do not have an arenic epipedon. In addition, Norfolk soils have a brownish solum.

Typical pedon of Lucy loamy sand, 0 to 5 percent slopes; 6 miles south of Oakfield on Georgia State Highway 300; 200 feet east of highway.

Ap—0 to 9 inches; brown (10YR 4/3) loamy sand; weak fine granular structure; very friable; many fine and few medium roots; strongly acid; clear smooth boundary.

E1—9 to 19 inches; strong brown (7.5YR 5/6) loamy sand; weak fine granular structure; very friable; common fine and few medium roots; mixing of Ap horizon in root holes; very strongly acid; clear smooth boundary.

E2—19 to 34 inches; yellowish red (5YR 5/8) loamy sand; weak fine granular structure; very friable; common fine and few medium roots; very strongly acid; clear smooth boundary.

Bt1—34 to 42 inches; yellowish red (5YR 4/8) sandy loam; weak fine subangular blocky structure; friable; few fine and medium roots; very strongly acid; gradual smooth boundary.

Bt2—42 to 72 inches; red (2.5YR 4/8) sandy clay loam; moderate medium subangular blocky structure; friable; few very fine roots; few faint clay films on faces of peds; very strongly acid.

The thickness of the solum is 72 inches or more. The reaction is strongly acid or very strongly acid except in areas where the surface layer has been limed.

The sandy epipedon is 21 to 36 inches thick. The Ap or A horizon is 6 to 10 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 2 or 3; or hue of 7.5YR, value of 3 or 4, and chroma of 2.

The E horizon has hue of 7.5YR, value of 4 or 5, and chroma of 4 or 6; hue of 7.5YR, value of 5, and chroma of 8; hue of 10YR, value of 4 or 5, and chroma of 3, 4, or 6; or hue of 10YR, value of 5, and chroma of 8.

Some pedons have a BE horizon that has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8. The texture of this BE horizon is loamy sand or loamy fine sand. The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8. The texture of this horizon is sandy loam or sandy clay loam.

Norfolk Series

The Norfolk series consists of well drained soils that formed mainly in loamy marine sediment on the uplands. These soils are moderately permeable. The slope is 0 to 5 percent. Norfolk soils are fine-loamy, siliceous, thermic Typic Paleudults.

Norfolk soils are geographically associated with Orangeburg soils. Orangeburg soils have a red Bt horizon.

Typical pedon of Norfolk loamy sand, 2 to 5 percent slopes; 1.5 miles south of Doles on Georgia State Highway 313, 1 mile east of highway on dirt road; 0.5 mile south of dirt road.

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

Bt1—8 to 15 inches; yellowish brown (10YR 5/6) sandy loam; weak fine subangular blocky structure; very friable; few fine roots; few ironstone nodules; strongly acid; gradual wavy boundary.

Bt2—15 to 32 inches; yellowish brown (10YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; few very fine roots; few faint clay films on faces of peds; few fine ironstone nodules; very strongly acid; gradual wavy boundary.

Bt3—32 to 48 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt4—48 to 65 inches; yellowish brown (10YR 5/8) sandy clay loam; common fine faint strong brown mottles; moderate medium subangular blocky structure; friable; few distinct clay films on faces of peds; very strongly acid.

The thickness of the solum is 65 inches or more. The reaction is very strongly acid or strongly acid except in areas where the surface layer has been limed. Some pedons may have ironstone nodules that make up as much as 3 percent of the horizon.

The A horizon is 8 to 10 inches thick. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

Some pedons have an E horizon that has hue of 10YR, value of 5 or 6, and chroma of 4.

Some pedons have a BE horizon that has hue of 10YR or 7.5YR, value of 5, and chroma of 6. The texture is sandy loam or loamy sand. The Bt horizon has hue of 7.5YR or 10YR, value of 5, and chroma of 6 or 8. Some pedons are mottled brown, yellowish brown, or red. Grayish mottles are at a depth of 40 inches or more in some pedons. The texture of the Bt horizon is sandy clay loam, but the upper few inches are sandy loam.

Ocilla Series

The Ocilla series consists of somewhat poorly drained soils that formed in sandy and loamy sediment on uplands and stream terraces. These soils are moderately permeable. A seasonal high water table is at a depth of 1 foot to 2.5 feet generally in winter to midspring. The slope is 0 to 2 percent. Ocilla soils are loamy, siliceous, thermic Aquic Arenic Paleudults.

Ocilla soils are geographically associated with Pelham and Stilson soils. Pelham soils are in smooth areas, in depressions, and in drainageways on the uplands. They are poorly drained. Stilson soils are in somewhat higher-lying, smoother areas than Ocilla soils. In addition, these soils consist of 5 percent or more plinthite at a depth of more than 45 inches. They are moderately well drained.

Typical pedon of Ocilla loamy sand, 0 to 2 percent slopes; 0.9 mile north of Colquitt-Worth County line on Georgia State Highway 256, 2.6 miles west on dirt road, 360 feet north on dirt road; on east side of the road.

A—0 to 6 inches; very dark gray (10YR 3/1) loamy sand; weak fine granular structure; very friable; common fine roots; strongly acid; abrupt wavy boundary.

E1—6 to 20 inches; light brownish gray (10YR 6/2) loamy sand; weak fine granular structure; very friable; few fine roots; root holes filled with very dark gray loamy sand; strongly acid; clear wavy boundary.

E2—20 to 32 inches; pale brown (10YR 6/3) loamy sand; common medium distinct light yellowish brown (10YR 6/4) and light gray (10YR 6/1) mottles; weak fine granular structure; very friable; few fine roots; strongly acid; gradual wavy boundary.

Bt1—32 to 38 inches; brownish yellow (10YR 6/6) sandy loam; common medium distinct light gray (10YR 7/1) and yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

Bt2—38 to 48 inches; brownish yellow (10YR 6/6) sandy clay loam; many medium distinct light gray (10YR 7/1), yellowish brown (10YR 5/6), and yellowish red (5YR 4/6) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; about I percent plinthite; very strongly acid; gradual wavy boundary.

Bt3—48 to 68 inches; mottled light yellowish brown (10YR 6/4), light gray (10YR 7/1), and yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

Bt4—68 to 80 inches; mottled light yellowish brown (10YR 6/4), light gray (10YR 7/1), and strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; very strongly acid.

The thickness of the solum is 80 inches or more. The reaction is very strongly acid or strongly acid except in areas where the surface layer has been limed.

The sandy epipedon is 30 to 40 inches thick. The Ap or A horizon is 3 to 8 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 1 to 3.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 4. This horizon has few to many gray and brown mottles.

Some pedons have a BE horizon that has hue of 10YR, value of 6, and chroma of 4. It has common gray or brown mottles. The Bt1 horizon has hue of 10YR, value of 5 or 6, and chroma of 4 or 6. This horizon has few to many light gray, yellowish brown, and yellowish red mottles. The lower part of the Bt horizon has hue of 10YR, value of 5 to 7, and chroma of 1, 2, 3, 4, or 6 and has common or many reddish, grayish, and brownish mottles; or it is mottled in shades of gray, brown, yellow, and red. The texture in the lower part of the Bt horizon mainly is sandy clay loam, but it is sandy loam in some pedons. Some pedons contain plinthite that ranges to 3 percent.

Orangeburg Series

The Orangeburg series consists of well drained soils that formed mainly in loamy marine sediment on the uplands. These soils are moderately permeable. The slope is 2 to 8 percent. Orangeburg soils are fine-loamy, siliceous, thermic Typic Paleudults.

Orangeburg soils are geographically associated with Lucy and Norfolk soils. Lucy soils have an arenic epepidon. Norfolk soils have a predominantly yellowish brown Bt horizon.

Typical pedon of Orangeburg loamy sand, 2 to 5 percent slopes; 0.1 mile north of Abrams Creek on Georgia State Highway 300, 1.5 miles east and 0.3 mile south on Egypt road; 20 feet west of the road.

Ap—0 to 8 inches; brown (7.5YR 5/4) loamy sand; weak fine granular structure; very friable; many fine roots; slightly acid; abrupt smooth boundary.

Bt1—8 to 12 inches; yellowish red (5YR 4/6) sandy loam; weak fine subangular blocky structure; friable; many fine roots; few fine pores; strongly acid; clear smooth boundary.

Bt2—12 to 72 inches; red (2.5YR 4/8) sandy clay loam; moderate medium subangular blocky structure; firm; few fine roots; many fine and very fine pores; common distinct clay films on faces of most peds; strongly acid.

The thickness of the solum is 72 inches or more. The reaction is very strongly acid or strongly acid except in areas where the surface layer has been limed. Some pedons have few or common ironstone nodules.

The A horizon is 7 to 10 inches thick. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4; or hue of 7.5YR, value of 4 or 5, and chroma of 2 or 4.

Some pedons have a E horizon of loamy sand that has hue of 7.5YR, value of 4, and chroma of 4.

The Bt1 horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. The texture is sandy loam or sandy clay loam. The Bt2 horizon has hue of 2.5YR, value of 4, and chroma of 6 or 8; or hue of 5YR, value of 4 or 5, and chroma of 6. In some pedons, few or common, brown and red mottles are in the lower part of the Bt2 horizon. The texture of the Bt2 horizon is mainly sandy clay loam; but in some pedons, it is sandy clay in the lower part of this horizon.

Pelham Series

The Pelham series consists of poorly drained soils that formed in sandy and loamy marine sediment in broad, smooth, even areas and in drainageways on the uplands. These soils are moderately permeable. A seasonal high water table is at a depth of 0.5 foot to 1.5 feet generally from midwinter to midspring. The slope is 0 to 2 percent. Pelham soils are loamy, siliceous, thermic Arenic Paleaquults.

Pelham soils are geographically associated with Albany and Ocilla soils. Albany and Ocilla soils are in higher-lying, smoother, more even areas on the uplands than Pelham soils. These soils are somewhat poorly drained. In addition, Albany soils have a grossarenic epipedon.

Typical pedon of Pelham loamy sand; 1.8 miles west of Worth-Tift County line on U.S. Highway 82, 0.5 mile north on dirt road; 150 feet east of the dirt road.

A—0 to 3 inches; very dark grayish brown (10YR 3/2) loamy sand; weak fine granular structure; very friable; common fine roots; strongly acid; abrupt smooth boundary.

E1—3 to 14 inches; grayish brown (10YR 5/2) loamy sand; weak fine granular structure; very friable; common fine roots; very strongly acid; clear wavy boundary.

E2—14 to 26 inches; gray (10YR 5/1) loamy sand; weak fine granular structure; very friable; strongly acid; clear wavy boundary.

Btg1—26 to 32 inches; light gray (10YR 6/1) sandy loam; few medium distinct pale brown (10YR 6/3) mottles; weak fine subangular blocky structure; friable; strongly acid; clear wavy boundary.

Btg2—32 to 65 inches; light gray (10YR 6/1) sandy clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable; thin patchy clay films on faces of some peds; strongly acid; gradual wavy boundary.

Btg3—65 to 80 inches; mottled light gray (10YR 6/1), yellowish brown (10YR 5/6), brownish yellow (10YR 6/6), and yellowish red (5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; thin patchy clay films on faces of some peds; strongly acid.

The thickness of the solum is 60 inches or more. The reaction is very strongly acid or strongly acid except in areas where the surface layer has been limed.

The sandy epipedon is 21 to 36 inches thick. The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2; or hue of 2.5Y, value of 4 to 6, and chroma of 2.

The Btg horizon has hue of 5Y or 10YR, value of 6 or 7, and chroma of 1. Yellowish and brownish mottles are few or common in the upper part of the Btg horizon and are common or many in the lower part. In some pedons, the lower part of the Btg horizon is mottled in shades of yellow, brown, and red. The texture of the Btg horizon is sandy clay loam or sandy loam.

Red Bay Series

The Red Bay series consists of well drained soils that formed mainly in loamy marine sediment on the uplands. These soils are moderately permeable. The slope is 2 to 5 percent. Red Bay soils are fine-loamy, siliceous, thermic Rhodic Paleudults.

Red Bay soils are geographically associated with Lucy and Orangeburg soils. The associated soils have a predominately red subsoil. In addition, Lucy soils have an arenic epipedon.

Typical pedon of Red Bay loamy sand, 2 to 5 percent slopes; 2.9 miles north of Dougherty-Worth County line on Georgia State Highway 300, 1.6 miles west of State Highway 300 on field road, 0.3 mile north on field road; 60 feet east of the field road.

Ap—0 to 8 inches; dark reddish brown (5YR 3/3) loamy sand; weak fine granular structure; very friable; many fine and very fine roots; strongly acid; clear smooth boundary.

Bt1—8 to 17 inches; dark reddish brown (2.5YR 3/4) sandy loam; weak fine subangular blocky structure; friable; common fine and very fine roots; mixing of Ap horizon in root holes; strongly acid; clear smooth boundary.

Bt2—17 to 25 inches; dark red (2.5YR 3/6) sandy clay loam; weak fine subangular blocky structure; friable; few very fine roots; mixing of Bt1 horizon in root holes; few patchy clay films on faces of most peds; very strongly acid; gradual smooth boundary.

Bt3—25 to 96 inches; dark red (2.5YR 3/6) sandy clay loam; weak medium subangular blocky structure; friable; most peds bridged with clay; very strongly acid.

The thickness of the solum is 60 inches or more. The reaction is strongly acid or very strongly acid except in areas where the surface layer has been limed.

The A horizon is 7 to 10 inches thick. It has hue of 5YR, value of 3, and chroma of 2 or 3.

Some pedons have a BE horizon that has hue of 2.5YR, value of 3, and chroma of 4 or 6. The Bt horizon has hue of 2.5YR, value of 3, and chroma of 4 or 6. The texture is sandy clay loam, but the upper few inches ranges to sandy loam.

Stilson Series

The Stilson series consists of moderately well drained soils that formed in sandy and loamy marine sediment on the uplands. These soils are moderately permeable. A seasonal high water table is at a depth of 2.5 to 3 feet generally from late in the fall to midspring. The slope is 0 to 2 percent. Stilson soils are loamy, siliceous, thermic Arenic Plinthic Paleudults.

Stilson soils are geographically associated with Dothan, Fuquay, Leefield, and Pelham soils. Dothan and Fuquay soils are well drained. They are on ridgetops. In addition, Dothan soils have a sandy epipedon less than 20 inches thick. Leefield soils are somewhat poorly drained. They are in slightly lower-lying, smoother areas than Stilson soils. Pelham soils are poorly drained. They are in smoother, more even areas than Stilson soils and are in depressions and near drainageways on the uplands.

Typical pedon of Stilson loamy sand, 0 to 2 percent slopes; 2.75 miles east of Oakfield on dirt road; 0.4 mile south on the field road.

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

E—8 to 25 inches; light yellowish brown (10YR 6/4) loamy sand; weak fine granular structure; very friable; common fine roots; strongly acid; clear wavy boundary.

Bt1—25 to 30 inches; light yellowish brown (10YR 6/4) sandy loam; weak fine subangular blocky structure; very friable; very strongly acid; clear wavy boundary.

Bt2—30 to 39 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium distinct yellowish brown (10YR 5/6) mottles and light brownish gray (10YR 6/2) mottles in the lower part; weak medium subangular blocky structure; friable; few fine pores; few faint clay films on faces of peds; few ironstone nodules; very strongly acid; gradual wavy boundary.

Bt3—39 to 45 inches; brownish yellow (10YR 6/8) sandy clay loam; common medium distinct light gray (10YR 7/1) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few fine pores; about 2 percent plinthite; common distinct clay films on faces of peds; few rounded ironstone nodules; very strongly acid; gradual wavy boundary.

Btv1—45 to 64 inches; brownish yellow (10YR 6/6) sandy clay loam; many coarse distinct light gray (10YR 7/1), yellowish red (5YR 4/6), and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine pores; about 8 percent plinthite nodules in lower part; common distinct clay films on faces of peds; few rounded ironstone nodules; very strongly acid; gradual wavy boundary.

Btv2—64 to 80 inches; brownish yellow (10YR 6/6) sandy clay loam; many coarse distinct light gray (10YR 7/1), yellowish red (5YR 4/6), and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; firm; 2 percent plinthite in upper part; few faint clay films; very strongly acid.

The thickness of the solum is 60 inches or more. The reaction is very strongly acid or strongly acid except in areas where the surface layer has been limed. Depth to the horizon containing 5 percent or more plinthite is 38 to 60 inches. Plinthite ranges from 5 to 15 percent to a depth of 60 inches or more. Some pedons have a few rounded ironstone nodules in the upper and middle horizons.

The sandy epipedon is 22 to 30 inches thick. The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 4.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 4 or 6. Few or common, grayish and brownish mottles are at a depth of 30 to 40 inches. The Btv horizon has distinct or prominent grayish, reddish, and brownish mottles. The texture of the Bt and Btv horizons commonly is sandy clay loam, but in some pedons, the texture is sandy loam.

Susquehanna Series

The Susquehanna series consists of somewhat poorly drained soils that formed in clayey marine sediment on the uplands. These soils are very slowly permeable. A seasonal high water table commonly is at a depth of more than 6 feet. These soils are wet during periods of frequent rainfall, but they do not have a free water table. The slope is 2 to 12 percent. Susquehanna soils are fine, montmorillonitic, thermic Vertic Paleudalfs.

Susquehanna soils are geographically associated with Carnegie, Cowarts, and Esto soils. The associated soils are well drained. In addition, Carnegie soils have a subsoil that is 5 percent or more plinthite at a depth of more than 19 inches, and Cowarts soils are in a fine-loamy family.

Typical pedon of Susquehanna loamy sand, from an area of Esto-Susquehanna loamy sands, 2 to 5 percent slopes; 3.6 miles west of city limits of Sylvester on U.S. Highway 82, 300 feet north on county road, 300 feet east on county road; 30 feet north of the road.

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

Bt1—4 to 10 inches; reddish brown (5YR 4/4) clay; few fine distinct red (2.5YR 4/8) mottles; strong medium subangular blocky structure; very firm, very plastic; common fine and medium roots; common distinct clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt2—10 to 32 inches; light brownish gray (10YR 6/2) clay; common medium prominent red (2.5YR 4/8) mottles and common medium distinct yellowish brown (10YR 5/6) mottles; strong medium angular blocky structure; very firm, very plastic; few medium roots; many prominent clay films on faces of peds; few slickensides; very strongly acid; gradual smooth boundary.

Bt3—32 to 55 inches; gray (5Y 6/1) clay; common medium distinct olive yellow (2.5Y 6/6) mottles and common medium prominent strong brown (7.5YR 5/8) mottles; strong medium angular blocky structure; very firm, very plastic, very sticky; few medium roots; many prominent clay films on faces of peds; few slickensides; very strongly acid; gradual smooth boundary.

Bt4—55 to 62 inches; light olive gray (5Y 6/2) clay; common medium distinct yellow (5Y 7/6) mottles; strong medium angular blocky structure; very firm, very plastic, very sticky; few medium roots; many prominent clay films on faces of peds; very strongly acid.

The thickness of the solum is 61 inches or more. The reaction is very strongly acid or strongly acid except in areas where the surface layer has been limed.

The A horizon is 3 to 6 inches thick. It has hue of 7.5YR or 10YR, value of 4, and chroma of 2.

Some pedons have an E horizon that has hue of 10YR, value of 5 or 6, and chroma of 3. Few rounded ironstone nodules are in some pedons.

The upper part of the Bt horizon has hue of 10YR, 7.5YR, or 5YR, value of 5, and chroma of 4, 6, or 8; or it has hue of 10YR, 7.5YR, or 5YR, value of 4, and chroma of 4 or 6. It has few or common mottles of gray or in shades of red or brown. The lower part of the Bt horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2; hue of 7.5YR, value of 6 or 7, and chroma of 2; or hue of 5Y, value of 6, and chroma of 1 or 2; or it is neutral and has value of 5 to 7. This part of the Bt horizon has few to many reddish and brownish mottles. In some pedons, the lower part of the Bt horizon is mottled in shades of red, brown, and gray and has no dominant matrix color. The texture of the Bt horizon is clay or silty clay.

Tifton Series

The Tifton series consists of well drained soils that formed mainly in loamy marine sediment on the uplands. These soils are moderately permeable. The slope is 0 to 8 percent. Tifton soils are fine-loamy, siliceous, thermic Plinthic Paleudults.

Tifton soils are geographically associated with Carnegie, Clarendon, and Dothan soils. Carnegie soils are in a clayey family and have 5 percent or more plinthite at a depth of 18 to 22 inches. Clarendon and Dothan soils contain less than 5 percent ironstone nodules. In addition, Clarendon soils are moderately well drained.

Typical pedon of Tifton loamy sand, 2 to 5 percent slopes; 1.5 miles east of Georgia State Highway 133 on Bridgeboro Road, 0.7 mile northwest on Parkerville-Doerun Road; 100 feet west of the road.

Apc—0 to 10 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable; many fine roots; 8 percent ironstone nodules, 0.12 to 0.50 inch in diameter; strongly acid; abrupt smooth boundary.

Btc1—10 to 16 inches; yellowish brown (10YR 5/6) sandy loam; weak fine subangular blocky structure; friable; common fine roots; 6 percent ironstone nodules; strongly acid; clear smooth boundary.

Btc2—16 to 25 inches; yellowish brown (10YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; common fine roots; few faint clay films on faces of peds; 5 percent ironstone nodules; strongly acid; gradual wavy boundary.

Btc3—25 to 42 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; firm; 2 percent plinthite in lower part; common distinct clay films on faces of peds; 5 percent small ironstone nodules; very strongly acid; gradual wavy boundary.

Btv1—42 to 56 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium prominent red (2.5YR 4/8) and strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm; about 10 percent plinthite; common distinct clay films on faces of peds; 2 percent small ironstone nodules; very strongly acid; gradual wavy boundary.

Btv2—56 to 80 inches; reticulately mottled yellowish brown (10YR 5/8), red (2.5YR 5/8), light gray (10YR 7/2), yellowish red (5YR 4/6), and strong brown (7.5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; firm; about 15 percent plinthite; few faint clay films on faces of peds; very strongly acid.

The thickness of the solum is 60 inches or more. The reaction is very strongly acid or strongly acid except in areas where the surface layer has been limed. Depth to horizons containing 5 percent or more plinthite is 32 to 50 inches. Plinthite ranges from 8 to 15 percent to a depth of 60 inches or more.

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

Some pedons have an E horizon that has hue of 10YR, value of 5 or 6, and chroma of 4. The volume of ironstone nodules is 8 to 15 percent of the A and E horizons.

The Btc horizons and the Btv1 horizon have hue of 10YR or 7.5YR, value of 5, and chroma of 4, 6, or 8. The Btv1 horizon has few or common red mottles. The Btv2 horizon is reticulately mottled in shades of red, brown, gray, or yellow; or it has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4, 6, or 8. Ironstone nodules are 5 to 15 percent in the Bt and Btc horizons; and are 0 to 8 percent in the Btv horizons. The texture of the upper few inches of the Bt horizon is sandy loam or sandy clay loam. The texture of the remainder of the Bt horizon is mainly sandy clay loam but ranges to sandy clay in the lower part of the horizon.

Wagram Series

The Wagram series consists of well drained soils that formed in sandy and loamy marine sediment on the uplands. These soils are moderately permeable. The slope is 0 to 5 percent. Wagram soils are loamy, siliceous, thermic Arenic Paleudults.

Wagram soils are geographically associated with Lucy, Norfolk, and Orangeburg soils. Lucy soils have a red Bt horizon. Norfolk and Orangeburg soils have a sandy epipedon less than 20 inches thick. In addition, Orangeburg soils have a red Bt horizon.

Typical pedon of Wagram loamy sand, 0 to 5 percent slopes; 1.3 miles south of Georgia State Highway 32 on Georgia State Highway 300; 200 feet east of Georgia State Highway 300.

Ap—0 to 8 inches; brown (10YR 5/3) loamy sand; weak fine granular structure; very friable; common fine and medium roots; slightly acid; clear smooth boundary.

E1—8 to 16 inches; light yellowish brown (10YR 6/4) loamy sand; weak fine granular structure; very friable; common fine and medium roots; strongly acid; gradual wavy boundary.

E2—16 to 30 inches; light yellowish brown (10YR 6/4) loamy sand; weak fine granular structure; very friable; few fine and medium roots; strongly acid; gradual wavy boundary.

Bt1—30 to 38 inches; brownish yellow (10YR 6/6) sandy loam; weak fine subangular blocky structure; friable; few fine roots; very strongly acid; clear wavy boundary.

Bt2—38 to 64 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; few distinct patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—64 to 96 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium distinct strong brown (7.5YR 5/6) and red (2.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; 2 percent plinthite; common distinct patchy clay films on faces of peds; very strongly acid.

The thickness of the solum is 60 to 80 inches or more. The reaction is very strongly acid or strongly acid except in areas where the surface layer has been limed.

The sandy epipedon is 21 to 30 inches thick. The A horizon is 3 to 10 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 4.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 4, 6, or 8. In some pedons are mottles in shades of red, brown, and yellow at a depth of more than 50 inches. In some pedons are gray mottles commonly at a depth of 60 inches or more. The texture of the Bt horizon is sandy clay loam or sandy loam.

Wahee Series

The Wahee series consists of somewhat poorly drained soils that formed in loamy and clayey sediment on low-lying stream terraces near the larger streams. These soils are slowly permeable. A seasonal high water table is at a depth of 0.5 foot to 1.5 feet from early in the winter to early in the spring. The slope is 0 to 2 percent. Wahee soils are clayey, mixed, thermic Aeric Ochraquults.

Wahee soils are geographically associated with Ocilla and Pelham soils. The associated soils have an arenic epipedon. In addition, Pelham soils are poorly drained. They are in broad, smooth, even areas and in depressions and drainageways.

Typical pedon of Wahee fine sandy loam, 0 to 2 percent slopes, frequently flooded; 0.3 mile south on paved road that is the Dougherty Worth county line road from junction of U.S. Highway 82; 50 feet east of the road.

A—0 to 4 inches; very dark gray (10YR 3/1) fine sandy loam; weak fine granular structure; friable; many fine and medium roots; strongly acid; clear smooth boundary.

E—4 to 12 inches; grayish brown (2.5Y 5/2) fine sandy loam; moderate fine granular structure; friable; many fine and medium roots; strongly acid; clear smooth boundary.

Bt1—12 to 15 inches; light yellowish brown (2.5Y 6/4) sandy clay loam that has pockets of sandy loam; few medium distinct brownish yellow (10YR 6/8) and gray (10YR 6/1) mottles; weak medium subangular blocky structure; friable; very strongly acid; abrupt wavy boundary.

Bt2—15 to 20 inches; pale olive (5Y 6/3) clay; common medium distinct gray (10YR 6/1) mottles and common medium prominent yellowish brown (10YR 5/8) and yellowish red (5YR 4/8) mottles; moderate medium subangular blocky structure; firm; few fine pores; patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg1—20 to 35 inches; gray (5Y 6/1) clay; common medium distinct yellowish brown (10YR 5/8) mottles and few common prominent yellowish red (5YR 5/6) mottles; moderate medium subangular blocky structure; firm; patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg2—35 to 50 inches; gray (5Y 6/1) clay; moderate medium distinct yellowish brown (10YR 5/8) mottles and common medium prominent yellowish red (5YR 5/6) mottles; moderate medium subangular blocky structure; firm; patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

BCg—50 to 65 inches; light gray (10YR 7/2) sandy clay loam; common medium distinct brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; friable; few fine pores; very strongly acid.

The thickness of the solum is 65 inches or more. The reaction is very strongly acid or strongly acid except in areas where the surface layer has been limed.

The A horizon is 3 to 7 inches thick. The Ap or A horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2.

In some pedons, the E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 or 3.

The Bt1 horizon has hue of 10YR, value of 5, and chroma of 3 or 4 and has few or common gray mottles. The Btg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Some pedons have common or many mottles that are in shades of yellow, gray, brown, and red. The texture of the Bt horizon commonly is sandy clay but ranges to clay loam or sandy clay loam in the upper part. In some pedons, the BCg horizon has grayish, brownish, yellowish, and reddish mottles; or it has hue of 10YR or 5Y, value of 7, and chroma of 1 and has yellowish, brownish, or reddish mottles.

Some pedons have a Cg horizon that has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. The texture is sandy loam or loamy sand.

Formation of the Soils

In this section, the factors of soil formation are discussed and related to the soils in Worth County.

Factors of Soil Formation

Soil characteristics are determined by the physical and mineral composition of the parent material; the plant and animal life on and in the soil; the relief, or lay of the land; the climate under which the parent material accumulated and has existed since accumulation; and the length of time that the forces of soil formation have acted on the soil material *(6)*. All of these factors influence every soil, but the significance of each factor varies from place to place. In one area, one factor may dominate soil formation; in another area, a different factor may be the most important.

The interrelationships among these five factors are complex, and the effects of any one factor cannot be isolated and completely evaluated. It is convenient, however, to discuss each factor separately and to indicate the probable effects of each.

Parent Material

Parent material is the unconsolidated mass in which soil forms. It is largely responsible for the chemical and mineralogical composition of the soil. Worth County is underlain by Coastal Plain sedimentary rock *(9)*. Sandy and loamy marine sediment generally is underlain by the sedimentary rock.

The Ocala Limestone Formation makes up the parent material for the soils on the uplands in the extreme northwestern part of the county. The main soils that formed in these areas are Lakeland, Fuquay, Tifton, and Wagram soils. These soils are nearly level to gently sloping and have smooth and convex slopes. They have a brownish, sandy surface layer or subsurface layer, or both, and a brownish, loamy subsoil that generally is mottled in the middle and lower parts, or they are brownish and sandy throughout. Soils of minor extent that formed from this parent material are Orangeburg and Stilson soils. Orangeburg soils predominantly are red and loamy. They are in similar postions on the landscape as Lakeland, Fuquay, Tifton, and Wagram soils. Stilson soils are nearly level and are in smooth areas. They have a brownish, sandy surface and subsurface layer and a predominantly brownish, loamy subsoil that is mottled.

The Suwannee Limestone Formation and its residuum make up the parent material for the soils on the uplands in the remainder of the northwestern part of the county. The main soils that formed in these areas are Tifton and Pelham soils. Tifton soils are nearly level to gently sloping and have smooth and convex slopes. These soils are on ridgetops and hillsides on the uplands. They have a brownish, sandy surface layer and a brownish, loamy subsoil that is mottled in the lower part. Pelham soils are mainly in drainageways on the uplands. They are mainly grayish throughout and have a sandy surface layer and subsurface layer and a loamy subsoil. Soils of minor extent that formed from this parent material are Fuquay and Stilson soils. Fuquay soils are in similar positions on the landscape as Tifton soils. They have a brownish, sandy surface layer and subsurface layer and a brownish, loamy subsoil that is mottled in the middle and lower parts. Stilson soils are nearly level and are in smooth areas. They have a brownish, sandy surface layer and subsurface layer and a brownish, loamy subsoil that is mottled.

The Neogene Undifferentiated Formation makes up the parent material for the soils on the uplands in the middle part of the county. The main soils that formed in these areas are Cowarts, Esto, Tifton, and Pelham soils. Cowarts, Esto, and Tifton soils are nearly level to strongly sloping and have smooth and convex slopes. In places, the slopes are short and complex. They have a brownish, sandy surface layer and a brownish, loamy or clayey subsoil that generally is mottled in the middle or lower parts, or in both parts. In places, the subsoil is extremely firm and compact. Pelham soils are nearly level and are mainly in drainageways on the uplands. They are mainly grayish throughout and have a sandy surface layer and subsurface layer and a loamy subsoil. Soils of minor extent that formed from this parent material are the Fuquay and Susquehanna soils. These soils are in similar positions on the landscape as Cowarts, Esto, Tifton, and Pelham soils. Fuquay soils have a brownish, sandy surface layer and subsurface layer and a brownish, loamy subsoil that is mottled in the middle and lower parts. Susquehanna soils have a brownish, sandy surface layer and a predominantly grayish, clayey subsoil that is mottled and very plastic.

The Miccosukee Formation makes up the parent material for the soils on the uplands in the southeastern part of the county. The main soils that formed in these areas are Cowarts, Fuquay, Tifton, and Pelham soils. Cowarts, Fuquay, and Tifton soils are nearly level to gently sloping and have smooth and convex slopes. In places, the slopes are short and complex. They have a brownish, sandy surface layer or subsurface layer, or both, and a brownish, loamy subsoil that is mottled in the middle or lower parts, or in both parts. In places, the subsoil is extremely firm and compact. Pelham soils are nearly level and are mainly in drainageways on the uplands. They are mainly grayish throughout and have a sandy surface layer and subsurface layer and a loamy subsoil.

Stream alluvium is adjacent to all the streams in Worth County. The soils in this alluvium formed in more recent sediment than that in which the soils on the uplands formed. Herod soils are the main soils that formed on the flood plains near Abrams and Mill Creeks. These soils have predominantly neutral reaction. They are nearly level and loamy throughout. They have a brownish surface layer, and below the surface layer, they have a grayish color. Kinston soils are the main soils that formed on the flood plains near Little Ochlockonee River, Horse Creek, Little Creek, Ty Ty Creek, and Warrior Creek. Kinston soils are strongly acid or very strongly acid. They are nearly level and loamy throughout. These soils have a brownish surface layer, and below the surface layer, thay have a grayish color.

Plants and Animals

The role of plants, animals, and other organisms is significant in soil development. Plants and animals increase the amount of organic matter and of nitrogen in the soil, increase or decrease the content of plant nutrients, and change soil structure and porosity.

Plants recycle nutrients, accumulate organic matter, and provide food and cover for animals. Plants stabilize the surface layer so that soil-forming processes can continue. Vegetation also provides a more stable environment for soil-forming processes by protecting the soils from extremes in temperature.

The soils in Worth County formed under a succession of briers, brambles, and woody plants that yielded to pines and hardwood trees. Later, the hardwoods suppressed most other plants and became the climax vegetation.

Animals rearrange soil material by roughening the surface, forming and filling channels, and shaping the peds and voids. The soil is mixed by ants, wasps, worms, and spiders that make channels; by crustacea, such as crabs and crayfish; and by turtles and foxes that dig burrows. Humans affect the soil-forming process by tilling the crops, removing natural vegetation and establishing different plants, and reducing or increasing fertility.

Bacteria, fungi, and other micro-organisms hasten decomposition of organic matter and increase the release of minerals for plant growth.

The net gains and losses caused by plants and animals in the soil-forming process are important in Worth County. However, the relationship between plants and animals, climate, and parent material is very close; therefore, the soils do not differ significantly because of the role of plants and animals.

Climate

The present climate of Worth County is thought to be similar to the climate that existed as the soils formed. The relatively high rainfall and warm temperature contribute to rapid soil formation and are the two most important climatic features that relate to soil properties.

Water from precipitation is essential in the formation of soil. Water dissolves soluble materials and is used by plants and animals. It transports material from one part of the soil to another part or from one area to another area.

Soils in Worth County formed under a thermic temperature regime; that is, the mean soil temperature at a depth of 20 inches is 59 to 72 degrees Fahrenheit. Based on the mean annual air temperature, it is estimated the soil temperature in Worth County is about 69 degrees F. The rate of chemical reactions and other processes in the soil depends to some extent on temperature. In addition, temperature affects the type and quantity of vegetation, the amount and kind of organic matter, and the rate of decomposition of organic matter.

Relief

Relief is the elevations or inequalities of the land surface considered collectively. Color of the soil, wetness, thickness of the A horizon, content of organic matter, and plant cover are commonly related to relief. In Worth County, the obvious effects of relief are color of the soil and wetness.

Dothan and Tifton soils mainly have a yellowish brown subsoil. Coxville and Pelham soils are primarily gray throughout the subsoil. This color difference results from a difference in relief and a corresponding difference in internal drainage. Dothan and Tifton soils are in higher positions on the landscape and are better drained than the other soils; therefore, the soil material is better oxidized, and the subsoil is more brown.

The movement of water across the surface and through the soil is controlled mostly by relief. Water flowing over the soil generally carries solid particles and causes erosion or deposition, depending on the kind of relief. More water runs off sloping areas; therefore, the soils are drier because less water enters the soil. Soils in the lower-lying areas are generally more wet because they receive the water that flows off and through the soils that are in higher positions on the landscape.

Time

The length of time that soil-forming factors act on the parent material determines the characteristics of the soil. Determinations of when soil formation began in the county are not exact, but most soils in Worth County are considered mature. Mature soils are in equilibrium with the environment. They have readily recognizable pedogenic horizons and show a regular decrease in content of carbon with an increase in depth. Some areas of Dothan and Tifton soils are on broad, stable landscapes where the soil-forming processes have been active for thousands of years. These mature soils have a thick solum and a well expressed zone of illuviation.

Kinston soils receive sediment annually from floodwaters. These young soils are stratified and are not old enough to have a zone of illuviation. The young soils do not have pedogenic horizons. They show an irregular decrease in content of carbon with an increase in depth.

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Glossary

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels, i.e., clay coating, clay skin.

Climax vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

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

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

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

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

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons.

Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic)—Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated)—Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, such as fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay are in the soil. The soil is not a source of gravel or sand for construction purposes.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is, in part, a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as accumulation of clay, sesquioxides, humus, or a combination of these; prismatic or blocky structure; redder or browner colors than those in the A horizon; or a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Arabic numeral 2 precedes the letter C.

R layer.—Consolidated rock (unweathered bedrock) beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (cr trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water to move through the profile. Permeability is measured as the number of inches per hour that water moves through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Subsurface tunnels or pipelike cavities are formed by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of the acidity or alkalinity of a soil expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Seepage (in tables). The movement of water through the soil adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Small stones (in tables). Rock fragments less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

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

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Terrace. An embankment, or ridge, constructed on the contour or at a slight angle to the contour across sloping soils. The terrace intercepts surface runoff, so that water soaks into the soil or flows slowly to a prepared outlet.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced by atmospheric agents in rocks or other deposits at or near the earth's surface. These changes result in disintegration and decomposition of the material.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Data recorded in the period 1951-81 at Moultrie, Georgia]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	62.2	38.9	50.6	80	16	177	4.13	2.00	5.97	7	0.0
February---	65.2	40.9	53.1	83	21	178	4.62	2.30	6.63	7	0.1
March------	72.3	47.4	59.9	87	26	322	4.79	2.39	6.86	7	0.0
April------	80.0	54.3	67.2	91	38	516	3.92	1.46	5.97	6	0.0
May--------	86.0	61.2	73.6	96	46	732	4.49	2.03	6.60	7	0.0
June-------	90.4	66.9	78.7	99	55	861	4.84	1.94	7.29	8	0.0
July-------	92.0	69.4	80.7	100	61	952	5.70	3.28	7.84	10	0.0
August-----	91.5	68.9	80.2	98	61	936	4.72	2.91	6.34	8	0.0
September--	87.7	65.5	76.6	96	52	798	4.09	1.45	6.27	6	0.0
October----	79.9	54.8	67.4	92	33	539	2.30	0.47	3.73	4	0.0
November---	71.0	45.5	58.3	86	23	258	2.46	0.86	3.78	4	0.0
December---	64.2	39.9	52.1	81	19	151	4.09	1.98	5.91	6	0.0
Yearly:											
Average--	78.5	54.5	66.5	---	---	---	---	---	---	---	---
Extreme--	---	---	---	101	15	---	---	---	---	---	---
Total----	---	---	---	---	---	6,420	50.15	40.77	59.10	80	0.1

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 °F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Data recorded in the period 1951-81 at Moultrie, Georgia]

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 9	March 21	March 28
2 years in 10 later than--	February 25	March 11	March 21
5 years in 10 later than--	February 2	February 20	March 7
First freezing temperature in fall:			
1 year in 10 earlier than--	November 15	November 9	October 29
2 years in 10 earlier than--	November 24	November 15	November 3
5 years in 10 earlier than--	December 11	November 26	November 13

TABLE 3.--GROWING SEASON

[Data recorded in the period 1951-81 at Moultrie, Georgia]

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	281	242	226
8 years in 10	292	254	234
5 years in 10	313	278	251
2 years in 10	341	302	267
1 year in 10	>365	315	276

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
AoA	Albany sand, 0 to 2 percent slopes	450	0.1
CaC	Carnegie sandy loam, 5 to 8 percent slopes	14,950	4.0
CaD	Carnegie sandy loam, 8 to 12 percent slopes	370	0.1
CbB	Carnegie gravelly sandy loam, 3 to 5 percent slopes	7,580	2.0
CdA	Clarendon loamy sand, 0 to 2 percent slopes	4,825	1.3
CoB	Cowarts loamy sand, 2 to 5 percent slopes	6,605	1.8
CoC	Cowarts loamy sand, 5 to 8 percent slopes	8,355	2.3
CoD	Cowarts loamy sand, 8 to 12 percent slopes	320	0.1
Cx	Coxville fine sandy loam	9,755	2.6
DoA	Dothan loamy sand, 0 to 2 percent slopes	2,235	0.6
DoB	Dothan loamy sand, 2 to 5 percent slopes	11,740	3.2
EoB	Esto loamy sand, 2 to 5 percent slopes	1,455	0.4
EoC	Esto loamy sand, 5 to 8 percent slopes	745	0.2
EoD	Esto loamy sand, 8 to 12 percent slopes	350	0.1
EsB	Esto-Susquehanna loamy sands, 2 to 5 percent slopes	7,215	1.9
EsD	Esto-Susquehanna loamy sands, 5 to 12 percent slopes	9,125	2.5
FrB	Freemanville sandy loam, 2 to 5 percent slopes	2,605	0.7
FsB	Fuquay loamy sand, 0 to 5 percent slopes	27,070	7.3
FsC	Fuquay loamy sand, 5 to 8 percent slopes	1,175	0.3
He	Herod sandy loam, frequently flooded	3,520	1.0
HrA	Hornsville fine sandy loam, 0 to 2 percent slopes	1,390	0.4
Ko	Kinston fine sandy loam, frequently flooded	16,590	4.5
LaB	Lakeland sand, 0 to 5 percent slopes	7,155	1.9
LeA	Leefield loamy sand, 0 to 2 percent slopes	11,665	3.1
LmB	Lucy loamy sand, 0 to 5 percent slopes	1,910	0.5
LmC	Lucy loamy sand, 5 to 8 percent slopes	290	0.1
NoA	Norfolk loamy sand, 0 to 2 percent slopes	760	0.2
NoB	Norfolk loamy sand, 2 to 5 percent slopes	1,090	0.3
OcA	Ocilla loamy sand, 0 to 2 percent slopes	5,005	1.4
OrB	Orangeburg loamy sand, 2 to 5 percent slopes	3,200	0.9
OrC	Orangeburg loamy sand, 5 to 8 percent slopes	1,000	0.3
Pe	Pelham loamy sand	15,240	4.1
Po	Pelham loamy sand, occasionally flooded	51,835	14.0
ReB	Red Bay loamy sand, 2 to 5 percent slopes	430	0.1
SeA	Stilson loamy sand, 0 to 2 percent slopes	11,690	3.2
TfA	Tifton loamy sand, 0 to 2 percent slopes	6,380	1.7
TfB	Tifton loamy sand, 2 to 5 percent slopes	99,370	26.8
TfC	Tifton loamy sand, 5 to 8 percent slopes	8,665	2.3
WaB	Wagram loamy sand, 0 to 5 percent slopes	4,480	1.2
WeA	Wahee fine sandy loam, 0 to 2 percent slopes, frequently flooded	1,970	0.5
	Total	370,560	100.0

TABLE 5.--IMPORTANT FARMLAND

Map symbol and soil name	Prime farmland acreage*	Additional farmland acreage* of statewide importance
AoA------------------ Albany	---	450
CaC------------------ Carnegie	14,950	---
CbB------------------ Carnegie	7,580	---
CdA------------------ Clarendon	4,825	---
CoB------------------ Cowarts	6,605	---
CoC------------------ Cowarts	8,355	---
DoA------------------ Dothan	2,235	---
DoB------------------ Dothan	11,740	---
EoB------------------ Esto	1,455	---
EoC------------------ Esto	---	745
EsB------------------ Esto-Susquehanna	---	7,215
FrB------------------ Freemanville	2,605	---
FsB------------------ Fuquay	---	27,070
FsC------------------ Fuquay	---	1,175
HrA------------------ Hornsville	1,390	---
LeA------------------ Leefield	---	11,665
LmB------------------ Lucy	---	1,910
LmC------------------ Lucy	---	290
NoA------------------ Norfolk	760	---
NoB------------------ Norfolk	1,090	---

See footnote at end of table.

TABLE 5.--IMPORTANT FARMLAND--Continued

Map symbol and soil name	Prime farmland acreage*	Additional farmland acreage* of statewide importance
OcA: Ocilla	---	5,005
OrB: Orangeburg	3,200	---
OrC: Orangeburg	1,000	---
ReB: Red Bay	430	---
SeA: Stilson	---	11,690
TfA: Tifton	6,380	---
TfB: Tifton	99,370	---
TfC: Tifton	8,665	---
WaB: Wagram	---	4,480
Total	182,635	71,695

* Acreage is according to date fieldwork was completed. Soils not listed do not qualify as prime farmland or as additional land of statewide importance.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

[Yields in the N columns are for nonirrigated soils; those in the I columns are for irrigated soils. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Land capability	Corn		Soybeans		Wheat		Peanuts		Improved bermudagrass		Bahiagrass
	N	N	I	N	I	N	I	N	I	N	I	N
		Bu	Bu	Bu	Bu	Bu	Bu	Lbs	Lbs	AUM*	AUM*	AUM*
AoA------------- Albany	IIIw	65	105	25	30	26	31	1,700	2,300	7.0	8.0	6.5
CaC------------- Carnegie	IIIe	65	105	30	36	32	38	3,200	4,300	6.5	8.0	7.0
CaD------------- Carnegie	IVe	---	---	---	---	---	---	---	---	6.0	7.0	6.5
CbB------------- Carnegie	IIe	75	120	35	42	37	44	3,200	4,300	9.0	12.0	7.5
CdA------------- Clarendon	IIw	125	200	45	54	50	61	---	---	10.5	13.0	10.0
CoB------------- Cowarts	IIe	80	130	35	42	37	44	2,400	3,300	8.0	10.0	7.5
CoC------------- Cowarts	IIIe	70	110	25	30	26	31	1,800	2,400	7.5	9.0	7.0
CoD------------- Cowarts	IVe	---	---	---	---	---	---	---	---	7.0	8.5	7.0
Cx-------------- Coxville	Vw	---	---	---	---	---	---	---	---	---	---	---
DoA------------- Dothan	I	120	190	40	48	44	53	3,800	5,100	10.5	14.0	9.0
DoB------------- Dothan	IIe	120	190	35	42	37	44	3,600	4,800	10.5	14.0	9.0
EoB------------- Esto	IIIe	50	80	35	42	37	44	1,700	2,050	6.0	7.5	6.0
EoC------------- Esto	IVe	40	65	30	36	32	38	1,500	1,800	5.8	7.0	5.8
EoD------------- Esto	VIe	---	---	---	---	---	---	---	---	5.5	6.5	5.5
EsB------------- Esto-Susquehanna	IVe	---	---	---	---	---	---	---	---	6.5	7.5	6.2
EsD------------- Esto-Susquehanna	VIe	---	---	---	---	---	---	---	---	6.0	7.0	5.5
FrB------------- Freemanville	IIe	85	135	35	42	37	44	3,200	4,300	10.5	14.0	8.5

See footnote at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Corn		Soybeans		Wheat		Peanuts		Improved bermudagrass		Bahiagrass
	N	N	I	N	I	N	I	N	I	N	I	N
		Bu	Bu	Bu	Bu	Bu	Bu	Lbs	Lbs	AUM*	AUM*	AUM*
FsB------------- Fuquay	IIs	80	180	30	50	32	50	2,900	4,350	7.5	10.0	8.5
FsC------------- Fuquay	IIIs	75	170	25	45	26	45	2,600	3,500	7.5	10.5	8.5
He-------------- Herod	Vw	---	---	---	---	---	---	---	---	---	---	10.0
HrA------------- Hornsville	IIw	100	160	40	48	44	53	---	---	12.0	15.0	9.0
Ko-------------- Kinston	VIw	---	---	---	---	---	---	---	---	---	---	---
LaB------------- Lakeland	IVs	55	160	20	40	21	40	2,000	3,500	7.0	9.5	7.0
LeA------------- Leefield	IIw	85	170	45	54	50	60	---	---	8.7	11.0	8.0
LmB------------- Lucy	IIs	80	180	33	50	35	42	3,000	4,050	8.0	10.5	8.5
LmC------------- Lucy	IIIs	70	160	25	45	26	45	2,500	3,750	7.5	10.0	8.5
NoA------------- Norfolk	I	120	190	45	54	50	60	4,000	5,400	10.5	14.0	8.5
NoB------------- Norfolk	IIe	120	190	45	54	50	60	4,000	5,400	10.5	14.0	8.5
OcA------------- Ocilla	IIIw	75	120	35	42	37	44	---	---	8.5	10.5	7.5
OrB------------- Orangeburg	IIe	120	190	45	54	50	60	4,000	5,400	10.5	14.0	8.5
OrC------------- Orangeburg	IIIe	95	150	35	42	37	44	3,200	4,300	10.0	12.5	8.0
Pe, Po---------- Pelham	Vw	---	---	---	---	---	---	---	---	---	---	---
ReB------------- Red Bay	IIe	120	190	45	54	50	60	4,000	5,400	10.5	14.0	8.5
SeA------------- Stilson	IIw	80	160	35	45	37	47	---	---	10.0	12.5	7.5
TfA------------- Tifton	I	115	185	46	55	51	61	3,800	5,100	10.5	14.0	8.5
TfB------------- Tifton	IIe	115	185	46	55	51	61	3,800	5,100	10.5	14.0	8.5

See footnote at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Corn		Soybeans		Wheat		Peanuts		Improved bermudagrass		Bahiagrass
	N	N	I	N	I	N	I	N	I	N	I	N
		Bu	Bu	Bu	Bu	Bu	Bu	Lbs	Lbs	AUM*	AUM*	AUM*
TfC------------- Tifton	IIIe	90	145	38	45	40	48	3,600	4,850	10.0	13.0	8.0
WaB------------- Wagram	IIs	80	180	33	50	35	50	3,000	4,050	8.0	10.5	8.5
WeA------------- Wahee	IVw	---	---	---	---	---	---	---	---	9.0	11.0	8.0

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 7.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	9,375	---	---	---
II	195,650	132,620	29,570	33,460
III	41,345	34,425	5,455	1,465
IV	27,530	8,650	11,725	7,155
V	70,595	---	70,595	---
VI	26,065	9,475	16,590	---
VII	---	---	---	---
VIII	---	---	---	---

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
AoA------------- Albany	9W	Slight	Moderate	Moderate	Loblolly pine-------- Slash pine----------- Longleaf pine--------	95 85 80	9 11 7	Loblolly pine, slash pine.
CaC, CaD, CbB------ Carnegie	9A	Slight	Slight	Slight	Loblolly pine-------- Slash pine----------- Longleaf pine--------	86 86 72	9 11 6	Loblolly pine, slash pine.
CdA------------- Clarendon	9W	Slight	Moderate	Slight	Loblolly pine-------- Slash pine----------- Sweetgum------------	90 90 85	9 11 6	Loblolly pine, slash pine, American sycamore, yellow poplar, sweetgum.
CoB, CoC, CoD------ Cowarts	9A	Slight	Slight	Slight	Loblolly pine-------- Slash pine----------- Longleaf pine--------	86 86 67	9 11 5	Loblolly pine, longleaf pine, slash pine.
Cx-------------- Coxville	4W	Slight	Severe	Severe	Water oak----------- Blackgum------------ Baldcypress----------	65 68 65	4 6 2	American sycamore, water tupelo.
DoA, DoB----------- Dothan	12A	Slight	Slight	Slight	Slash pine----------- Longleaf pine-------- Loblolly pine--------	92 84 88	12 8 9	Slash pine, loblolly pine, longleaf pine.
EoB, EoC, EoD------ Esto	8A	Slight	Slight	Slight	Loblolly pine-------- Longleaf pine-------- Slash pine-----------	82 66 82	8 5 10	Loblolly pine, slash pine, longleaf pine.
EsB, EsD:								
Esto-------------	8A	Slight	Slight	Slight	Loblolly pine-------- Longleaf pine-------- Slash pine-----------	82 66 82	8 5 10	Loblolly pine, slash pine, longleaf pine.
Susquehanna-------	8C	Slight	Moderate	Slight	Loblolly pine-------- Shortleaf pine-------	78 68	8 7	Loblolly pine, shortleaf pine.
FrB------------- Freemanville	10A	Slight	Slight	Slight	Slash pine----------- Loblolly pine-------- Longleaf pine--------	80 80 66	10 8 5	Loblolly pine, slash pine, longleaf pine.
FsB, FsC----------- Fuquay	8S	Slight	Moderate	Moderate	Loblolly pine-------- Slash pine----------- Longleaf pine--------	83 83 67	8 10 5	Slash pine, longleaf pine.
He-------------- Herod	9W	Slight	Severe	Severe	Loblolly pine-------- Sweetgum------------ Water oak----------- Eastern cottonwood---	100 95 90 100	9 8 --- ---	Loblolly pine, slash pine, sweetgum, eastern cottonwood.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
HrA: Hornsville	9W	Slight	Moderate	Moderate	Loblolly pine	90	9	Loblolly pine, slash pine, sweetgum, yellow poplar.
					Slash pine	90	11	
					Sweetgum	90	7	
Ko: Kinston	9W	Slight	Severe	Severe	Loblolly pine	100	9	Loblolly pine, slash pine, American sycamore, yellow poplar, eastern cottonwood, cherrybark oak, green ash, sweetgum.
					Sweetgum	95	8	
					White oak	90	4	
					Eastern cottonwood	100	---	
					Cherrybark oak	95	4	
LaB: Lakeland	9S	Slight	Moderate	Moderate	Slash pine	75	9	
					Loblolly pine	75	7	
					Longleaf pine	60	4	
					Turkey oak	---	---	
					Blackjack oak	---	---	
					Post oak	---	---	
LeA: Leefield	9W	Slight	Moderate	Moderate	Loblolly pine	87	9	Loblolly pine, slash pine.
					Slash pine	84	11	
					Longleaf pine	75	6	
LmB, LmC: Lucy	12S	Slight	Moderate	Moderate	Slash pine	92	12	Slash pine, longleaf pine, loblolly pine.
					Longleaf pine	74	6	
					Loblolly pine	86	9	
NoA, NoB: Norfolk	9A	Slight	Slight	Slight	Loblolly pine	86	9	Slash pine, loblolly pine.
					Longleaf pine	72	6	
					Slash pine	86	11	
OcA: Ocilla	8W	Slight	Moderate	Moderate	Loblolly pine	85	8	Loblolly pine, slash pine.
					Slash pine	90	11	
					Longleaf pine	77	7	
OrB, OrC: Orangeburg	8A	Slight	Slight	Slight	Loblolly pine	80	8	Slash pine, loblolly pine.
					Slash pine	86	11	
					Longleaf pine	77	7	
Pe, Po: Pelham	11W	Slight	Severe	Severe	Slash pine	90	11	Slash pine, loblolly pine.
					Loblolly pine	90	9	
					Longleaf pine	80	7	
					Sweetgum	80	6	
					Blackgum	80	8	
					Water oak	80	---	
ReB: Red Bay	9A	Slight	Slight	Slight	Loblolly pine	90	9	Loblolly pine, slash pine, longleaf pine.
					Slash pine	90	11	
					Longleaf pine	77	7	
SeA: Stilson	9W	Slight	Moderate	Slight	Loblolly pine	95	9	Slash pine, loblolly pine, longleaf pine.
					Slash pine	95	12	
					Longleaf pine	80	7	
					Sweetgum	---	---	
TfA, TfB, TfC: Tifton	9A	Slight	Slight	Slight	Loblolly pine	86	9	Loblolly pine, slash pine.
					Slash pine	86	11	
					Longleaf pine	72	6	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns			Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	Productivity class*	
WaB----------------- Wagram	8S	Slight	Moderate	Moderate	Loblolly pine-------- Slash pine----------- Longleaf pine--------	81 79 72	8 10 6	Loblolly pine, slash pine, longleaf pine.
WeA----------------- Wahee	9W	Slight	Moderate	Moderate	Loblolly pine-------- Slash pine----------- Sweetgum------------- Blackgum------------- Water oak------------ Swamp chestnut oak--- Willow oak----------- Southern red oak-----	91 86 90 --- --- --- --- ---	9 11 7 --- --- --- --- ---	Loblolly pine, slash pine, sweetgum, American sycamore, water oak.

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

TABLE 9.--RECREATIONAL DEVELOPMENT

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

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AoA------------------- Albany	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
CaC------------------- Carnegie	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight----------	Slight.
CaD------------------- Carnegie	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight----------	Moderate: slope.
CbB------------------- Carnegie	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly, small stones.	Slight----------	Slight.
CdA------------------- Clarendon	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
CoB------------------- Cowarts	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight----------	Slight.
CoC------------------- Cowarts	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight----------	Slight.
CoD------------------- Cowarts	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight----------	Moderate: slope.
Cx-------------------- Coxville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
DoA-------------------	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
DoB------------------- Dothan	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
EoB------------------- Esto	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight----------	Slight.
EoC------------------- Esto	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight----------	Slight.
EoD------------------- Esto	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight----------	Moderate: slope.
EsB: Esto-----------------	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight----------	Slight.
EsB: Susquehanna----------	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Slight----------	Slight.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
EsD:					
Esto	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
Susquehanna	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Slight	Moderate: slope.
FrB Freemanville	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Slight	Slight.
FsB Fuquay	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
FsC Fuquay	Moderate: too sandy.	Moderate: too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty.
He Herod	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
HrA Hornsville	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly.	Slight	Slight.
Ko Kinston	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
LaB Lakeland	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
LeA Leefield	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
LmB Lucy	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
LmC Lucy	Moderate: too sandy.	Moderate: too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty.
NoA Norfolk	Slight	Slight	Slight	Slight	Slight.
NoB Norfolk	Slight	Slight	Moderate: slope.	Slight	Slight.
OcA Ocilla	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, droughty.
OrB Orangeburg	Slight	Slight	Moderate: slope.	Slight	Slight.
OrC Orangeburg	Slight	Slight	Severe: slope.	Slight	Slight.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Pe: Pelham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Po: Pelham	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
ReB: Red Bay	Slight	Slight	Moderate: slope.	Slight	Slight.
SeA: Stilson	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: droughty.
TfA: Tifton	Slight	Slight	Moderate: small stones.	Slight	Slight.
TfB: Tifton	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
TfC: Tifton	Slight	Slight	Severe: slope.	Slight	Slight.
WaB: Wagram	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
WeA: Wahee	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.

TABLE 10.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor"]

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AoA----------------- Albany	Fair	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Poor.
CaC----------------- Carnegie	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CaD----------------- Carnegie	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CbB----------------- Carnegie	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CdA----------------- Clarendon	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CoB, CoC, CoD------ Cowarts	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Cx------------------ Coxville	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
DoA, DoB----------- Dothan	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
EoB----------------- Esto	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EoC, EoD----------- Esto	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
EsB:										
Esto---------------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Susquehanna--------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
EsD:										
Esto---------------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Susquehanna--------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
FrB----------------- Freemanville	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
FsB----------------- Fuquay	Fair	Fair	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
FsC----------------- Fuquay	Poor	Fair	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
He------------------ Herod	Poor	Poor	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.

TABLE 10.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
HrA---------------- Hornsville	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Ko----------------- Kinston	Very poor.	Poor	Poor	Poor	Poor	Good	Fair	Poor	Poor	Fair.
LaB---------------- Lakeland	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
LeA---------------- Leefield	Fair	Fair	Good	Fair	Fair	Fair	Fair	Fair	Fair	Fair.
LmB, LmC----------- Lucy	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
NoA, NoB----------- Norfolk	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
OcA---------------- Ocilla	Fair	Fair	Good	Fair	Good	Fair	Fair	Fair	Good	Fair.
OrB---------------- Orangeburg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
OrC---------------- Orangeburg	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Pe, Po------------- Pelham	Poor	Poor	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair.
ReB---------------- Red Bay	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SeA---------------- Stilson	Fair	Fair	Good	Fair	Fair	Poor	Poor	Fair	Fair	Poor.
TfA---------------- Tifton	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
TfB---------------- Tifton	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
TfC---------------- Tifton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WaB---------------- Wagram	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WeA---------------- Wahee	Poor	Fair	Fair	Fair	Good	Fair	Fair	Fair	Good	Fair.

TABLE 11.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AoA--------------- Albany	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Severe: droughty.
CaC, CbB---------- Carnegie	Moderate: too clayey, dense layer.	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength.	Slight.
CaD--------------- Carnegie	Moderate: slope, too clayey, dense layer.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, low strength.	Moderate: slope.
CdA--------------- Clarendon	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
CoB--------------- Cowarts	Slight---------	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
CoC--------------- Cowarts	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
CoD--------------- Cowarts	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
Cx---------------- Coxville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
DoA, DoB---------- Dothan	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Slight.
EoB, EoC---------- Esto	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, shrink-swell.	Slight.
EoD--------------- Esto	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, shrink-swell, slope.	Moderate: slope.
EsB:						
Esto--------------	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, shrink-swell.	Slight.
Susquehanna-------	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
EsD:						
Esto--------------	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, shrink-swell, slope.	Moderate: slope.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
EsD:						
Susquehanna	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: slope.
FrB: Freemanville	Moderate: too clayey.	Slight	Slight	Slight	Moderate: low strength.	Slight.
FsB: Fuquay	Moderate: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
FsC: Fuquay	Moderate: cutbanks cave.	Slight	Moderate: wetness.	Moderate: slope.	Slight	Moderate: droughty.
He: Herod	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
HrA: Hornsville	Moderate: too clayey, wetness.	Slight	Moderate: wetness.	Slight	Moderate: low strength.	Slight.
Ko: Kinston	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding, low strength.	Severe: wetness, flooding.
LaB: Lakeland	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty, too sandy.
LeA: Leefield	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
LmB: Lucy	Moderate: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
LmC: Lucy	Moderate: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
NoA, NoB: Norfolk	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight	Slight.
OcA: Ocilla	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
OrB: Orangeburg	Slight	Slight	Slight	Slight	Slight	Slight.
OrC: Orangeburg	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
Pe: Pelham	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Po: Pelham	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
ReB: Red Bay	Slight	Slight	Slight	Slight	Slight	Slight.
SeA: Stilson	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
TfA, TfB: Tifton	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight	Slight.
TfC: Tifton	Moderate: wetness.	Slight	Moderate: wetness.	Moderate: slope.	Slight	Slight.
WaB: Wagram	Moderate: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
WeA: Wahee	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.

TABLE 12.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AoA: Albany	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy, wetness.
CaC, CbB: Carnegie	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
CaD: Carnegie	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
CdA: Clarendon	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
CoB, CoC: Cowarts	Severe: percs slowly.	Moderate: slope.	Slight	Slight	Good.
CoD: Cowarts	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
Cx: Coxville	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: wetness.
DoA: Dothan	Moderate: wetness, percs slowly.	Moderate: seepage.	Slight	Slight	Good.
DoB: Dothan	Moderate: wetness, percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
EoB, EoC: Esto	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
EoD: Esto	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
EsB:					
Esto	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
Susquehanna	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.

TABLE 12.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
EsD:					
Esto	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
Susquehanna	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
FrB Freemanville	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey, small stones.
FsB, FsC Fuquay	Moderate: percs slowly.	Moderate: slope.	Slight	Slight	Fair: too sandy.
He Herod	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
HrA Hornsville	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, hard to pack, wetness.
Ko Kinston	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
LaB Lakeland	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
LeA Leefield	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: wetness.
LmB, LmC Lucy	Slight	Moderate: seepage.	Slight	Slight	Good.
NoA, NoB Norfolk	Slight	Moderate: seepage.	Slight	Slight	Good.
OcA Ocilla	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: wetness.
OrB, OrC Orangeburg	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
Pe Pelham	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: wetness, seepage.	Poor: wetness.
Po Pelham	Severe: flooding, wetness.	Severe: seepage, wetness, flooding.	Severe: flooding, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness.

TABLE 12.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
ReB----------------- Red Bay	Slight-----------	Moderate: seepage, slope.	Slight-----------	Slight-----------	Good.
SeA----------------- Stilson	Severe: wetness.	Severe: seepage, wetness.	Moderate: wetness.	Severe: seepage.	Fair: wetness.
TfA----------------- Tifton	Moderate: percs slowly, wetness.	Moderate: seepage.	Slight-----------	Slight-----------	Fair: small stones.
TfB, TfC------------ Tifton	Moderate: percs slowly, wetness.	Moderate: slope, seepage.	Slight-----------	Slight-----------	Fair: small stones.
WaB----------------- Wagram	Slight-----------	Moderate: seepage.	Slight-----------	Slight-----------	Good.
WeA----------------- Wahee	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.

TABLE 13.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
AoA------------------ Albany	Fair: wetness.	Improbable: thin layer.	Improbable: excess fines.	Poor: too sandy.
CaC, CaD, CbB--------- Carnegie	Moderate: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
CdA------------------ Clarendon	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
CoB, CoC, CoD--------- Cowarts	Good----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Cx------------------- Coxville	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
DoA, DoB------------- Dothan	Good----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
EoB, EoC, EoD--------- Esto	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
EsB, EsD:				
Esto-----------------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Susquehanna----------	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
FrB------------------ Freemanville	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
FsB, FsC------------- Fuquay	Good----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
He------------------- Herod	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
HrA------------------ Hornsville	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Ko------------------- Kinston	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
LaB------------------ Lakeland	Good----------------	Probable------------	Improbable: too sandy.	Poor: too sandy.
LeA------------------ Leefield	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
LmB, LmC------------- Lucy	Good----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
NoA, NoB------------- Norfolk	Good----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
OcA------------------ Ocilla	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
OrB, OrC------------- Orangeburg	Good----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Pe, Po--------------- Pelham	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
ReB------------------ Red Bay	Good----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
SeA------------------ Stilson	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
TfA, TfB, TfC-------- Tifton	Good----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
WaB------------------ Wagram	Good----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
WeA------------------ Wahee	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, too clayey.

TABLE 14.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
AoA--------------- Albany	Severe: seepage.	Severe: seepage, piping, wetness.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.
CaC, CbB---------- Carnegie	Slight----------	Slight----------	Deep to water	Slope-----------	Favorable------	Favorable.
CaD--------------- Carnegie	Slight----------	Slight----------	Deep to water	Slope-----------	Slope-----------	Slope.
CdA--------------- Clarendon	Moderate: seepage.	Moderate: wetness.	Favorable------	Wetness---------	Wetness---------	Favorable.
CoB, CoC---------- Cowarts	Slight----------	Slight----------	Deep to water	Percs slowly, slope.	Percs slowly---	Percs slowly.
CoD--------------- Cowarts	Slight----------	Slight----------	Deep to water	Percs slowly, slope.	Slope, percs slowly.	Slope, percs slowly.
Cx---------------- Coxville	Slight----------	Severe: wetness.	Favorable------	Wetness---------	Wetness---------	Wetness.
DoA--------------- Dothan	Moderate: seepage.	Slight----------	Deep to water	Favorable------	Favorable------	Favorable.
DoB--------------- Dothan	Moderate: seepage.	Slight----------	Deep to water	Slope-----------	Favorable------	Favorable.
EoB, EoC---------- Esto	Slight----------	Severe: hard to pack.	Deep to water	Percs slowly, slope.	Percs slowly---	Percs slowly.
EoD--------------- Esto	Slight----------	Severe: hard to pack.	Deep to water	Percs slowly, slope.	Slope, percs slowly.	Slope, percs slowly.
EsB: Esto--------------	Slight----------	Severe: hard to pack.	Deep to water	Percs slowly, slope.	Percs slowly---	Percs slowly.
Susquehanna-------	Slight----------	Severe: hard to pack.	Percs slowly, slope.	Percs slowly, slope.	Percs slowly---	Percs slowly.
EsD: Esto--------------	Slight----------	Severe: hard to pack.	Deep to water	Percs slowly, slope.	Slope, percs slowly.	Slope, percs slowly.
EsD: Susquehanna-------	Slight----------	Severe: hard to pack.	Percs slowly, slope.	Percs slowly, slope.	Percs slowly, slope.	Percs slowly, slope.
FrB--------------- Freemanville	Slight----------	Moderate: piping.	Deep to water	Slope-----------	Favorable------	Favorable.
FsB--------------- Fuquay	Moderate: seepage.	Slight----------	Deep to water	Droughty, fast intake.	Too sandy------	Droughty.

TABLE 14.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
FsC: Fuquay	Moderate: seepage.	Slight	Deep to water	Droughty, fast intake, slope.	Too sandy	Droughty.
He: Herod	Moderate: seepage.	Severe: wetness.	Flooding	Wetness, flooding.	Wetness	Wetness.
HrA: Hornsville	Moderate: seepage.	Moderate: hard to pack, wetness.	Favorable	Wetness.	Wetness.	Favorable.
Ko: Kinston	Moderate: seepage.	Severe: wetness.	Flooding	Wetness, flooding.	Wetness	Wetness.
LaB: Lakeland	Severe: seepage.	Severe: seepage.	Deep to water	Droughty, fast intake.	Too sandy.	Droughty.
LeA: Leefield	Moderate: seepage.	Severe: piping, wetness.	Favorable	Wetness, droughty, fast intake.	Wetness	Droughty.
LmB: Lucy	Moderate: seepage.	Slight	Deep to water	Droughty, fast intake.	Too sandy	Droughty.
LmC: Lucy	Moderate: seepage.	Slight	Deep to water	Droughty, fast intake, slope.	Too sandy	Droughty.
NoA: Norfolk	Moderate: seepage.	Slight	Deep to water	Favorable	Favorable	Favorable.
NoB: Norfolk	Moderate: seepage.	Slight	Deep to water	Slope	Favorable	Favorable.
OcA: Ocilla	Severe: seepage.	Severe: piping, wetness.	Favorable	Wetness, droughty, fast intake.	Wetness	Droughty.
OrB, OrC: Orangeburg	Moderate: seepage.	Slight	Deep to water	Slope	Favorable	Favorable.
Pe: Pelham	Severe: seepage.	Severe: piping, wetness.	Favorable	Fast intake, wetness.	Wetness	Wetness, droughty.
Po: Pelham	Severe: seepage.	Severe: piping, wetness.	Flooding	Flooding, fast intake, wetness.	Wetness	Wetness, droughty.
ReB: Red Bay	Moderate: seepage.	Slight	Deep to water	Slope	Favorable	Favorable.
SeA: Stilson	Moderate: seepage.	Severe: piping.	Favorable	Wetness, droughty.	Wetness	Droughty.
TfA: Tifton	Moderate: seepage.	Slight	Deep to water	Favorable	Favorable	Favorable.

TABLE 14.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
TfB, TfC---------- Tifton	Moderate: seepage.	Slight---------	Deep to water	Slope----------	Favorable------	Favorable.
WaB--------------- Wagram	Moderate: seepage.	Slight---------	Deep to water	Droughty, fast intake.	Too sandy------	Droughty.
WeA--------------- Wahee	Slight---------	Severe: wetness.	Percs slowly, flooding.	Wetness, percs slowly, flooding.	Wetness, percs slowly.	Wetness, percs slowly.

TABLE 15.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than. Absence of an entry indicates that data were not estimated. Some soils may have Unified classifications and USDA textures in addition to those shown. In general, the dominant classifications and textures are shown]

Map symbol and soil name	Depth	USDA texture	Classification		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	4	10	40	200		
	In								Pct	
AoA------------ Albany	0-53	Sand------------	SM, SP-SM	A-2	100	100	75-90	10-20	---	NP
	53-64	Sandy loam-------	SM	A-2	100	100	75-92	22-30	---	NP
	64-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM, SM-SC	A-2, A-4, A-6	97-100	95-100	70-100	20-50	<40	NP-17
CaC, CaD--------- Carnegie	0-5	Sandy loam-------	SM, SM-SC	A-2	85-100	75-95	51-75	13-30	<25	NP-5
	5-9	Sandy clay, sandy clay loam.	CL	A-6, A-7	95-100	90-99	90-95	65-70	36-49	13-25
	9-29	Sandy clay, clay	CL	A-6, A-7	92-100	90-98	89-98	63-76	36-49	13-25
	29-65	Sandy clay, clay	CL	A-7, A-6	99-100	98-100	90-98	68-79	36-49	13-25
CbB------------- Carnegie	0-6	Gravelly sandy loam.	SM, SM-SC	A-2	85-100	75-95	51-75	13-30	<25	NP-5
	6-9	Sandy clay, sandy clay loam.	CL	A-6, A-7	95-100	90-99	90-95	65-70	36-49	13-25
	9-29	Sandy clay, clay	CL	A-6, A-7	92-100	90-98	89-98	63-76	36-49	13-25
	29-70	Sandy clay, clay	CL	A-7, A-6	99-100	98-100	90-98	68-79	36-49	13-25
CdA------------- Clarendon	0-13	Loamy sand-------	SM, SP-SM	A-2	98-100	85-100	65-90	10-30	<20	NP-3
	13-44	Sandy clay loam	SC, CL, SM-SC, CL-ML	A-4, A-6	98-100	85-100	75-95	36-55	20-40	5-15
	44-65	Sandy clay loam, sandy loam, sandy clay.	SC, CL, SM-SC, CL-ML	A-2, A-4, A-6	99-100	96-100	80-95	25-55	<40	NP-15
CoB, CoC, CoD---- Cowarts	0-10	Loamy sand-------	SM	A-2	90-100	85-100	50-80	13-30	---	NP
	10-14	Fine sandy loam, sandy loam, sandy clay loam.	SM-SC, SC, SM	A-2, A-4, A-6	95-100	90-100	60-90	23-45	20-40	NP-15
	14-36	Sandy clay loam, sandy clay.	SM-SC, SM, SC	A-6, A-7	95-100	90-100	60-90	25-50	30-54	11-23
	36-65	Sandy loam, sandy clay loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6, A-7	85-100	80-100	60-95	30-58	25-53	5-20
Cx-------------- Coxville	0-6	Fine sandy loam	SM, ML, CL-ML, CL	A-4, A-6, A-7	100	100	85-97	46-75	20-46	3-15
	6-65	Clay loam, sandy clay, clay.	CL, CH	A-6, A-7	100	100	85-98	50-85	30-55	12-35
DoA, DoB--------- Dothan	0-9	Loamy sand-------	SM	A-2	95-100	92-100	60-80	13-30	---	NP
	9-35	Sandy clay loam, sandy loam, fine sandy loam.	SM-SC, SC, SM	A-2, A-4, A-6	95-100	92-100	68-90	23-49	<40	NP-16
	35-65	Sandy clay loam, sandy clay.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6, A-7	95-100	92-100	70-95	30-53	25-45	4-23
EoB, EoC, EoD---- Esto	0-5	Loamy sand-------	SM, SP-SM	A-2	90-100	85-100	50-85	10-35	---	NP
	5-13	Clay loam, sandy clay, sandy clay loam.	CL, SC	A-6, A-7	95-100	85-100	85-100	45-90	35-50	12-25
	13-65	Clay loam, clay, sandy clay.	CL, CH, ML	A-7	95-100	85-100	85-100	51-98	40-80	16-52

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In								Pct	
EsB, EsD:										
Esto------------	0-5	Loamy sand-------	SM, SP-SM	A-2	90-100	85-100	50-85	10-35	---	NP
	5-13	Clay loam, sandy clay, sandy clay loam.	CL, SC	A-6, A-7	95-100	85-100	85-100	45-90	35-50	12-25
	13-65	Clay loam, clay, sandy clay.	CL, CH, ML	A-7	95-100	85-100	85-100	51-98	40-80	16-52
Susquehanna-----	0-4	Loamy sand-------	SM	A-2	98-100	95-100	60-80	15-30	---	NP
	4-62	Clay, silty clay loam, silty clay.	CH	A-7	100	100	88-100	75-98	50-90	27-56
FrB-------------- Freemanville	0-10	Sandy loam-------	SM, SP-SM	A-1, A-2, A-4	65-90	50-85	45-80	10-40	<30	NP-5
	10-14	Loam, clay loam, sandy clay loam.	SC, CL, CL-ML, SM-SC	A-4, A-6	85-95	65-85	60-80	40-60	20-35	4-15
	14-96	Clay, clay loam, sandy clay.	SC, CL	A-6, A-7	85-95	65-85	60-80	40-60	30-45	11-25
FsB, FsC--------- Fuquay	0-26	Loamy sand-------	SP-SM, SM	A-2, A-3	95-100	90-100	50-83	5-35	---	NP
	26-38	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	85-100	85-100	70-90	23-45	<25	NP-13
	38-80	Sandy clay loam	SC, SM-SC, CL-ML	A-2, A-4, A-6, A-7-6	95-100	90-100	58-90	28-49	20-49	4-12
He--------------- Herod	0-10	Sandy loam-------	SM, SM-SC	A-2, A-4	100	95-100	50-90	30-49	<30	NP-7
	10-36	Clay loam, sandy clay loam, loam.	CL, SC	A-6, A-4	100	95-100	80-100	45-85	25-40	8-20
	36-60	Sandy loam, sandy clay loam.	CL, SM, ML, SC	A-4, A-6	100	95-100	70-90	36-60	<30	NP-15
HrA-------------- Hornsville	0-11	Fine sandy loam	SM	A-2-4, A-4	100	100	60-95	30-50	<30	NP-7
	11-36	Sandy clay, clay loam, clay.	SC, CL, CH	A-6, A-7	100	100	70-98	45-70	38-56	15-25
	36-82	Sandy clay loam, sandy loam, fine sandy loam.	SM, SM-SC, SC	A-2-4, A-2-6, A-4, A-6	100	100	60-100	18-50	<30	NP-12
Ko--------------- Kinston	0-12	Fine sandy loam	SM, SC, SM-SC	A-2, A-4	100	98-100	55-100	25-49	<35	NP-10
	12-60	Loam, clay loam, sandy clay loam.	CL	A-4, A-6, A-7	100	95-100	75-100	60-95	20-45	8-22
	60-66	Variable---------	---	---	---	---	---	---	---	---
LaB-------------- Lakeland	0-40	Sand-------------	SP-SM	A-3, A-2-4	90-100	90-100	60-100	5-12	---	NP
	40-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	90-100	90-100	50-100	1-12	---	NP
LeA-------------- Leefield	0-25	Loamy sand-------	SM, SW-SM, SP-SM	A-2	98-100	95-100	65-95	10-20	---	NP
	25-41	Sandy loam, sandy clay loam.	SC, SM, SM-SC	A-2, A-4, A-6	95-100	93-100	65-95	20-40	<40	NP-16
	41-60	Sandy loam, sandy clay loam.	SC, SM, SM-SC	A-2, A-4, A-6	95-100	95-100	65-90	20-40	<40	NP-20

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	4	10	40	200		
	In								Pct	
LmB, LmC--------- Lucy	0-34	Loamy sand-------	SM, SP-SM	A-2	98-100	95-100	50-87	16-30	---	NP
	34-42	Sandy loam, fine sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	97-100	95-100	55-95	15-50	16-30	NP-15
	42-72	Sandy loam, sandy clay loam, clay loam.	SC, SM-SC, SM	A-2, A-6, A-4	100	95-100	60-95	20-50	20-40	3-20
NoA, NoB--------- Norfolk	0-8	Loamy sand-------	SM	A-2	95-100	92-100	50-95	13-30	<20	NP
	8-32	Sandy loam, sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	95-100	91-100	70-96	30-63	20-38	4-15
	32-65	Sandy clay loam, clay loam, sandy clay.	SC, SM-SC, CL, CL-ML	A-4, A-6, A-7-6	100	98-100	65-98	36-72	20-52	4-23
OcA-------------- Ocilla	0-32	Loamy sand-------	SM, SP-SM	A-2, A-3	100	95-100	75-100	8-35	---	NP
	32-48	Sandy loam, sandy clay loam.	SM, CL, SC, ML	A-2, A-4, A-6	100	95-100	80-100	20-55	20-40	NP-18
	48-80	Sandy clay loam, sandy clay, sandy loam.	SC, CL	A-4, A-5, A-6, A-7	100	95-100	80-100	36-60	20-45	7-20
OrB, OrC--------- Orangeburg	0-8	Loamy sand-------	SM	A-2	98-100	95-100	60-87	14-28	---	NP
	8-12	Sandy loam-------	SM	A-2	98-100	95-100	70-96	25-35	<30	NP-4
	12-72	Sandy clay loam, sandy loam.	SC, CL, SM, SM-SC	A-6, A-4	98-100	95-100	71-96	38-58	22-40	3-19
Pe, Po----------- Pelham	0-26	Loamy sand-------	SM	A-2	100	95-100	75-90	15-30	---	NP
	26-32	Sandy clay loam, sandy loam, fine sandy loam.	SM, SC, SM-SC	A-2, A-4, A-6	100	95-100	65-90	27-50	16-30	2-12
	32-80	Sandy clay loam, sandy loam, sandy clay.	SC, SM, ML, CL	A-2, A-4, A-6, A-7	100	95-100	65-90	27-65	20-45	3-20
ReB-------------- Red Bay	0-8	Loamy sand-------	SM	A-2	100	90-100	51-75	15-30	---	NP
	8-17	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4	100	95-100	60-85	15-50	<35	NP-10
	17-96	Sandy clay loam	SM-SC, SC	A-2, A-4, A-6	100	95-100	70-90	24-50	18-40	4-16
SeA-------------- Stilson	0-25	Loamy sand-------	SM	A-2	94-100	94-100	74-92	15-24	---	NP
	25-45	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-6, A-4	89-100	86-100	77-94	25-41	<29	NP-13
	45-64	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-6, A-4	96-100	95-100	70-99	25-50	<40	NP-20
TfA, TfB, TfC---- Tifton	0-10	Loamy sand-------	SM, SP-SM	A-2	70-97	62-94	53-85	11-27	---	NP
	10-16	Sandy loam, sandy clay loam, gravelly sandy clay loam.	SM, SM-SC	A-2	70-95	56-89	55-89	20-35	<25	NP-7
	16-42	Sandy clay loam, gravelly sandy clay loam.	SC, CL	A-2, A-6, A-4	70-98	65-94	60-89	22-53	22-40	8-22
	42-80	Sandy clay loam, sandy clay.	SC, CL	A-2, A-6, A-7, A-4	87-100	80-99	50-94	34-55	24-45	8-23

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	4	10	40	200		
	In								Pct	
WaB-------------- Wagram	0-30	Loamy sand-------	SM, SP-SM	A-2, A-3	100	98-100	50-85	8-35	---	NP
	30-96	Sandy clay loam, sandy loam.	SC	A-2, A-4, A-6, A-7	100	98-100	60-95	31-49	21-41	8-25
WeA-------------- Wahee	0-12	Fine sandy loam	SM, SM-SC	A-2, A-4	100	95-100	50-98	30-50	<28	NP-7
	12-50	Clay, clay loam, silty clay.	CL, CH	A-6, A-7	100	100	85-100	51-90	38-70	18-42
	50-65	Variable---------	---	---	---	---	---	---	---	---

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
AoA----------------- Albany	0-53	1-10	1.40-1.55	6.0-20	0.02-0.04	4.5-6.5	Low-----------	0.10	5	1-2
	53-64	1-20	1.50-1.70	2.0-6.0	0.08-0.10	4.5-6.0	Low-----------	0.20		
	64-80	13-35	1.55-1.65	0.6-2.0	0.10-0.16	4.5-6.0	Low-----------	0.24		
CaC, CaD--------- Carnegie	0-5	3-8	1.45-1.90	2.0-6.0	0.05-0.08	4.5-6.0	Low-----------	0.28	3	1-2
	5-9	36-43	1.30-1.75	0.2-0.6	0.10-0.14	4.5-5.5	Low-----------	0.32		
	9-29	36-51	1.40-1.90	0.2-0.6	0.10-0.12	4.5-5.5	Low-----------	0.28		
	29-65	36-55	1.40-1.90	0.2-0.6	0.10-0.12	4.5-5.5	Low-----------	0.28		
CbB-------------- Carnegie	0-6	3-8	1.45-1.90	2.0-6.0	0.05-0.08	4.5-6.0	Low-----------	0.28	3	1-2
	6-9	36-43	1.30-1.75	0.2-0.6	0.10-0.14	4.5-5.5	Low-----------	0.32		
	9-29	36-51	1.40-1.90	0.2-0.6	0.10-0.12	4.5-5.5	Low-----------	0.28		
	29-70	36-55	1.40-1.90	0.2-0.6	0.10-0.12	4.5-5.5	Low-----------	0.28		
CdA-------------- Clarendon	0-13	2-10	1.40-1.60	2.0-6.0	0.08-0.12	4.5-6.5	Low-----------	0.15	5	.5-3
	13-44	18-35	1.40-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low-----------	0.20		
	44-65	15-40	1.40-1.70	0.2-0.6	0.08-0.12	4.5-5.5	Low-----------	0.15		
CoB, CoC, CoD---- Cowarts	0-10	3-10	1.30-1.70	2.0-6.0	0.06-0.10	4.5-6.0	Low-----------	0.15	3	<1
	10-14	10-30	1.30-1.50	0.6-2.0	0.10-0.14	4.5-5.5	Low-----------	0.28		
	14-36	25-40	1.30-1.50	0.2-2.0	0.10-0.16	4.5-5.5	Low-----------	0.28		
	36-65	18-35	1.45-1.75	0.06-0.6	0.08-0.12	4.5-5.5	Low-----------	0.24		
Cx--------------- Coxville	0-6	5-27	1.45-1.65	0.6-2.0	0.12-0.17	4.5-5.5	Low-----------	0.24	5	2-4
	6-65	35-60	1.25-1.45	0.2-0.6	0.14-0.18	4.5-5.5	Moderate------	0.32		
DoA, DoB--------- Dothan	0-9	5-15	1.30-1.60	2.0-6.0	0.06-0.10	4.5-6.0	Very low------	0.15	5	<.5
	9-35	18-35	1.40-1.60	0.6-2.0	0.12-0.16	4.5-6.0	Low-----------	0.28		
	35-65	18-40	1.45-1.70	0.2-0.6	0.08-0.12	4.5-6.0	Low-----------	0.28		
EoB, EoC, EoD---- Esto	0-5	7-12	1.45-1.65	6.0-20	0.06-0.10	4.5-6.0	Low-----------	0.17	3	<1
	5-13	26-45	1.55-1.65	0.6-2.0	0.12-0.17	4.5-5.5	Moderate------	0.32		
	13-65	35-60	1.50-1.65	0.06-0.2	0.12-0.18	4.5-5.5	Moderate------	0.32		
EsB, EsD:										
Esto------------	0-5	7-12	1.45-1.65	6.0-20	0.06-0.10	4.5-6.0	Low-----------	0.17	3	<1
	5-13	26-45	1.55-1.65	0.6-2.0	0.12-0.17	4.5-5.5	Moderate------	0.32		
	13-65	35-60	1.50-1.65	0.06-0.2	0.12-0.18	4.5-5.5	Moderate------	0.32		
Susquehanna-----	0-4	2-10	1.45-1.50	6.0-20	0.05-0.09	4.5-6.0	Low-----------	0.17	5	---
	4-62	35-60	1.25-1.50	<0.06	0.15-0.20	4.5-5.5	High----------	0.32		
FrB-------------- Freemanville	0-10	7-20	---	0.6-2.0	0.11-0.18	5.1-6.0	Low-----------	0.24	4	<1
	10-14	15-35	---	0.6-2.0	0.12-0.18	5.1-5.5	Low-----------	0.28		
	14-96	35-45	---	0.2-0.6	0.12-0.16	5.1-5.5	Low-----------	0.28		
FsB, FsC--------- Fuquay	0-26	2-10	1.60-1.70	>6.0	0.04-0.09	4.5-6.0	Low-----------	0.15	5	.5-2
	26-38	10-35	1.40-1.60	0.6-2.0	0.12-0.15	4.5-5.5	Low-----------	0.20		
	38-80	20-35	1.40-1.60	0.06-0.2	0.10-0.13	4.5-5.5	Low-----------	0.20		
He--------------- Herod	0-10	10-20	1.30-1.55	0.6-2.0	0.10-0.16	5.1-6.0	Low-----------	0.24	5	2-6
	10-36	20-35	1.30-1.50	0.6-2.0	0.14-0.20	5.6-7.3	Low-----------	0.20		
	36-60	10-30	1.30-1.50	0.6-2.0	0.12-0.16	5.6-7.3	Low-----------	0.20		

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH				Pct
HrA---------------- Hornsville	0-11	6-15	1.44-1.68	6.0-20	0.08-0.12	5.1-6.0	Low-----------	0.20	5	1-4
	11-36	35-60	1.58-1.63	0.2-0.6	0.12-0.16	5.1-5.5	Low-----------	0.28		
	36-82	12-35	1.62-1.69	0.6-2.0	0.10-0.14	5.1-5.5	Low-----------	0.24		
Ko----------------- Kinston	0-12	5-18	1.40-1.60	2.0-6.0	0.13-0.19	4.5-5.5	Low-----------	0.24	5	2-5
	12-60	18-35	1.30-1.50	0.6-2.0	0.14-0.18	4.5-5.5	Low-----------	0.32		
	60-66	---	---	---	---	---	-------------	----		
LaB---------------- Lakeland	0-40	2-8	1.35-1.65	6.0-20	0.05-0.09	4.5-6.0	Low-----------	0.10	5	<1
	40-80	1-6	1.50-1.60	6.0-20	0.02-0.08	4.5-5.5	Low-----------	0.10		
LeA---------------- Leefield	0-25	5-10	1.45-1.60	6.0-20	0.04-0.07	4.5-6.0	Low-----------	0.10	5	1-2
	25-41	15-25	1.50-1.65	0.6-2.0	0.10-0.13	4.5-5.5	Low-----------	0.15		
	41-60	15-30	1.50-1.70	0.2-0.6	0.08-0.12	4.5-5.5	Low-----------	0.10		
LmB, LmC----------- Lucy	0-34	1-12	1.30-1.70	6.0-20	0.06-0.10	5.1-6.0	Low-----------	0.15	5	.5-1
	34-42	10-30	1.40-1.60	2.0-6.0	0.10-0.12	4.5-5.5	Low-----------	0.24		
	42-72	15-35	1.40-1.60	0.6-2.0	0.12-0.14	4.5-5.5	Low-----------	0.28		
NoA, NoB----------- Norfolk	0-8	2-8	1.55-1.75	6.0-20	0.06-0.11	4.5-6.0	Low-----------	0.20	5	.5-2
	8-32	18-35	1.30-1.45	0.6-2.0	0.10-0.20	4.5-5.5	Low-----------	0.24		
	32-65	20-43	1.10-1.40	0.06-2.0	0.10-0.15	4.5-5.5	Low-----------	0.24		
OcA---------------- Ocilla	0-32	4-10	1.45-1.65	2.0-20	0.05-0.08	4.5-6.0	Low-----------	0.10	5	1-2
	32-48	15-35	1.55-1.70	0.6-2.0	0.09-0.12	4.5-5.5	Low-----------	0.24		
	48-80	15-40	1.55-1.70	0.6-2.0	0.09-0.12	4.5-5.5	Low-----------	0.24		
OrB, OrC----------- Orangeburg	0-8	4-10	1.35-1.55	2.0-6.0	0.06-0.09	4.5-6.0	Low-----------	0.10	5	.5-1
	8-12	7-18	1.50-1.65	2.0-6.0	0.09-0.12	4.5-5.5	Low-----------	0.20		
	12-72	18-35	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	Low-----------	0.24		
Pe, Po------------- Pelham	0-26	5-10	1.50-1.70	6.0-20	0.05-0.08	4.5-6.0	Very low------	0.10	5	1-2
	26-32	15-30	1.30-1.60	0.6-2.0	0.10-0.13	4.5-5.5	Low-----------	0.24		
	32-80	15-40	1.30-1.60	0.6-2.0	0.10-0.16	4.5-5.5	Low-----------	0.24		
ReB---------------- Red Bay	0-8	4-12	1.45-1.60	6.0-20	0.06-0.11	4.5-6.0	Low-----------	0.10	5	<2
	8-17	10-25	1.30-1.60	0.6-6.0	0.10-0.14	4.5-5.5	Low-----------	0.15		
	17-96	18-35	1.30-1.50	0.6-2.0	0.12-0.17	4.5-5.5	Low-----------	0.17		
SeA---------------- Stilson	0-25	3-8	1.35-1.60	6.0-20	0.06-0.09	4.5-6.0	Low-----------	0.10	5	.5-1
	25-45	15-30	1.40-1.60	0.6-2.0	0.09-0.12	4.5-5.5	Low-----------	0.24		
	45-64	15-35	1.40-1.60	0.6-2.0	0.08-0.10	4.5-5.5	Low-----------	0.17		
TfA, TfB, TfC------ Tifton	0-10	3-8	1.30-1.55	6.0-20	0.03-0.08	4.5-6.0	Low-----------	0.10	4	<1
	10-16	13-22	1.45-1.65	6.0-20	0.08-0.12	4.5-5.5	Low-----------	0.24		
	16-42	20-35	1.50-1.70	0.6-2.0	0.12-0.16	4.5-5.5	Low-----------	0.24		
	42-80	25-40	1.55-1.80	0.2-0.6	0.10-0.13	4.5-5.5	Low-----------	0.17		
WaB---------------- Wagram	0-30	2-10	1.60-1.75	6.0-20	0.05-0.08	4.5-6.0	Low-----------	0.15	5	.5-2
	30-96	10-35	1.35-1.60	0.6-2.0	0.12-0.16	4.5-5.5	Low-----------	0.20		
WeA---------------- Wahee	0-12	5-20	1.30-1.60	0.6-2.0	0.10-0.15	4.5-6.0	Low-----------	0.24	5	.5-5
	12-50	35-55	1.40-1.60	0.06-0.2	0.12-0.20	4.5-5.5	Moderate------	0.28		
	50-65	---	---	0.2-0.6	0.12-0.20	4.5-5.5	Moderate------	0.28		

TABLE 17.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "brief," "apparent," and "perched" are explained in the text. The symbol > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Map symbol and soil name	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
AoA---------------- Albany	C	None---------	---	---	1.5-2.5	Apparent	Dec-Mar	High------	High.
CaC, CaD, CbB------ Carnegie	C	None---------	---	---	>6.0	---	---	Low-------	Moderate.
CdA---------------- Clarendon	C	None---------	---	---	2.0-3.0	Apparent	Dec-Mar	Moderate	High.
CoB, CoC, CoD------ Cowarts	C	None---------	---	---	>6.0	---	---	Moderate	Moderate.
Cx----------------- Coxville	D	None---------	---	---	0-1.5	Apparent	Nov-Apr	High------	High.
DoA, DoB----------- Dothan	B	None---------	---	---	3.0-5.0	Perched	Jan-Apr	Moderate	Moderate.
EoB, EoC, EoD------ Esto	B	None---------	---	---	>6.0	---	---	High------	High.
EsB, EsD:									
Esto--------------	B	None---------	---	---	>6.0	---	---	High------	High.
Susquehanna-------	D	None---------	---	---	>6.0	---	---	High------	High.
FrB---------------- Freemanville	B	None---------	---	---	>6.0	---	---	Moderate	Moderate.
FsB, FsC----------- Fuquay	B	None---------	---	---	4.0-6.0	Perched	Jan-Mar	Low-------	High.
He----------------- Herod	D	Frequent-----	Brief------	Nov-Apr	0.5-1.5	Apparent	Dec-Mar	High------	Moderate.
HrA---------------- Hornsville	C	None---------	---	---	2.5-3.5	Apparent	Dec-Apr	High------	High.
Ko----------------- Kinston	B/D	Frequent-----	Brief------	Nov-Jun	0-1.0	Apparent	Nov-Jun	High------	High.
LaB---------------- Lakeland	A	None---------	---	---	>6.0	---	---	Low-------	Moderate.
LeA---------------- Leefield	C	None---------	---	---	1.5-2.5	Apparent	Dec-Mar	Moderate	High.
LmB, LmC----------- Lucy	A	None---------	---	---	>6.0	---	---	Low-------	High.
NoA, NoB----------- Norfolk	B	None---------	---	---	4.0-6.0	Apparent	Jan-Mar	Moderate	High.
OcA---------------- Ocilla	C	None---------	---	---	1.0-2.5	Apparent	Dec-Apr	High------	Moderate.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
OrB, OrC: Orangeburg	B	None	---	---	>6.0	---	---	Moderate	Moderate.
Pe: Pelham	B/D	None	---	---	0.5-1.5	Apparent	Jan-Apr	High	High.
Po: Pelham	B/D	Occasional	Brief	Dec-Mar	0.5-1.5	Apparent	Jan-Apr	High	High.
ReB: Red Bay	B	None	---	---	>6.0	---	---	Moderate	Moderate.
SeA: Stilson	B	None	---	---	2.5-3.0	Apparent	Dec-Apr	Moderate	High.
TfA, TfB, TfC: Tifton	B	None	---	---	3.5-6.0	Perched	Jan-Feb	Low	Moderate.
WaB: Wagram	A	None	---	---	>6.0	---	---	Low	High.
WeA: Wahee	D	Frequent	Very brief to brief.	Dec-Apr	0.5-1.5	Apparent	Dec-Mar	High	High.

TABLE 18.--ENGINEERING INDEX TEST DATA

[Dashes indicate data were not available. NP means nonplastic]

Soil name, sample number, horizon, and depth (in inches)	Classification		Grain-size distribution								Liquid limit	Plasticity index	Moisture density		Percentage volume change		
			Percentage passing sieve--					Percentage smaller than--									
	AASHTO	Unified	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			Maximum dry density	Optimum moisture	Total	Swell	Shrink
											Pct		Lb/ft^3	Pct	Pct	Pct	Pct
Esto loamy sand: *																	
(S71GA159-002)																	
Ap ------ 0-5	A-2-4(0)	SM	100	100	100	81	22	15	11	9	---	NP	123	9	10.2	1.0	9.2
Bt3 ------ 13-29	A-7-6(10)	ML	100	100	100	91	67	56	53	52	44	16	92	23	8.6	3.9	4.7
Bt4 ------ 29-62	A-7-6(15)	CH	100	100	100	90	61	55	52	51	55	26	91	23	14.3	5.6	8.7
Susquehanna loamy sand: **																	
(S71GA159-001)																	
Ap ---- 0-4	A-2-4(0)	SM	100	98	95	78	24	12	10	9	---	NP	114	13	7.4	6.9	0.5
Bt2 ---- 10-32	A-7-6(20)	CH	100	100	100	97	75	63	59	55	51	27	91	25	23.8	3.8	20.0
Bt3 ---- 32-55	A-7-6(32)	CH	100	100	100	99	80	68	61	58	63	38	92	27	37.8	18.1	19.7

* 0.5 mile generally northeast of Warwick on county road from Georgia Highway 313; 40 feet south of road.

** 3.6 miles west of city limits of Sylvester, Georgia, on U.S. Highway 82; 300 feet north on county road; 300 feet east on county road; 30 feet north of road.

TABLE 19.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Albany	Loamy, siliceous, thermic Grossarenic Paleudults
Carnegie	Clayey, kaolinitic, thermic Plinthic Paleudults
Clarendon	Fine-loamy, siliceous, thermic Plinthaquic Paleudults
Cowarts	Fine-loamy, siliceous, thermic Typic Hapludults
Coxville	Clayey, kaolinitic, thermic Typic Paleaquults
Dothan	Fine-loamy, siliceous, thermic Plinthic Paleudults
Esto	Clayey, kaolinitic, thermic Typic Paleudults
Freemanville	Clayey, kaolinitic, thermic Plinthic Paleudults
Fuquay	Loamy, siliceous, thermic Arenic Plinthic Paleudults
Herod	Fine-loamy, siliceous, nonacid, thermic Typic Fluvaquents
Hornsville	Clayey, kaolinitic, thermic Aquic Hapludults
Kinston	Fine-loamy, siliceous, acid, thermic Typic Fluvaquents
Lakeland	Thermic, coated Typic Quartzipsamments
Leefield	Loamy, siliceous, thermic Arenic Plinthaquic Paleudults
Lucy	Loamy, siliceous, thermic Arenic Paleudults
Norfolk	Fine-loamy, siliceous, thermic Typic Paleudults
Ocilla	Loamy, siliceous, thermic Aquic Arenic Paleudults
Orangeburg	Fine-loamy, siliceous, thermic Typic Paleudults
Pelham	Loamy, siliceous, thermic Arenic Paleaquults
Red Bay	Fine-loamy, siliceous, thermic Rhodic Paleudults
Stilson	Loamy, siliceous, thermic Arenic Plinthic Paleudults
Susquehanna	Fine, montmorillonitic, thermic Vertic Paleudalfs
Tifton	Fine-loamy, siliceous, thermic Plinthic Paleudults
Wagram	Loamy, siliceous, thermic Arenic Paleudults
Wahee	Clayey, mixed, thermic Aeric Ochraquults

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