United States
Department of
Agriculture

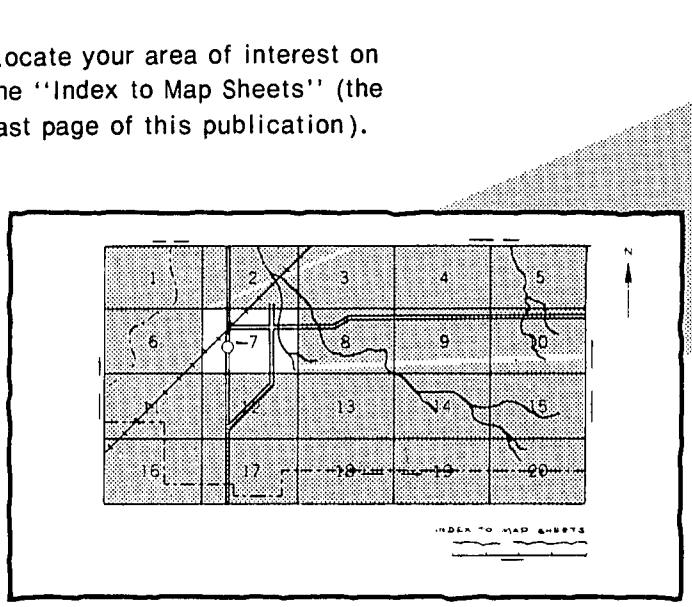
Soil
Conservation
Service

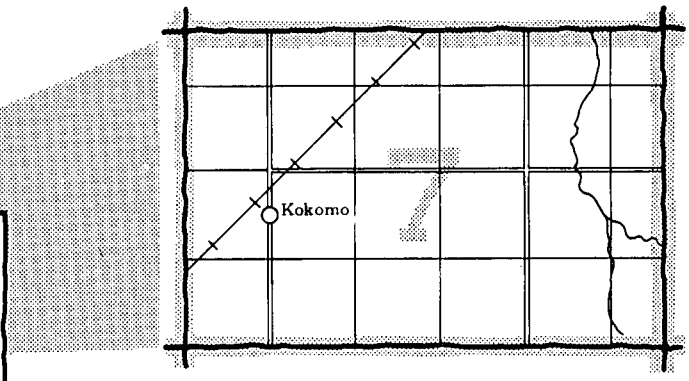
In Cooperation with
University of Georgia
College of Agriculture,
Agricultural Experiment
Stations, and
Tift County

Soil Survey of Tift County Georgia

HOW TO USE

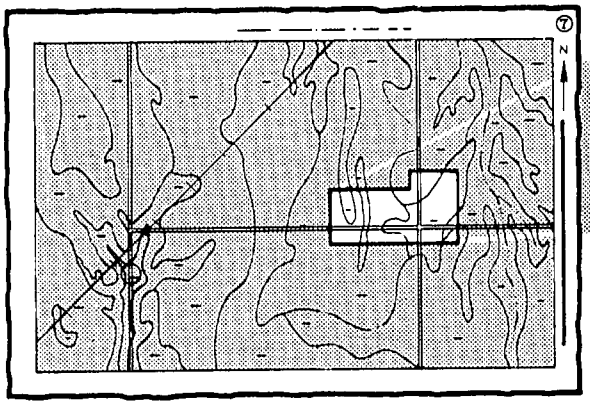
1. Locate your area of interest on the "Index to Map Sheets" (the last page of this publication).

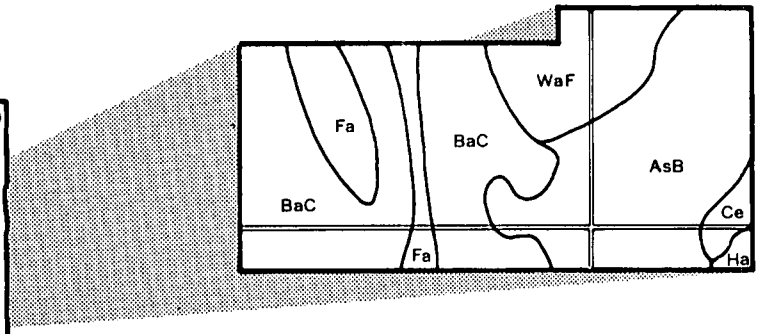




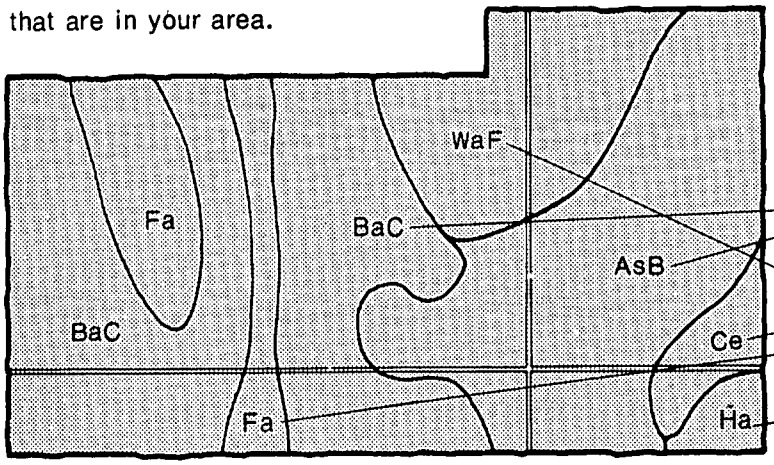
2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.





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



Symbols

AsB
BaC
Ce
Fa
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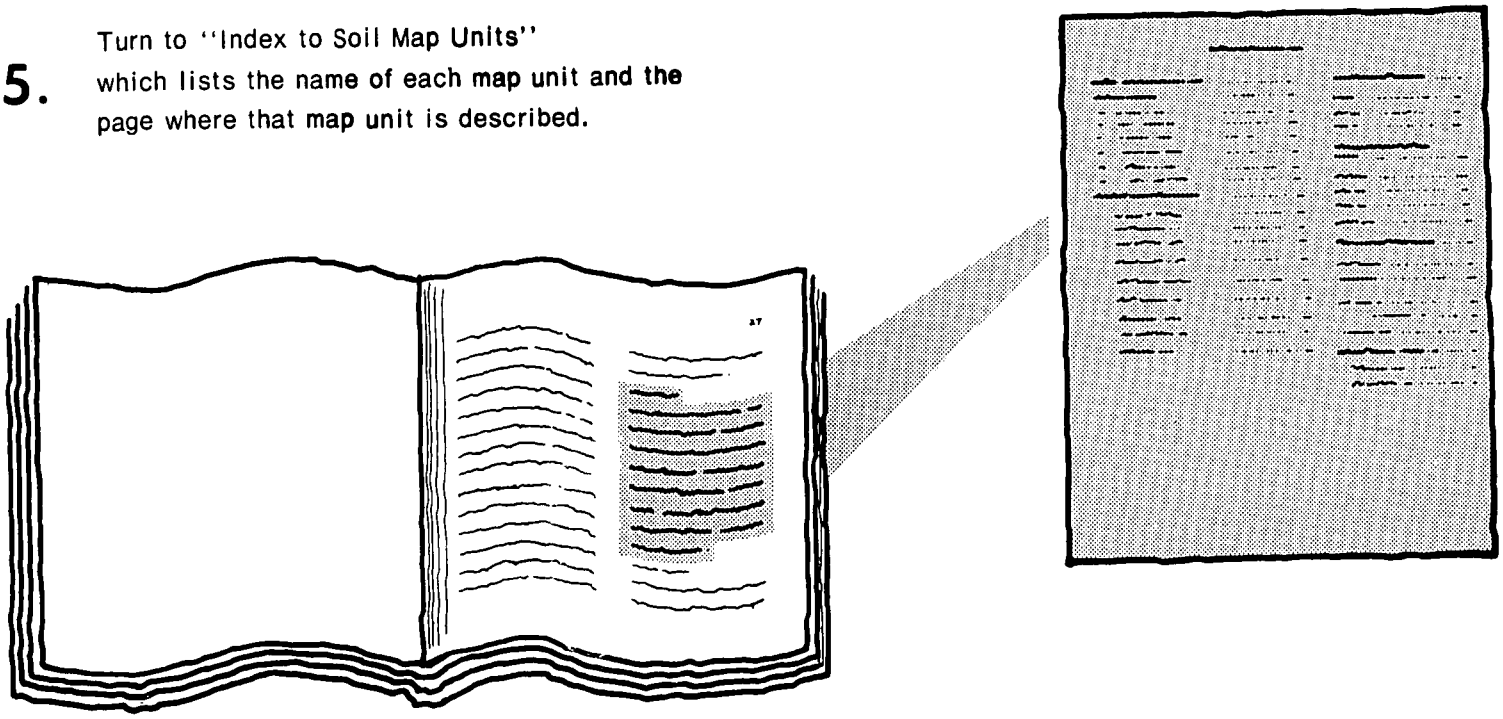
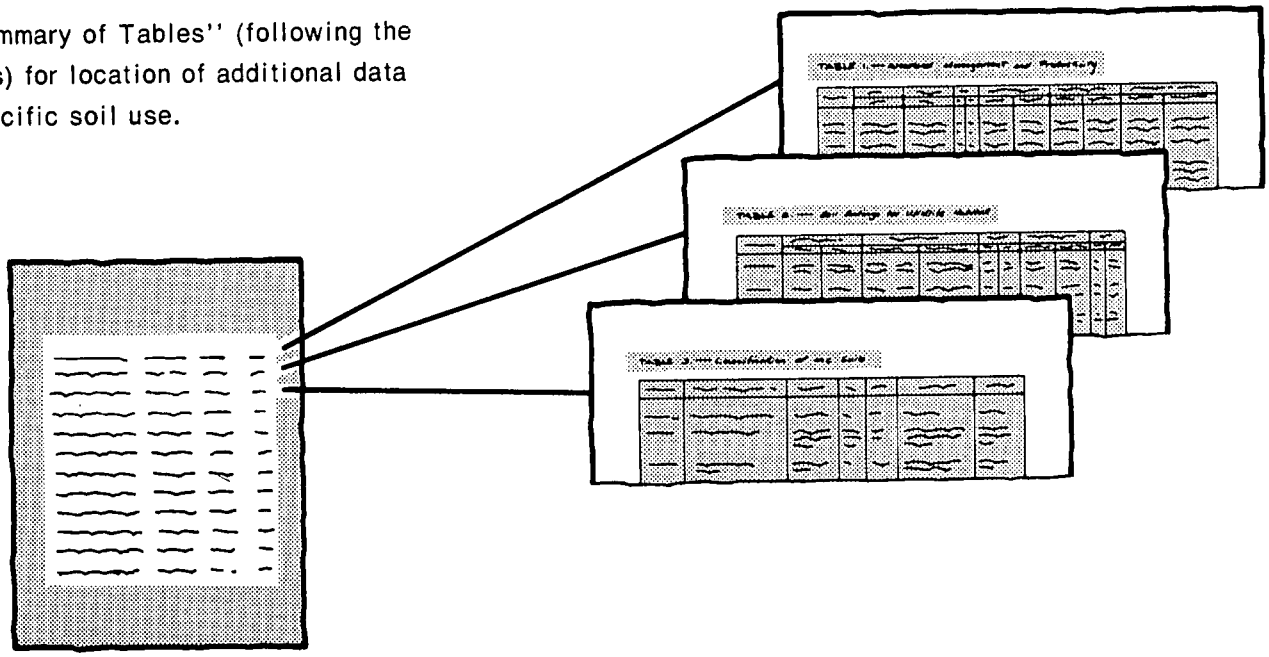
THIS SOIL SURVEY

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



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



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

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

Major fieldwork for this soil survey was performed in the period 1978-79. Soil names and descriptions were approved in 1979. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1979. This survey was made cooperatively by the Soil Conservation Service and the University of Georgia College of Agriculture, Agricultural Experiment Stations, and Tift County. 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 supersedes the surveys of Tift County published in 1912 (*6*) and in 1959 (*8*).

Cover: Irrigating tomato plants on Tifton loamy sand, 0 to 2 percent slopes. In most years, irrigation substantially increases production of the common crops on this deep, well drained upland soil.

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Foreword

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

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

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

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

Dwight M. Treadway

Dwight M. Treadway
State Conservationist
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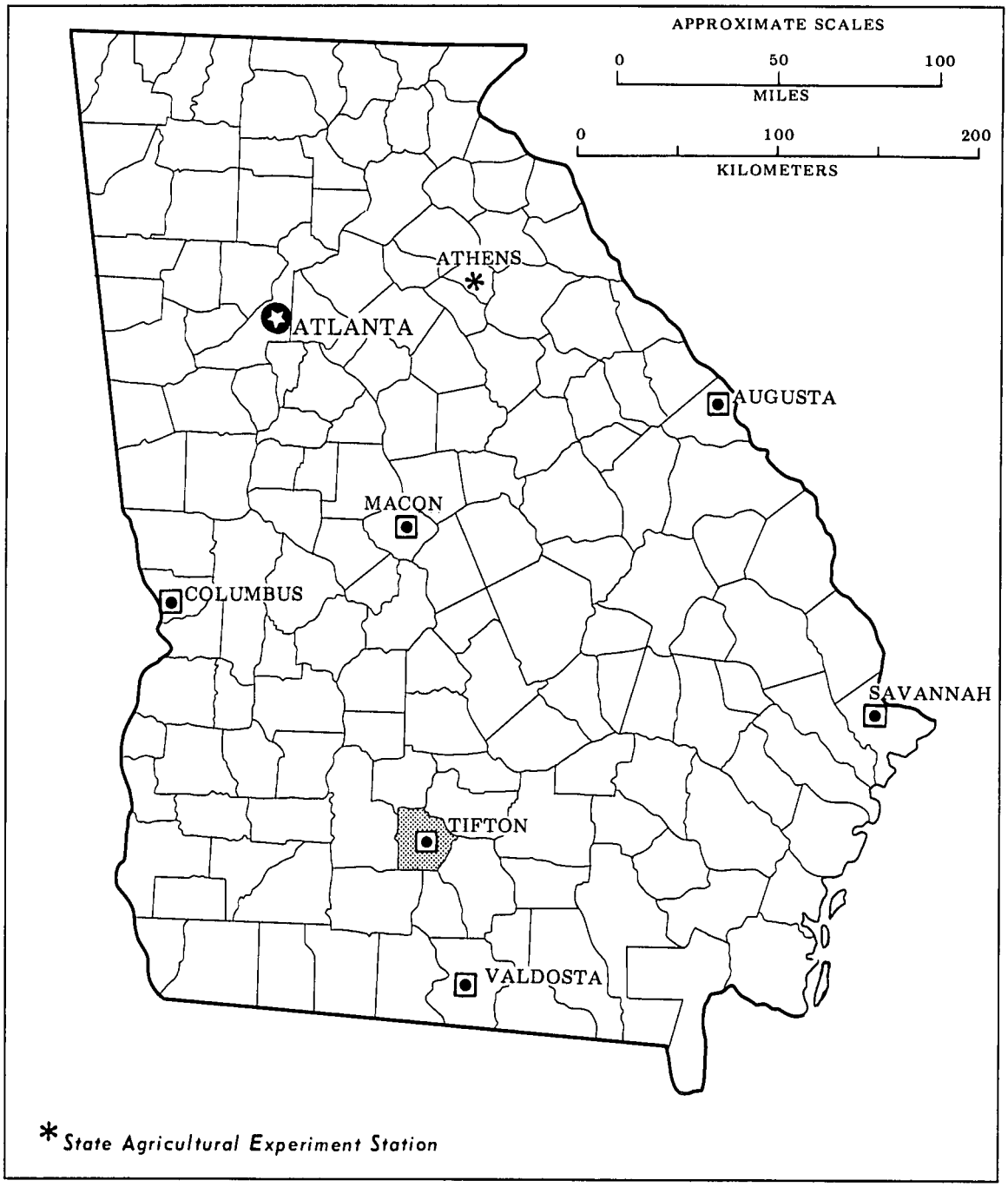


Location of Tift County in Georgia.

soil survey of
Tift County, Georgia

By John W. Calhoun, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service
in cooperation with the
University of Georgia College of Agriculture
Agricultural Experiment Stations, and Tift County.

TIFT COUNTY is in south-central Georgia. It covers an area of 170,240 acres, or 266 square miles. Its population is 32,228. Tifton, the county seat, has a population of about 16,000.

Tift County is in the Southern Coastal Plain Major Land Resource Area. The Alapaha River separates the northeastern part of the county from Benn Hill County. Alapaha, Little, and New Rivers, and Arnold, Gum, Hat, Hardy Mill, Heard, Little, Middle, and Whiddon Mill Creeks and their tributaries are within the county.

The landscape is nearly level to sloping and is dissected by many shallow streams. The steepest slopes, which are on uplands in an area northeast of Tifton and east of Chula, commonly are short and irregular.

Most of the soils are well drained and have a sandy surface layer and a loamy subsoil that is mostly mottled. Nearly level to gently sloping soils are extensive on uplands. Most of these soils are well drained and have smooth, convex slopes. In places, poorly drained soils are in depressions and along drainageways. These soils have a sandy surface layer and a loamy subsoil. Nearly level flood plain soils are common near the rivers and creeks. These soils are poorly drained and mainly loamy throughout.

The elevation ranges from 320 feet at the Cook County line near Little River to 407 feet near the University of Georgia Research Laboratory at a point 3.5 miles north of Tifton. The elevation at Tifton is 350 feet.

General nature of the survey area

This section gives general information concerning the county. It discusses climate, settlement, natural resources, and farming.

Climate

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

Tift County has long, hot summers because moist tropical air from the Gulf of Mexico persistently covers the area. Winters are cool and fairly short, with only a rare cold wave that moderates in 1 or 2 days. Precipitation is fairly heavy throughout the year, and prolonged droughts are rare. Summer rains, mainly afternoon thundershowers, are adequate for all crops.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Tifton in the period 1951 to 1978. 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 50 degrees F, and the average daily minimum temperature is 39 degrees. The lowest temperature on record, which occurred at Tifton on January 30, 1966, is 6 degrees. In summer the average temperature is 80 degrees, and the average daily maximum temperature is 90 degrees. The

highest recorded temperature, which occurred on June 28, 1977, 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.

Of the total annual precipitation, 26 inches, or 55 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 21 inches. The heaviest 1-day rainfall during the period of record was 4.2 inches at Tifton on September 25, 1956. Thunderstorms occur on about 70 days each year, and most occur in summer.

Snowfall is rare. In 95 percent of the winters, there is no measurable snowfall. In 5 percent, the snowfall, usually of short duration, is more than 1 inch. The heaviest 1-day snowfall on record was more than 1 inch.

The average relative humidity in midafternoon is about 90 percent. Humidity is higher at night, and the average at dawn is about 65 percent. The sun shines 70 percent of the time possible in summer and 55 percent in winter. The prevailing wind is from the northwest. Average windspeed is highest, 9 miles per hour, in spring.

Severe local storms, including tornadoes, strike occasionally in or near the survey area. They are short and cause variable and spotty damage. Every few years in summer or autumn, a tropical depression or remnant of a hurricane which has moved inland causes extremely heavy rains for 1 to 3 days.

Settlement

Tift County was originally occupied by Creek and Cherokee Indians. The first settlers on record came mainly from Virginia, Maryland, the Carolinas, and the older settlements in Georgia. Later, several farmers from northern states settled in the county.

The Atlantic Coastline Railroad and the Georgia Southern and Florida Railroad helped in the early development of the county. In 1872, most of the area was in pine trees and sawmills, and turpentine plants were the dominant industries. Tifton, founded by Henry Harding Tift in 1872, was a log station near the Atlantic Coastline Railroad. After the trees were harvested, the land was cleared for crops.

Tift County was established by the General Assembly of Georgia on August 17, 1905. It was formed from parts of Berrien County and Irwin County to the east and Worth County to the west. The county was named for Nelson Tift, businessman and politician. In 1905, the population of the county was 13,500. In 1909 the population of Tifton, the county seat, was 4,500.

Tift County today is mainly agricultural. The Georgia Coastal Plain Experiment Station, established at Tifton in 1918, contributes to the improvement of farming methods in Tift County and throughout the Southern Coastal Plain. Farm equipment, pulpwood, textiles, lumber, concrete products, sheet metal, processed meat, and chemicals are produced in the county.

The county has many ground transportation routes to local and out-of-state markets. Air transportation is also available. Railroads and truck lines provide freight service to and from Tifton, where produce and livestock are marketed.

Water resources

Deep wells drilled into the Ocala Limestone aquifer produce abundant water for domestic use and for irrigation. These wells generally range from 230 to 500 feet in depth. Wells in the vicinity of Brookfield and those somewhat west of Omega range from 500 to 700 feet in depth. Commonly, the supply of water in these wells is insufficient for normal use. Many farm ponds are used for watering livestock and for irrigation and recreation. The Alapaha, Little, and New Rivers and Ty Ty, Arnold, Hat, Middle, and Little Creeks also provide water.

Farming

Agricultural development in Tift County was slow before 1888. Lumber and naval stores provided prosperity for the early settlers. After the land was cleared, cotton was the main cash crop and corn the main feed crop. Native wiregrass provided forage for livestock. The areas producing crops were fenced. The Atlantic Coastline Railroad and the Georgia Southern and Florida Railroad, which opened in 1888, attracted farmers to Tift County and stimulated agricultural development.

Early in the 1900's, cotton and corn were the principal crops. Cotton was grown on about half of the cultivated land. Cowpeas, velvet beans, sweet potatoes, sugarcane, and vegetable crops such as beans, peas, tomatoes, and irish potatoes were also grown. Oats, rye, and wheat were the chief forage crops. Cantaloupes, pecans, peaches, pears, plums, figs, and watermelon were important fruit crops. Many carloads of cantaloupes and watermelons were shipped to northern markets.

Improved crop varieties, seed selection, and improved cultivation methods were important factors in early agricultural development. Cotton grew best on Tifton loamy sand and Dothan loamy sand. The census of 1910 indicates that large amounts of commercial fertilizer were used to increase crop yields.

Hog production was the most important livestock enterprise. Cattle, sheep, and goats also were important. Most farm families had a milch cow to supply milk and butter.

By 1929 nearly 20,000 acres of cotton and 24,000 acres of corn were grown. Since that time, the acreage of cotton has steadily declined and the acreage of corn

has slightly increased. After 1929, peanuts, tobacco, and pecans became important; by the early 1970's, soybeans were being grown extensively.

The economic depression in the early 1930's led to misuse of the land. This misuse increased erosion on most sloping soils. Many fields were abandoned because of low crop yields. Changes in land ownership were common, and soil fertility was not maintained in most places. There was 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 Tift County. The Middle South Georgia Soil and Water Conservation District was organized in 1939, and Tift County was one of the nine counties included in the District. Farmers in Tift County recognized the need for soil conservation to prevent soil erosion and improve or maintain 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, seriously eroded fields that had been cultivated were put in 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 Tift County available for producing food, feed, forage, fiber, and oilseed crops is identified in the section "Important farmland."

In 1969, farms covered 134,329 acres, or 78.9 percent of Tift County. This county produces significant amounts of high-yielding peanuts, corn, soybeans, tobacco, pecans, truck crops, and vegetable plants. The acreage of improved bermudagrass and bahiagrass is increasing.

With greater use of farm machinery and improved tillage methods, the average size of farms has increased and the number of farms and the number of farm workers needed have decreased. In 1964, Tift County had 694 farms averaging 205 acres. By 1969, the number of farms had decreased to 613 and the average size had increased to 219 acres.

The sale of crops, including nursery products and hay, produces about 72 percent of the total farm income in the county. Sales from livestock and poultry and their products amount to 25 percent of the farm income. There are four livestock markets. Forest products are also important.

Many of the soils are well suited to sprinkler irrigation. The amount of land under irrigation increased from 6,543 acres in 1964 to 9,882 acres in 1969. Most of the irrigated land is used for vegetable plants, truck crops, tobacco, peanuts, and corn. By 1979, there were about 120 irrigation systems covering nearly 15,000 acres.

About 69,000 acres in the county is limited for agriculture because of wetness. Of that, however, about 15,000 acres was artificially drained by 1969.

How this survey was made

Soil scientists made this survey to learn what soils are in the survey area, where they are, and how they can be used. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; and the kinds of rock. They dug many holes to study soil profiles. A profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the parent material, which has been changed very little by leaching or by plant roots.

The soil scientists recorded the characteristics of the profiles they studied and compared those profiles with others in nearby counties and in more distant places. They classified and named the soils according to nationwide uniform procedures. They drew the boundaries of the soils on aerial photographs. These photographs show trees, buildings, fields, roads, and other details that help in drawing boundaries accurately. The soil maps at the back of this publication were prepared from aerial photographs.

The areas shown on a soil map are called map units. Most map units are made up of one kind of soil. Some are made up of two or more kinds. The map units in this survey area are described under "General soil map units" and "Detailed soil map units."

While a soil survey is in progress, samples of some soils are taken for laboratory measurements and for engineering tests. All soils are field tested to determine their characteristics. Interpretations of those characteristics may be modified during the survey. Data are assembled from other sources, such as test results, records, field experience, and state and local specialists. For example, data on crop yields under defined management are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it can be used by farmers, woodland managers, engineers, planners, developers and builders, home buyers, and others.

General soil map units

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

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

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

The soils in the survey area differ in suitability for major land uses. This section gives the major land uses for each map unit, the main concerns of management, and the soil properties that limit use. Cultivated farm crops are mainly corn, soybeans, and peanuts; some cotton is also grown. Pasture crops are mainly improved bermudagrass and bahiagrass. Woodland produces either native trees or introduced species. Nonfarm uses include residential, commercial, and industrial developments and campsites, picnic areas, ballfields, and other areas used for intensive recreation.

Soil descriptions

Nearly level soils on flood plains

These soils have slope of 0 to 2 percent and are poorly drained. They have a grayish loamy surface layer and grayish, mottled loamy or sandy underlying layers.

1. Kinston-Osier

Poorly drained soils that are loamy or dominantly sandy throughout

This map unit consists of nearly level soils on long, narrow flood plains. Slope is 0 to 2 percent . Areas are primarily adjacent to the Alapaha River, Little River, New River, Ty Ty Creek, Hat Creek, Wheddons Creek, and Arnold Creek.

This map unit makes up about 7 percent of Tift County. Kinston soils make up about 50 percent of the unit; Osier soils, about 21 percent; and minor soils, about 29 percent.

Kinston soils are loamy throughout. Typically, they have a surface layer of dark gray fine sandy loam about 6 inches thick. The subsoil is mainly sandy clay loam and extends to a depth of 60 inches or more. It is gray and has yellow and brown mottles.

Osier soils are dominantly sandy throughout. Typically, they have a surface layer of dark gray fine sandy loam about 6 inches thick. The underlying layers, to a depth of 65 inches or more, are grayish sand or loamy coarse sand that has yellow and brown mottles.

Of minor extent in this map unit are Ocilla and Rains soils. Ocilla soils are somewhat poorly drained and are on stream terraces. Rains soils are poorly drained and are in smooth areas and in slight depressions on terraces.

The soils in this map unit are used mainly as woodland. Sweetgum, blackgum, and water oak are the dominant trees, but slash pine and loblolly pine are grown in a few places. A few areas are in pasture. Beef cattle and hogs are the main kinds of livestock. The main concerns in management are wetness and flooding. The hazard of flooding and the seasonal high water table severely limit most nonfarm uses.

Nearly level soils on uplands and stream terraces

These soils are moderately well drained to poorly drained. The somewhat poorly drained soils are on low lying uplands and on stream terraces; the moderately well drained soils are on low lying uplands; and the poorly drained soils are on uplands that are broad and smooth, in depressions, or along drainageways. Slope is 0 to 2 percent. The somewhat poorly drained soils have a thick, grayish sandy surface layer and subsurface layer and a yellowish or brownish loamy subsoil that are mottled. The moderately well drained soils have a thick, brownish sandy surface and subsurface layer and a yellowish loamy subsoil that is mottled. The poorly drained soils have a thick, grayish sandy surface and subsurface layer and a grayish loamy subsoil that is mottled.

2. Ocilla-Stilson-Pelham

Moderately well drained to poorly drained soils that have a thick sandy surface and subsurface layer and a loamy subsoil

This map unit consists of nearly level soils in low lying areas on uplands, in depressions or along drainageways on uplands, or on stream terraces. The low lying areas commonly are somewhat higher on the landscape than the stream terraces, depressions, and drainageways. Many intermittent ponds, one acre to four acres in size, are throughout the unit. Slope is 0 to 2 percent.

This map unit makes up about 6 percent of Tift County. Ocilla soils make up about 45 percent of this unit; Stilson soils, about 25 percent; Pelham soils, about 20 percent; and minor soils, about 10 percent.

Ocilla soils are in the low lying areas on uplands and on stream terraces. These somewhat poorly drained soils have a sandy surface layer, a thick sandy subsurface layer, and a loamy subsoil. Typically, the surface layer is very dark gray loamy sand about 6 inches thick. The subsurface layer is loamy sand and extends to a depth of 32 inches. The upper part of that layer is light brownish gray, and the lower part is pale brown and has light yellowish brown and light gray mottles. The subsoil dominantly is sandy clay loam and extends to a depth of 80 inches or more. The upper part of the subsoil is brownish yellow and has light gray and yellowish brown mottles; the middle part is brownish yellow and has light gray, yellowish brown, and yellowish red mottles; and the lower part is mottled light yellowish brown, light gray, yellowish brown, strong brown, and brown.

Stilson soils are in low lying areas on uplands. These moderately well drained soils have a sandy surface layer, a thick sandy subsurface layer, and a loamy subsoil. Typically, the surface layer is dark grayish brown loamy sand about 6 inches thick. The subsurface layer is light yellowish brown loamy sand and extends to a depth of 25 inches. The subsoil extends to a depth of 65 inches or more. The upper few inches of the subsoil is light yellowish brown sandy loam, and the rest is dominantly brownish yellow sandy clay loam that has light gray, light brownish gray, yellowish brown, yellowish red, and strong brown mottles. Plinthite is below a depth of about 38 inches and makes up about 8 percent of the lower part of the subsoil.

Pelham soils are in depressions and along drainageways on uplands. These poorly drained soils have a sandy surface layer, a thick sandy subsurface layer, and a loamy subsoil. Typically, the surface layer is dark gray loamy sand about 5 inches thick. The subsurface layer is gray loamy sand and extends to a depth of 26 inches. The subsoil is dominantly sandy clay loam and extends to a depth of 80 inches or more. It is light gray throughout and has light yellowish brown, brownish yellow, strong brown, and yellowish red mottles.

Of minor extent in this map unit are Albany, Clarendon, Fuquay, Lakeland, Mascotte, and Olustee soils. The somewhat poorly drained Albany soils are in smooth low lying areas. The moderately well drained Clarendon soils are in higher lying areas near natural ponds and drainageways. The well drained Fuquay soils and excessively drained Lakeland soils are on broad ridgetops. Poorly drained Olustee and Mascotte soils are in smooth low lying areas.

The soils in this map unit are used mainly for forest products and pasture. Corn, tobacco, peanuts, and soybeans are grown in some areas. Beef cattle and hogs are the main kinds of livestock. Most streams in this unit are not free flowing. The main concern in management is overcoming wetness. The wetness severely limits the soils for most nonfarm uses.

Dominantly nearly level and very gently sloping soils on uplands

This group consists of excessively drained soils on broad ridgetops and poorly drained soils in broad smooth areas, in depressions, and along drainageways. Slope is dominantly 0 to 5 percent. The excessively drained soils are brownish and sandy throughout. The poorly drained soils have a thick, grayish sandy surface layer and a grayish loamy subsoil that is mottled.

3. Lakeland-Pelham

Excessively drained soils that are sandy throughout, mainly on ridgetops; and poorly drained soils that have a thick sandy surface layer and a loamy subsoil, in depressions and along drainageways

This map unit consists of dominantly nearly level and very gently sloping soils mainly on broad ridgetops and nearly level soils along narrow drainageways and in depressions. A few shallow ponds are in the unit. Slope commonly is 0 to 5 percent. Most of this unit is near the flood plain of Little River.

This map unit makes up about 2 percent of Tift County. Lakeland soils make up about 50 percent of this unit; Pelham soils, about 25 percent; and minor soils, about 25 percent.

Lakeland soils are mainly on ridgetops. These excessively drained soils are sandy throughout. Typically, the surface layer is dark grayish brown sand about 4 inches thick. The underlying layers, to a depth of 85 inches or more, are sand. These layers are yellowish brown, and the lower layer also has very pale brown mottles.

Pelham soils are in depressions and along drainageways. These poorly drained soils have a sandy surface layer, a thick sandy subsurface layer, and a loamy subsoil. Typically, the surface layer is dark gray loamy sand about 5 inches thick. The subsurface layer is gray loamy sand and extends to a depth of 26 inches. The subsoil is dominantly sandy clay loam and extends to a depth of 80 inches or more. It is light gray throughout and has light yellowish brown, brownish yellow, strong brown, and yellowish red mottles.

Of minor extent in this map unit are Albany, Fuquay, Grady, and Kershaw soils. The well drained Fuquay soils and the excessively drained Kershaw soils are on

ridgetops or hillsides. The somewhat poorly drained Albany soils are in smooth low lying areas. The poorly drained Grady soils are in depressions.

The soils in this unit are used mainly for the production of wood crops. Corn, peanuts, and soybeans are grown in a few places. A few areas are used for pasture. Beef cattle and hogs are the main kinds of livestock. The main concern in management is low available water capacity. Wetness severely limits Pelham soil for most nonfarm uses.

Nearly level to gently sloping soils on uplands

The soils in this group are well drained or poorly drained. The well drained soils are on ridgetops or hillsides; the poorly drained soils are in depressions and along drainageways. Slope is 0 to 8 percent. The well drained soils have a brownish sandy surface layer and a brownish loamy subsoil that is mottled in the lower part. The poorly drained soils have a thick, grayish sandy surface layer and a grayish loamy subsoil that is mottled.

4. Tifton-Alapaha-Fuquay

Well drained soils that have a sandy surface layer or a thick sandy surface and subsurface layer and a loamy subsoil, mainly on ridgetops; and poorly drained soils that have a thick sandy surface layer and a loamy subsoil, in depressions and along drainageways

This map unit consists of well drained soils mainly on smooth and convex ridgetops and seasonally wet soils in depressions and along drainageways. Slope is 0 to 8 percent.

This map unit makes up about 6 percent of Tift County. Tifton soils make up about 37 percent of the unit; Alapaha soils, about 14 percent; Fuquay soils, about 10 percent; and minor soils, about 39 percent.

Tifton soils are mainly on ridgetops. These well drained soils have mainly a sandy surface layer and a loamy susoil. Typically, the surface layer is dark grayish brown loamy sand about 10 inches thick. The subsoil is dominantly sandy clay loam and extends to a depth of 72 inches or more. The upper part of the subsoil is yellowish brown, and the lower part is mottled yellowish brown, red, olive yellow, and light gray. Plinthite makes up 10 to 15 percent of the lower part of the subsoil, below a depth of 39 inches. Many nodules of ironstone are on the surface and in the upper part of the profile.

Alapaha soils are in depressions and along drainageways. These poorly drained soils have a sandy surface layer, a thick sandy subsurface layer, and a loamy subsoil. Typically, the surface layer is very dark gray loamy sand about 6 inches thick. The subsurface layer is loamy sand and extends to a depth of 30 inches. It is dark gray in the upper part and gray in the lower part. The subsoil is sandy clay loam and extends to a depth of 80 inches or more. The upper few inches of the subsoil is gray and has brownish yellow and strong brown mottles, and the rest of the subsoil is mottled yellowish brown, red, light gray, and strong brown. Plinthite is below a depth of about 42 inches.

Fuquay soils are on ridgetops. These well drained soils have a sandy surface layer, a thick sandy subsurface layer, and a loamy subsoil. Typically, the surface layer is dark grayish brown loamy sand about 10 inches thick. The subsurface layer is light yellowish brown loamy sand and extends to a depth of 32 inches. The subsoil is mainly sandy clay loam and extends to a depth of more than 80 inches. The upper part of the subsoil is yellowish brown; the middle part is yellowish brown and has red and light gray mottles; and the lower part is mottled brownish yellow, red, light gray, and yellowish red. Plinthite makes up 8 percent of the lower part of the subsoil, below a depth of about 46 inches. A few nodules of ironstone are throughout the upper 46 inches of the soil.

Of minor extent in this map unit are Clarendon, Dothan, Leefield, and Stilson soils. The well drained Dothan soils are on ridgetops and hillsides. The moderately well drained Clarendon and Stilson soils and the somewhat poorly drained Leefield soils are somewhat higher on the landscape than the soils in drainageways.

The soils in this map unit are used mainly for corn, peanuts, cotton, soybeans, tobacco, pecans, and truck crops. Forest products and pasture are also important. Hogs and beef cattle are the main kinds of livestock. The main concerns of management are controlling erosion on Tifton soils and increasing the available water capacity of the Fuquay soils. Wetness, the main limitation of Alapaha soils, severely limits most nonfarm uses.

5. Tifton-Alapaha-Dothan

Well drained soils that have a dominantly sandy surface layer and a loamy subsoil, mainly on ridgetops; and poorly drained soils that have a thick sandy surface layer and a loamy subsoil, in depressions and along drainageways

This map unit consists of soils mainly on smooth and convex ridgetops and seasonally wet soils in depressions and along drainageways. Slope is 0 to 5 percent.

This map unit makes up about 51 percent of Tift County. Tifton soils make up about 39 percent of the unit; Alpaha soils, about 20 percent; Dothan soils, about 8 percent; and minor soils, about 33 percent.

Tifton soils are mainly on ridgetops. These well drained soils have mainly a sandy surface layer and a loamy subsoil. Typically, the surface layer is dark grayish brown loamy sand about 10 inches thick. The subsoil is dominantly sandy clay loam and extends to a depth of 72 inches or more. The upper part of the subsoil is yellowish brown, and the lower part is mottled yellowish brown, red, olive yellow, and light gray. Plinthite makes up 10 to 15 percent of the lower part of the subsoil,

below a depth of 39 inches. Many nodules of ironstone are on the surface and in the upper part of the profile.

Alapaha soils are in depressions and along drainageways. These poorly drained soils have a sandy surface layer, a thick sandy subsurface layer, and a loamy subsoil. Typically, the surface layer is very dark gray loamy sand about 6 inches thick. The subsurface layer is loamy sand and extends to a depth of 30 inches. It is dark gray in the upper part and gray in the lower part. The subsoil is sandy clay loam and extends to a depth of 80 inches or more. The upper few inches of the subsoil is gray and has brownish yellow and strong brown mottles, and the rest of the subsoil is mottled yellowish brown, red, light gray, and strong brown. Plinthite is below a depth of about 42 inches.

Dothan soils are on ridgetops. These well drained soils have a sandy surface layer and a loamy subsoil. Typically, the surface layer is dark grayish brown loamy sand about 9 inches thick. The subsoil is dominantly sandy clay loam and extends to a depth of 74 inches or more. The upper part of the subsoil is yellowish brown; the middle part is yellowish brown and has red, very pale brown, and strong brown mottles; and the lower part is mottled yellowish brown, white, red, and strong brown. Plinthite makes up 5 to 10 percent of the lower part of the subsoil, below a depth of 37 inches. Nodules of ironstone are in the surface layer and the upper part of the subsoil.

Of minor extent in this map unit are Ardilla, Carnegie, Clarendon, Fuquay, Grady, Leefield, and Stilson soils. The well drained Carnegie and Fuquay soils are on ridgetops or hillsides. The moderately well drained Clarendon and Stilson soils and the somewhat poorly drained Ardilla and Leefield soils are somewhat higher on the landscape than the soils in drainageways. The poorly drained Grady soils are in depressions.

The soils in this map unit are used mainly for corn, peanuts, cotton, soybeans, pecans, tobacco, and truck crops. Pasture and forest products are also important. Beef cattle and hogs are the main kinds of livestock. The main concerns of management are controlling erosion in areas of the Tifton and Dothan soils and overcoming wetness in areas of the Alapaha soils. The wetness of the Alapaha soils severely limits most nonfarm uses.

6. Tifton-Alapaha

Well drained soils that have a dominantly sandy surface layer and a loamy subsoil, on smooth ridgetops and irregular hillsides; and poorly drained soils that have a thick sandy surface layer and a loamy subsoil, in depressions and along drainageways

This map unit consists of soils on smooth and convex ridgetops, eroded soils on irregular hillsides, and seasonally wet soils in depressions and along drainageways. Slope is 0 to 8 percent.

This map unit makes up about 20 percent of Tift County. Tifton soils make up about 50 percent of the unit; Alapaha soils, about 18 percent; and minor soils about 32 percent.

Tifton soils are on ridgetops and hillsides. These well drained soils have a sandy surface layer and a loamy subsoil. Typically, the surface layer is dark grayish brown loamy sand about 10 inches thick. The subsoil is dominantly sandy clay loam and extends to a depth of 72 inches or more. The upper part of the subsoil is yellowish brown, and the lower part is mottled yellowish brown, red, olive yellow, and light gray. Plinthite makes up 10 to 15 percent of the lower part of the subsoil, below a depth of 39 inches. Many nodules of ironstone are on the surface and in the upper part of the profile.

Alapaha soils are in depressions and along drainageways. These poorly drained soils have a sandy surface layer, a thick sandy subsurface layer, and a loamy subsoil. Typically, the surface layer is very dark gray loamy sand about 6 inches thick. The subsurface layer is loamy sand and extends to a depth of 30 inches. It is dark gray in the upper part and gray in the lower part. The subsoil is sandy clay loam and extends to a depth of 80 inches or more. The upper few inches of the subsoil is gray and has brownish yellow and strong brown mottles, and the rest of the subsoil is mottled yellowish brown, red, light gray, and strong brown. Plinthite is below a depth of about 42 inches.

Of minor extent in this map unit are Carnegie, Cowarts, Clarendon, Dothan, Leefield, and Stilson soils. The well drained Carnegie, Cowart, and Dothan soils are on ridgetops or hillsides. The moderately well drained Clarendon and Stilson soils and the somewhat poorly drained Leefield soils are somewhat higher on the landscape than the soils in drainageways.

The soils in this map unit are used mainly for corn, peanuts, cotton, soybeans, pecans, tobacco, and truck crops. Pasture and forest products are also important. Beef cattle and hogs are the main kinds of livestock. The main concerns of management are controlling erosion in areas of the Tifton soils and overcoming wetness in areas of the Alapaha soils. The wetness of the Alapaha soils severely limits most nonfarm uses.

Dominantly very gently sloping and gently sloping soils on uplands

The soils in this group are well drained or poorly drained. The well drained soils are on ridgetops or hillsides; the poorly drained soils are in depressions and along drainageways. Slope dominantly is 2 to 8 percent but ranges from 0 to 8 percent. The well drained soils have a brownish sandy or loamy surface layer and a brownish loamy subsoil that is mottled in the lower part. The poorly drained soils have a thick, grayish sandy surface layer and grayish loamy subsoil that is mottled.

7. Tifton-Alapaha-Cowarts

Well drained soils that have a dominantly sandy surface layer and a loamy subsoil, on ridgetops and irregular

hillsides; and poorly drained soils that have a thick sandy surface layer and a loamy subsoil, mainly along drainageways

This map unit consists of soils on smooth and convex ridgetops, eroded soils on irregular hillsides, and seasonally wet soils in depressions and along drainageways. Slope dominantly is 2 to 8 percent but ranges from 0 to 8 percent.

This map unit makes up about 3 percent of Tift County. Tifton soils make up about 40 percent of this unit; Alapaha soils, about 15 percent; Cowarts soils, about 6 percent; and minor soils, about 39 percent.

Tifton soils are on ridgetops and hillsides. These well drained soils have mainly a sandy surface layer and a loamy subsoil. Typically, the surface layer is dark grayish brown loamy sand about 10 inches thick. The subsoil is dominantly sandy clay loam that extends to a depth of 72 inches or more. The upper part of the subsoil is yellowish brown, and the lower part is mottled yellowish brown, red, olive yellow, and light gray. Plinthite makes up 10 to 15 percent of the lower part of the subsoil, below a depth of 39 inches. Many nodules of ironstone are on the surface and in the upper part of the profile.

Alapaha soils are in depressions and along drainageways. These poorly drained soils have a sandy surface layer, a thick sandy subsurface layer, and a loamy subsoil. Typically, the surface layer is very dark gray loamy sand about 6 inches thick. The subsurface layer is loamy sand and extends to a depth of 30 inches. It is dark gray in the upper part and gray in the lower part. The subsoil is sandy clay loam and extends to a depth of 80 inches or more. The upper few inches of the subsoil is gray and has brownish yellow and strong brown mottles, and the rest of the subsoil is mottled yellowish brown, red, light gray, and strong brown. Plinthite is below a depth of about 42 inches.

Cowarts soils are on ridgetops and hillsides. These well drained soils commonly are loamy throughout. Typically, the surface layer is dark grayish brown sandy loam about 5 inches thick. The subsoil is sandy clay loam and extends to a depth of 26 inches. It is yellowish brown throughout and has red and yellowish red mottles in the lower part. The substratum, to a depth of 62 inches or more, is mottled and streaked yellowish brown, light gray, red, and strong brown sandy clay loam that has pockets of sandy loam.

Of minor extent in this map unit are Carnegie, Clarendon, Dothan, Esto, Fuquay, Susquehanna, and Sunsweet soils. The well drained Carnegie, Dothan, Esto, Fuquay, and Sunsweet soils and the somewhat poorly drained Susquehanna soils are on ridgetops or hillsides. The moderately well drained Clarendon soils are on low lying uplands near natural ponds and drainageways.

Much of the acreage of this map unit is used for pasture and forest products. Some acreage is used for corn, peanuts, soybeans, and tobacco. Beef cattle and hogs are the main kinds of livestock. The main concerns in management are controlling erosion in areas of Tifton and Cowarts soils and overcoming wetness in areas of Alapaha soils. The wetness of the Alapaha soils severely limits most nonfarm uses.

8. Cowarts-Alapaha-Fuquay

Well drained soils that are loamy throughout and poorly drained and well drained soils that have a thick sandy surface and subsurface layer and a loamy subsoil

This map unit consists of soils on smooth and convex ridgetops, eroded soils on irregular hillsides, and seasonally wet soils in depressions and along drainageways. Slope dominantly is 2 to 8 percent but ranges from 0 to 8 percent.

This map unit makes up about 5 percent of Tift County. Cowarts soils make up about 45 percent of this unit; Alapaha soils, about 18 percent; Fuquay soils, about 11 percent; and minor soils, about 26 percent.

Cowarts soils are on ridgetops and hillsides. These well drained soils commonly are loamy throughout. Typically, the surface layer is dark grayish brown sandy loam about 5 inches thick. The subsoil is sandy clay loam and extends to a depth of 26 inches. It is yellowish brown throughout and has red and yellowish red mottles. The substratum, to a depth of 62 inches or more, is mottled and streaked yellowish brown, light gray, red, and strong brown sandy clay loam that has pockets of sandy loam.

Alapaha soils are in depressions and along drainageways. These poorly drained soils have a sandy surface layer, a thick sandy subsurface layer, and a loamy subsoil. Typically, the surface layer is very dark gray loamy sand about 6 inches thick. The subsurface layer is loamy sand and extends to a depth of 30 inches. It is dark gray in the upper part and gray in the lower part. The subsoil is sandy clay loam and extends to a depth of 80 inches or more. The upper few inches of the subsoil is gray and has brownish yellow and strong brown mottles, and the rest of the subsoil is mottled yellowish brown, red, light gray, and strong brown. Plinthite is below a depth of about 42 inches.

Fuquay soils are on ridgetops. These well drained soils have a sandy surface layer, a thick sandy subsurface layer, and a loamy subsoil. Typically, the surface layer is dark grayish brown loamy sandy about 10 inches thick. The subsurface layer is light yellowish brown loamy sand and extends to a depth of 32 inches. The subsoil is mainly sandy clay loam and extends to a depth of more than 80 inches. The upper part of the subsoil is yellowish brown; the middle part is yellowish brown and has red and light gray mottles; and the lower part is mottled brownish yellow, red, light gray, and yellowish red. Plinthite makes up 8 percent of the lower part of the subsoil, below a depth of about 46 inches. A few nodules of ironstone are throughout the upper 46 inches of the profile.

Of minor extent in this map unit are Carnegie, Dothan, Esto, Lakeland, Stilson, and Susquehanna soils. The excessively drained Lakeland soils, the well drained Carnegie, Dothan, and Esto soils, and the somewhat poorly drained Susquehanna soils are on ridgetops and hillsides. The moderately well drained Stilson soils are somewhat higher on the landscape than the soils in drainageways.

Much of the acreage of this map unit is used for pasture and forest products. A small acreage is used for corn, peanuts, and soybeans. Beef cattle and hogs are the main kinds of livestock. The main concerns in management are controlling erosion on the Cowarts soils and increasing the available water capacity of the Fuquay soils. Wetness, the main limitation of Alapaha soils, severely limits most nonfarm uses.

Broad land use considerations

Deciding which land should be used for urban development is a concern in the survey area. Each year more land is converted to urban uses. The general soil map is most helpful in planning the general outline of urban areas, but it cannot be used in selecting sites for specific structures or facilities.

Areas of soils that are unfavorable for urban and recreation development are not extensive in the survey area. In areas of the Kinston-Osier map unit, on flood plains, the flooding and wetness severely limit urban uses. The soils of the Ocilla-Stilson-Pelham map unit, which are on low-lying uplands, on terraces, and along drainageways, are seasonally wet and therefore are severely limited for urban uses. In areas of the Lakeland-Pelham map unit the sandy, excessively drained Lakeland soils are limited for urban uses by the hazard of seepage; and the poorly drained Pelham soils are severely limited for these uses by wetness.

The other map units have soils that can be developed for urban and recreation uses at lower cost. These soils have a loamy subsoil and are well drained. Their excellence as farmland should not be overlooked in planning. In general, the soils that are well suited to farming are also well suited to urban development.

Most of the soils in Tift county are well suited to woodland. Trees do not grow as well on the excessively drained sandy soils in the Lakeland-Pelham map unit as they do on the soils that can supply more water to the trees.

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 of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and management of the soils."

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

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

The soils are rated as well suited, moderately suited, or poorly suited for specific uses. *Well suited* means that the soil properties are favorable for the use. *Moderately suited* means that the soil properties necessitate special planning and management for the use. *Poorly suited* means that the soil properties are unfavorable for the use.

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

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, 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 or of one or more soils and a miscellaneous area (an area that has little or no soil material and supports little or no vegetation). These map units are called soil complexes or undifferentiated groups.

The soils making up a *complex*, and the miscellaneous area if included, occur in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils and miscellaneous area are somewhat similar in all areas. Tifton-Urban land complex, 0 to 5 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in a mapped area are not uniform. Kinston and Osier fine sandy loams is the only undifferentiated group in this survey area.

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

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

Soil descriptions

Ah—Alapaha loamy sand. This deep, poorly drained, nearly level soil is along the upper part of drainageways and in depressions on uplands. It is occasionally flooded for brief periods from winter to mid spring. Slope is 0 to 2 percent. Areas are 5 to 150 acres.

Typically, the surface layer is very dark gray loamy sand about 6 inches thick. The subsurface layer is loamy sand and extends to a depth of 30 inches. It is dark gray in the upper part and gray in the lower part. The subsoil is sandy clay loam and extends to a depth of 80 inches or more. The upper few inches of the subsoil is gray and has brownish yellow and strong brown mottles, and the rest of the subsoil is mottled yellowish brown, red, light gray, and strong brown. Plinthite is below a depth of about 42 inches.

This soil is low in natural fertility and organic matter. It is very strongly acid or strongly acid throughout except for the surface layer in limed areas. Permeability is rapid in the surface and subsurface layers, moderate in the upper part of the subsoil, and moderately slow in the lower part of the subsoil. Available water capacity is medium. Tilth is good. The root zone is deep; however,

during winter and spring the water table commonly is at a depth of 0.5 foot to 1.5 feet and limits root penetration.

Included in mapping are small areas of Leefield and Ardilla soils.

This Alapaha soil is poorly suited to cultivated crops because of wetness and flooding. It is moderately suited to pasture.

This soil is well suited to slash pine and loblolly pine. Wetness is the main limitation to equipment use in managing and harvesting the tree crop. This limitation can be overcome by using special equipment by logging during the drier seasons, and, in some areas, by drainage.

This soil is poorly suited to most urban and recreation uses because of the wetness and flooding. Unless outlets are available for drainage and unless flooding is controlled, overcoming these limitations is difficult.

The map unit is capability subclass Vw and woodland suitability group 2w.

An—Alapaha-Urban land complex. This complex consists of areas of Alapaha soils and areas of Urban land that are so intermingled that they could not be mapped separately at the scale selected. It is on the upper part of drainageways and in depressions. Slope is 0 to 2 percent. Areas are 3 to 35 acres.

Alapaha loamy sand makes up about 50 percent of each mapped area. Typically, the surface layer is very dark gray loamy sand about 5 inches thick. The subsurface layer extends to a depth of 32 inches. It is loamy sand that is gray and has very dark gray mottles. The subsoil is sandy clay loam and extends to a depth of 80 inches or more. The upper part of the subsoil is gray and has brownish yellow and strong brown mottles, and the lower part is mottled yellowish brown, light gray, red, and strong brown. Plinthite is below a depth of about 42 inches.

This soil is low in natural fertility and organic matter. It is very strongly acid or strongly acid throughout except for the surface layer in limed areas. Permeability is rapid in the surface and subsurface layers, moderate in the upper part of the subsoil, and moderately slow in the lower part of the subsoil. Available water capacity is medium. Tilth is good. The root zone is deep; however, during winter and spring the water table commonly is at a depth of 0.5 foot to 1.5 feet and limits root penetration.

Urban land makes up about 40 percent of each mapped area. Most of this land is covered by shopping centers, schools, parking lots, streets, industrial and commercial buildings, and private dwellings. The original soil material has been altered by cutting, filling, and shaping.

The soil in this complex is used primarily for urban development. However, wetness and flooding are limitations to that use. Artificial drainage can be used to reduce wetness if outlets are available. Shrubs, shade trees, turf, and lawns can grow well if the soil is adequately drained.

This complex is in capability class Vw. It is not assigned to a woodland suitability group.

AoA—Albany sand. This deep, somewhat poorly drained, nearly level soil is in smooth, low-lying upland areas. Slope is 0 to 2 percent. Areas are 5 to 30 acres.

Typically, the surface layer is dark gray sand about 6 inches thick. The subsurface layer extends to a depth of 53 inches. It is light yellowish brown sand that is mottled light gray and yellowish brown. The subsoil is dominantly sandy clay loam and extends to a depth of 80 inches or more. It is mottled pale brown, light gray, light yellowish brown, and yellowish brown.

This soil is low in natural fertility and organic matter. It is very strongly acid or strongly acid throughout except for the surface layer in limed areas. Permeability is rapid in the surface layer and thick subsurface layer and moderate in the subsoil. Available water capacity is low. Tilth is good, and the soil can be worked throughout a wide range in moisture content. The root zone is deep; however, during winter and early in spring the water table is at a depth of 1 foot to 2.5 feet and limits root penetration.

Included in mapping are small areas of Lakeland, Ocilla, and Pelham soils.

This Albany soil is moderately suited to corn, tobacco, soybeans, hay, and pasture. It is limited for cropland use because of wetness and low available water capacity. Drainage commonly can overcome the wetness limitation. Returning crop residue to the soil helps increase the available water capacity of the soil.

This soil is moderately suited to loblolly pine and slash pine. Equipment limitation and seedling mortality are concerns in woodland management. Wetness limits the use of conventional equipment. In most places, equipment can be used during the drier months. In some places, it cannot be used at all.

This soil is poorly suited to most urban uses because of wetness. This limitation, however, commonly can be reduced by drainage. This soil is poorly suited also to recreation development because it is too sandy and because it is wet in winter and early in spring.

This map unit is in capability subclass IIIw and woodland suitability group 2w.

ArA—Ardilla loamy sand. This deep, somewhat poorly drained, nearly level soil is in smooth, low-lying upland areas. Slope is 0 to 2 percent. Areas are 3 to 28 acres.

Typically, the surface layer is very dark gray loamy sand about 8 inches thick. The subsurface layer is dark grayish brown loamy sand about 4 inches thick. The subsoil is dominantly sandy clay loam and extends to a depth of 65 inches or more. The upper part of the subsoil is light yellowish brown; the middle part is yellowish brown and has light gray and strong brown mottles; and the lower part is mottled yellowish brown, light gray, red, yellowish red, and strong brown. The

subsoil is firm, brittle, and compact below a depth of about 34 inches.

This soil is low in natural fertility and organic matter. It is very strongly acid or strongly acid throughout except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Available water capacity is medium. Tilth is good. The root zone is deep; however, from late fall to mid spring the water table commonly is at a depth of 1 foot to 2 feet and limits root penetration.

Included in mapping are small areas of Alapaha, Clarendon, and Leefield soils. Also included are areas of poorly drained and very poorly drained soils less than 3 acres. They are indicated by a wet spot symbol on the map.

This Ardilla soil is well suited to corn, soybeans, pasture, and truck crops; however, it is somewhat limited for cropland use because of wetness. Drainage commonly can help overcome this limitation.

This soil is well suited to longleaf pine, slash pine, and yellow-poplar. The use of conventional equipment commonly is restricted from late fall to mid spring because of wetness.

This soil is poorly suited to most urban and recreation uses because of wetness. This limitation commonly can be reduced by drainage.

This map unit is in capability subclass IIw and woodland suitability group 2w.

CaB2—Carnegie sandy loam, 3 to 5 percent slopes, eroded. This deep, well drained, very gently sloping soil is on ridgetops and hillsides on uplands. The surface layer is a mixture of the original surface soil and the upper part of the subsoil. In most places, the landscape is undulating. It is characterized by rills or galled spots and by shallow gullies. It is deeply gullied in places. Areas are 5 to 30 acres.

Typically, the surface layer is dark grayish brown sandy loam about 5 inches thick. The subsoil is dominantly sandy clay and extends to a depth of 65 inches or more. The upper part of the subsoil is strong brown; the middle part is strong brown and has red and yellowish brown mottles; and the lower part is mottled strong brown, yellowish brown, red, light gray, and very pale brown. Nodules of ironstone are in the surface layer and throughout the upper and middle parts of the subsoil.

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderately slow, and available water capacity is medium. Runoff is rapid. Tilth is good. The root zone is deep and is easily penetrated by the roots.

Included in mapping are areas of Cowarts and Tifton soils. Also included are areas of uneroded soils that have a loamy sand surface layer.

This Carnegie soil is only moderately suited to row crops and small grain because of the rapid runoff and the somewhat gullied landscape. It is moderately suited to hay and pasture. Good tilth can be maintained in most places by returning crop residue to the soil. Erosion is a moderate hazard if cultivated crops are grown. Conservation tillage and the use of cover crops, including grasses and legumes, in the cropping system help reduce runoff and control erosion.

This soil is well suited to slash pine and loblolly pine (fig. 1). There are no significant limitations to woodland use.

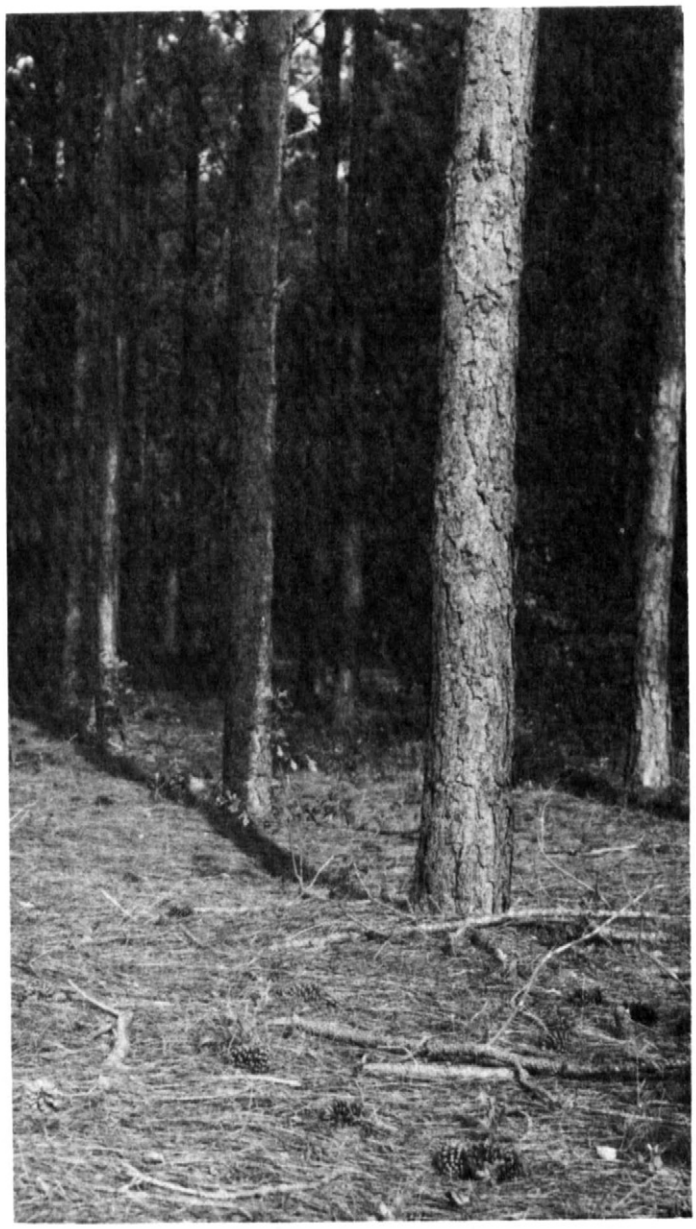


Figure 1.—Slash pine on Carnegie sandy loam, 3 to 5 percent slopes, eroded. This soil is well suited to the common tree crops.

This soil is well suited to most urban uses. However, the moderately slow permeability of the subsoil limits its use as septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation. This soil is only moderately suited to most recreation uses because the subsoil has moderately slow permeability.

This map unit is in capability subclass IIIe and woodland suitability group 2o.

CaC2—Carnegie sandy loam, 5 to 8 percent slopes, eroded. This deep, well drained, gently sloping soil is on hillsides on uplands. The surface layer is a mixture of the original surface soil and the upper part of the subsoil. In most places the slopes are short and irregular. They are characterized by rills and galled spots. In places, they are deeply gullied. Areas are 8 to 40 acres.

Typically, the surface layer is brown sandy loam about 5 inches thick. The subsoil is dominantly sandy clay and extends to a depth of 65 inches or more. The upper part of the subsoil is strong brown; the middle part is strong brown and has red and yellowish brown mottles; and the lower part is mottled strong brown, red, yellowish red, and yellowish brown. Nodules of ironstone are in the surface layer and throughout the upper and middle parts of the subsoil. Plinthite makes up about 5 to 10 percent of the middle and lower parts of the subsoil, at a depth of 19 to 65 inches or more.

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderately slow, and available water capacity is medium. Runoff is rapid. Tilth is good. The root zone is deep and is easily penetrated by the roots.

Included in mapping are areas of Sunsweet and Tifton soils. Also included are severely eroded soils that have a sandy clay loam surface layer.

This Carnegie soil is poorly suited to row crops and small grain because of the rapid runoff and the gullied, short, irregular slopes. It is moderately suited to hay and pasture. Good tilth can be maintained by returning crop residue to the soil. Erosion is a very severe hazard if cultivated crops are grown. Conservation tillage and the use of cover crops, including grasses and legumes, in the cropping system help reduce runoff and control erosion.

This soil is well suited to slash pine and loblolly pine. There are no significant limitations to woodland use.

This soil is well suited to most urban uses. However, the moderately slow permeability of the subsoil limits the use of this soil as septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation. This soil is only moderately suited to most recreation uses because the subsoil has moderately slow permeability.

This map unit is in capability subclass IVe and woodland suitability group 2o.

Cn—Clarendon loamy sand. This deep, moderately well drained, nearly level soil is near natural ponds and drainageways on the higher lying uplands. Areas are 5 to 30 acres.

Typically, the surface layer is dark grayish brown loamy sand about 8 inches thick. The subsoil is dominantly sandy clay loam and extends to a depth of 65 inches or more. The upper few inches of the subsoil is light yellowish brown, and the rest of the subsoil is mainly mottled brown, red, and gray. Plinthite makes up 5 to 10 percent of the lower part of the subsoil, below a depth of about 24 inches. Nodules of ironstone are throughout the soil.

This soil is low in natural fertility and organic matter. It is very strongly acid or strongly acid throughout except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Available water capacity is medium. Tilth is good, and the soil can be worked throughout a wide range in moisture content. The root zone is deep and is easily penetrated by the roots.

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

This Clarendon soil is well suited to corn, cotton, tobacco, soybeans, hay, and pasture; however, wetness is a limitation. In most places, drainage is needed for high yields.

This soil is well suited to slash pine, loblolly pine, sweetgum, and yellow-poplar. Wetness is the main limitation to equipment use in managing and harvesting the tree crop. The equipment can be used during the drier seasons.

This soil is only moderately suited to most urban and recreation uses because of wetness. This limitation commonly can be reduced by drainage.

This map unit is in capability subclass IIw and woodland suitability group 2w.

CoB—Cowarts loamy sand, 2 to 5 percent slopes. This deep, well drained, very gently sloping soil is on ridgetops and hillsides on uplands. Slopes are irregular, undulating, and convex. Areas are 5 to 30 acres.

Typically, the surface layer is loamy sand about 9 inches thick. The upper part is dark grayish brown and the lower part is light yellowish brown. The subsoil is mainly yellowish brown sandy clay loam and extends to a depth of about 36 inches. It has red and very pale brown mottles in the lower part. The substratum, to a depth of 65 inches or more, is coarsely mottled yellowish brown, yellowish red, strong brown, red, and light gray sandy clay loam that has strata of sandy loam and sandy clay.

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate in the subsoil and slow in the substratum.

Available water capacity is medium. Runoff is medium. Tilth is good. This soil can be worked throughout a wide range in moisture content. The root zone is deep and is easily penetrated by the roots.

Included in mapping are soils like Cowarts soils except they have more clay in the upper part of the subsoil. Also included are areas of Sunsweet and Esto soils and areas of eroded soils that have a sandy clay loam surface layer. Wet areas smaller than 3 acres, indicated by a wet spot symbol on the map, are included also.

This Cowarts soil is only moderately suited to row crops, small grain, hay, and pasture because of the compact substratum and the irregular undulating landscape. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a moderate hazard if cultivated crops are grown. Conservation tillage and the use of cover crops, including grasses and legumes, in the cropping system help reduce runoff and control erosion.

This soil is well suited to slash pine and loblolly pine. There are no significant limitations to woodland use or management.

This soil is well suited to most urban uses. However, the slow permeability of the substratum limits the use of this soil as septic tank absorption fields. In most places, this limitation can be overcome by special design and installation. Also because of the slow permeability of the substratum, this soil is only moderately suited to most recreation uses.

This map unit is in capability subclass IIe and woodland suitability group 2o.

CrC2—Cowarts sandy loam, 5 to 8 percent slopes, eroded. This deep, well drained, gently sloping soil is on hillsides on uplands. The surface layer is a mixture of the original surface soil and the upper part of the subsoil. In most places, slopes are short and irregular. They are characterized by rills and galled spots. In places, they are gullied. Areas are 10 to 50 acres.

Typically, the surface layer is dark grayish brown sandy loam about 5 inches thick. The subsoil is sandy clay loam and extends to a depth of 26 inches. It is yellowish brown throughout and has red and yellowish red mottles in the lower part. The substratum, to a depth of 62 inches or more, is mottled and streaked yellowish brown, light gray, red, and strong brown sandy clay loam and has pockets of sandy loam.

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate in the subsoil and slow in the substratum. Available water capacity is medium. Runoff is rapid. Tilth is good. The root zone is deep and is easily penetrated by the roots.

Included in mapping are soils like Cowarts soils except they have more clay in the upper part of the subsoil. Also included are areas of Sunsweet and Esto soils and areas of eroded soils that have a sandy clay loam surface layer.

This Cowarts soil is poorly suited to row crops and small grain because of the rapid runoff and the irregular, gullied landscape. 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 cultivated crops are grown. Conservation tillage and the use of cover crops, including grasses and legumes, in the cropping system help reduce runoff and control erosion.

This soil is well suited to slash pine and loblolly pine. There are no significant limitations to woodland use or management.

This soil is well suited to most urban uses. However, the slow permeability of the substratum limits the use of this soil as septic tank absorption fields. In most places, this limitation can be overcome by special design and installation. Also because of the slow permeability of the substratum, this soil is only moderately suited to most recreation uses.

This map unit is in capability subclass IVe and woodland suitability group 2o.

DoA—Dothan loamy sand, 0 to 2 percent slopes. This deep, well drained, nearly level soil is on ridgetops on uplands. Areas are 10 to 40 acres.

Typically, the surface layer is dark grayish brown loamy sand about 10 inches thick. The subsoil is dominantly sandy clay loam and extends to a depth of 66 inches or more. The upper part of the subsoil is yellowish brown; the middle part is yellowish brown and has yellowish red and strong brown mottles; and the lower part is mottled yellowish brown, red, gray, and strong brown. Plinthite makes up 8 to 12 percent of the lower part of the subsoil, below a depth of about 36 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. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Available water capacity is medium. Tilth is good. The soil can be worked throughout a wide range in moisture content. The root zone is deep and is easily penetrated by the roots.

Included in mapping are a few small areas of Fuquay and Tifton soils. Also included are wet areas smaller than 3 acres. These areas are indicated by a wet spot symbol on the map.

This Dothan soil is well suited to row crops, small grain, hay, and pasture. During dry seasons, high yields can be obtained by irrigating. Conservation tillage and the use of cover crops, including grasses and legumes, in the cropping system help increase the organic matter content of the soil and conserve moisture.

This soil is well suited to slash pine and loblolly pine. There are no significant limitations to woodland use or management.

This soil is well suited to most urban and recreation uses. However, the moderately slow permeability of the

lower part of the subsoil limits the use of the soil as septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation.

This map unit is in capability class I and woodland suitability group 2o.

DoB—Dothan loamy sand, 2 to 5 percent slopes. This deep, well drained, very gently sloping soil is on ridgetops and hillsides on uplands. Slopes commonly are smooth and convex. Areas are 5 to 90 acres.

Typically, the surface layer is dark grayish brown loamy sand about 9 inches thick. The subsoil is dominantly sandy clay loam and extends to a depth of 74 inches or more. The upper part of the subsoil is yellowish brown; the middle part is yellowish brown and has red, very pale brown, and strong brown mottles; and the lower part is mottled yellowish brown, white, red, and strong brown. Plinthite makes up 5 to 10 percent of the lower part of the subsoil, below a depth of 37 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. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Available water capacity is medium. This soil has good tilth and can be worked throughout a wide range in moisture content. The root zone is deep and is easily penetrated by the roots.

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

This Dothan soil is well suited to row crops, small grain, pecans, hay, and pasture. During dry seasons, high yields can be obtained by irrigating. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a moderate hazard if cultivated crops are grown. Conservation tillage and the use of cover crops, including grasses and legumes, in the cropping system help reduce runoff and control erosion.

This soil is well suited to loblolly pine and slash pine. There are no significant limitations to woodland use or management.

This soil is well suited to most urban and recreation uses. However, the moderately slow permeability of the lower part of the subsoil limits the use of this soil as septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation.

This map unit is in capability subclass IIe and woodland suitability group 2o.

EuB—Esto sandy loam, 2 to 5 percent slopes. This deep, well drained, very gently sloping soil is on ridgetops and hillsides on uplands. Slopes commonly are smooth and convex. Areas are 5 to 40 acres.

Typically, the surface layer is dark grayish brown sandy loam about 6 inches thick. The subsoil extends to a depth of 65 inches or more. The upper few inches of the subsoil is strong brown sandy clay that has yellowish red mottles; the middle part is mottled yellowish red and brownish yellow clay; and the lower part is mottled light gray, red, brownish yellow, and strong brown clay. A few nodules of ironstone commonly are in the surface layer and in the upper part of the subsoil.

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is slow, and available water capacity is medium. Runoff is rapid. Tilth is good. The root zone is deep.

Included in mapping are small areas of Carnegie and Cowarts soils. In some eroded places the surface layer is sandy clay loam. Rock outcrops smaller than 1 acre, indicated by a rock outcrop symbol on the map, are included also.

This Esto soil is moderately suited to row crops, small grain, hay, and pasture. Because of rapid runoff, erosion is a hazard if cultivated crops are grown. Conservation tillage and the use of cover crops, including grasses and legumes, in the cropping system help reduce runoff and control erosion. Good tilth can be maintained in most places by returning crop residue to the soil.

This soil is moderately suited to loblolly pine and slash pine. There are no significant limitations to woodland use or management.

This soil is moderately suited to most urban and recreation uses. The slow permeability of the subsoil limits this soil for use as septic tank absorption fields and for most recreation uses. Shrink-swell potential is a limitation for most types of building site development.

This map unit is in capability subclass IIIe and woodland suitability group 3o.

EuC—Esto sandy loam, 5 to 8 percent slopes. This deep, well drained, gently sloping soil is on hillsides on uplands. In most places the slopes are irregular and convex and the landscape is choppy. Areas are 5 to 30 acres.

Typically, the surface layer is dark grayish brown sandy loam about 6 inches thick. The subsoil extends to a depth of 65 inches or more. The upper few inches of the subsoil is reddish yellow sandy clay loam, and the rest of the subsoil is mottled reddish, brownish, yellowish, and grayish sandy clay. A few nodules of ironstone are in the surface layer.

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is slow, and available water capacity is medium. Runoff is rapid. Tilth is good. The root zone is deep.

Included in mapping are small areas of Carnegie and Susquehanna soils. In some eroded areas, gullies and rills are common. Rock outcrops smaller than 1 acre, indicated by a rock outcrop symbol on the map, are included also.

This Esto soil is poorly suited to row crops and small grain because of the choppiness of the landscape and the rapid runoff and severe erosion hazard. It is moderately suited to pasture.

This soil is moderately suited to loblolly pine and slash pine. There are no significant limitations to woodland use or management.

This soil is moderately suited to most urban and recreation uses. The slow permeability of the subsoil limits this soil for use as septic tank absorption fields and for most recreation uses. Shrink-swell potential is a limitation for most types of building site development.

This map unit is in capability subclass IVe and woodland suitability group 3o.

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

Typically, the surface layer is dark grayish brown loamy sand about 10 inches thick. The subsurface layer is light yellowish brown loamy sand and extends to a depth of 32 inches. The subsoil is mainly sandy clay loam and extends to a depth of more than 80 inches. The upper part of the subsoil is yellowish brown; the middle part is yellowish brown and has red and light gray mottles; and the lower part is mottled brownish yellow, red, light gray, and yellowish red. Plinthite makes up 8 percent of the lower part of the subsoil, below a depth of about 46 inches. A few nodules of ironstone are throughout the upper 46 inches of the soil.

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil and slow in the lower part. Available water capacity is low. Runoff is slow. Tilth is good, and the soil can be worked throughout a wide range in moisture content. The root zone is deep and is easily penetrated by the roots.

Included in mapping are a few small areas of Dothan and Lakeland soils. Also included are some areas of soils that have more nodules of ironstone than is common for Fuquay soils. Wet areas smaller than 3 acres, indicated by a wet spot symbol on the map, are included also.

This Fuquay soil is only moderately suited to row crops, small grain, hay, and pasture because of the low available water capacity. Returning crop residue to the soil helps overcome this limitation. During dry seasons, high yields can be obtained by irrigating.

This soil is moderately suited to slash pine and longleaf pine. Seedling mortality is a concern in woodland management.

This soil is well suited to most urban uses. However, the slow permeability of the lower part of the subsoil somewhat limits the use of this soil as septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation. Because of its sandiness, this soil is only moderately suited to recreation development.

This map unit is in capability subclass IIs and woodland suitability group 3s.

Gr—Grady sandy loam. This deep, poorly drained, nearly level soil is in saucer-shaped depressions on uplands. It commonly is ponded from winter to early summer. Slope is 0 to 2 percent. Areas range from 3 to 15 acres.

Typically, the surface layer is very dark gray sandy loam about 8 inches thick. The subsoil extends to a depth of 65 inches or more. The upper few inches of the subsoil is gray sandy clay loam that has yellowish brown mottles, and the rest of the subsoil 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. It is very strongly acid or strongly acid throughout except for the surface layer in limed areas. Permeability is slow, and available water capacity is medium. Tilth is good. From winter to early summer this soil commonly is saturated or ponded and plant growth is limited.

Included in mapping are small areas of Alapaha and Clarendon soils. Also included are areas of a soil that is similar to Grady soils but has a loam surface layer.

This Grady soil is poorly suited to cultivated crops because of the wetness and ponding. It is moderately suited to pasture.

Baldcypress, blackgum, and water oak are common trees on this soil. Ponding is the main limitation to equipment use and to seedling survival for other than the common water-tolerant trees. If this soil is drained, however, it is well suited to loblolly pine and slash pine. Drainage also significantly reduces the equipment limitation.

This soil is poorly suited to most urban and recreation uses because of ponding. This limitation is difficult to overcome.

This map unit is in capability subclass Vw and woodland suitability group 4w.

KeC—Kershaw coarse sand, 2 to 8 percent slopes. This deep, excessively drained, very gently sloping and gently sloping soil is on ridgetops and hillsides on uplands. Slopes are irregular and convex. Areas are 10 to 80 acres.

Typically, the surface layer is grayish brown coarse sand about 3 inches thick. The underlying layers to a depth of 90 inches or more are coarse sand. The upper layer is yellowish brown and has dark yellowish brown mottles, the middle layer is yellowish brown, and the lower layer is yellow.

This soil is very low in natural fertility and organic matter. It is very strongly acid or strongly acid throughout except for the surface layer in limed areas. Permeability is very rapid, and available water capacity is very low. Tilth is good. Runoff is slow. The root zone is easily penetrated by the roots.

Included in mapping are small areas of Albany and Lakeland soils.

This Kershaw soil is rarely used for cultivated crops and pasture because of the very low available water capacity.

This soil is poorly suited to slash pine and longleaf pine. Because the soil has very low available water capacity, seedling mortality is a concern. The use of conventional equipment is limited by the sandiness of this soil.

This soil is suited to most urban uses. However, seepage is a limitation for most sanitary facilities. Because of its sandiness this soil is poorly suited to recreation development.

This map unit is in capability subclass VIIs and woodland suitability group 5s.

KO—Kinston and Osier fine sandy loams. This map unit consists of deep, poorly drained, nearly level soils that are on flood plains of most of the major streams. It consists mainly of areas of Kinston fine sandy loam and areas of Osier fine sandy loam that are closely associated in an irregular pattern. Both soils are in each mapped area; however, the relative proportion of the soils varies. Because of present and predicted use, they were not separated in mapping. These soils commonly are flooded for brief periods, mainly from late fall to mid spring. Slope is 0 to 2 percent. Areas range from 50 to 150 acres.

A typical area is about 60 percent Kinston soils, 25 percent Osier soils, and 15 percent Ocilla and Rains soils and bodies of water smaller than 10 acres. The proportion of each major soil varies. The poorly drained Rains soils are in smooth upland areas and in slight depressions on terraces near the major streams. The somewhat poorly drained Ocilla soils are on stream terraces.

Typically, the Kinston soil has a surface layer of dark gray fine sandy loam about 6 inches thick. The subsoil is mainly sandy clay loam and extends to a depth of 60 inches or more. It is gray and has yellow and brown mottles.

The Kinston soil is strongly acid or very strongly acid throughout. Permeability is moderate, and available water capacity is medium. The water table is within 1 foot of the surface from late fall to early summer.

Typically, the Osier soil has a surface layer of dark gray fine sandy loam about 6 inches thick. The underlying layers to a depth of 65 inches or more are grayish sand or loamy coarse sand that has yellow and brown mottles.

The Osier soil is very strongly acid or strongly acid throughout. Permeability is rapid, and available water capacity is low. The water table is within 1 foot of the surface from late fall to early spring.

These soils are used mainly as woodland. They are well suited to loblolly pine, slash pine, and sweetgum. Wetness is the main limitation to equipment use in managing and harvesting the tree crop. The equipment can be used during the drier months.

These soils are poorly suited to farming and recreation development because of wetness and flooding. They are severely limited for urban uses because of the flooding and wetness. These limitations can be overcome only by extensive flood control and drainage.

This undifferentiated group is in capability subclass Vw. The Kinston soil is in woodland suitability group 1w, and the Osier soil is in group 3w.

LaB—Lakeland sand, 0 to 5 percent slopes. This deep, excessively drained, nearly level and very gently sloping soil is on broad ridgetops on uplands. Slopes are smooth and convex in most places. Areas are 5 to 200 acres.

Typically, the surface layer is dark grayish brown sand about 4 inches thick. The underlying layers, to a depth of 85 inches or more, are sand. These layers are yellowish brown, and the lower layer has very pale brown mottles.

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is very rapid, and available water capacity is low. Runoff is slow. The soil has good tilth. The deep root zone is easily penetrated by the roots.

Included in mapping are a few small areas of Albany and Fuquay soils. Also included are a few small areas of soils that have more clay below a depth of 70 to 80 inches than is common to Lakeland soils.

This Lakeland soil is poorly suited to row crops, small grain, hay, and pasture because of the low available water capacity and low fertility. Returning crop residue to the soil helps overcome these limitations. Yields for the crops commonly grown can be increased if this soil is irrigated.

This soil is moderately suited to loblolly pine and slash pine. Equipment limitations and seedling mortality are concerns in woodland management.

This soil is well suited to most urban uses. However, seepage is a limitation for most sanitary facilities. Because of its sandiness, this soil is poorly suited to most recreation uses.

This map unit is in capability subclass IVs and woodland suitability group 4s.

LaC—Lakeland sand, 5 to 8 percent slopes. This deep, excessively drained, gently sloping soil is on hillsides on uplands. Slopes are convex. Areas are 5 to 50 acres.

Typically, the surface layer is dark grayish brown sand about 4 inches thick. The underlying layers to a depth of 80 inches or more are sand. These layers are yellowish brown, and the lower layer also has very pale brown and strong brown mottles.

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is very rapid, and available water capacity is low. Runoff is slow. The soil has good tilth. The deep root zone is easily penetrated by roots.

Included with this soil in mapping are a few small areas of Kershaw and Fuquay soils. Also included are a few small areas of soils that have more clay below a depth of 70 to 80 inches than is common to Lakeland soils.

This Lakeland soil is poorly suited to row crops, small grain, hay, and pasture because of the low available water capacity and low fertility.

This soil is moderately suited to loblolly pine and slash pine. Equipment limitations and seedling mortality are concerns in woodland management.

This soil is well suited to most urban uses. However, seepage is a limitation for most sanitary facilities. Because of its sandiness this soil is poorly suited to recreation development.

This map unit is in capability subclass VIs and woodland suitability group 4s.

Le—Leefield loamy sand. This deep, somewhat poorly drained, nearly level soil is on low-lying smooth uplands. Slope is 0 to 3 percent. Areas are 5 to 80 acres.

Typically, the surface layer is very dark gray loamy sand about 6 inches thick. The subsurface layer is very dark gray loamy sand about 6 inches thick. The subsurface layer extends to a depth of 35 inches. It is light brownish gray loamy sand and has pale yellow mottles. The subsoil is dominantly sandy clay loam and extends to a depth of 80 inches or more. The upper part of the subsoil is light yellowish brown and has light gray mottles; the middle part is light yellowish brown and has light gray and brownish yellow mottles; and the lower part is mottled yellowish brown, light gray, light yellowish brown, and red. Plinthite makes up about 5 percent of the lower part of the subsoil, below a depth of about 40 inches.

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Available water capacity is low. Runoff is slow. Tilth is good, and this soil can be worked throughout a wide range in moisture content. The root zone is deep; however, in winter and early in spring the water table commonly is at a depth of 1.5 to 2.5 feet and limits root penetration.

Included in mapping are a few small areas of Alapaha and Stilson soils. Also included are wet areas smaller than three acres. These areas are indicated by a wet spot symbol on the map.

This Leefield soil is moderately suited to corn, tobacco, and truck crops. Unless drained, this soil is limited for cropland use because of wetness.

This soil is moderately suited to slash pine and loblolly pine. Wetness is the main limitation to equipment use in managing and harvesting the tree crop. The equipment can be used during the drier seasons. Drainage is needed to overcome seedling mortality.

This soil is only moderately suited to most urban and recreation uses because of wetness. This limitation commonly can be reduced by drainage.

This map unit is in capability subclass IIw and woodland suitability group 3w.

Mn—Mascotte sand. This deep, poorly drained, nearly level soil is in broad, low-lying smooth areas. Slopes are 0 to 2 percent. Areas are 5 to 30 acres.

Typically, the surface layer is very dark gray sand about 4 inches thick. The subsurface layer is light gray sand that extends to a depth of 10 inches. It is underlain by an organically stained layer of sand that extends to a depth of 20 inches. The upper part of that layer is dark reddish brown, and the lower part is dark brown. Below that, to a depth of 28 inches, is light grayish brown sand that has light gray mottles. Light gray sandy clay loam that has yellowish brown and yellowish red mottles extends to a depth of 62 inches or more.

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and available water capacity is low. Tilth is good. The weakly cemented organically stained layer somewhat restricts root penetration. In winter and spring the water table commonly is within 1 foot of the surface and restricts root penetration.

Included in mapping are a few small areas of Alapaha, Leefield, and Olustee soils.

This Mascotte soil is poorly suited to cultivated crops and pasture because of wetness and the weakly cemented organically stained layer.

This soil is moderately suited to slash pine and loblolly pine. Wetness is the main limitation to equipment use in managing and harvesting the tree crop. The equipment can be used during the drier seasons. Drainage is needed to overcome high seedling mortality.

This soil is poorly suited to most urban and recreation uses because of wetness. The wetness can be reduced by drainage.

This map unit is in capability subclass IVw and woodland suitability group 3w.

Oc—Ocilla loamy sand. This deep, somewhat poorly drained, nearly level soil is in low-lying areas on uplands. Slope is 0 to 2 percent. Areas range from 5 to 50 acres.

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

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and available water capacity is low. Runoff is slow. Tilth is good. This soil can be worked throughout a wide range in moisture content. The root zone is deep; however, from winter to mid spring the water table commonly is at a depth of 1 foot to 2.5 feet and limits root penetration.

Included in mapping are a few small areas of Pelham and Stilson soils. Also included are wet areas less than two acres. These areas are indicated by a wet spot symbol on the map.

This Ocilla soil is only moderately suited to corn, tobacco, and truck crops. Unless the soil is drained, wetness is a limitation to cropland use.

This soil is moderately suited to slash pine and loblolly pine. Wetness is the main limitation to equipment use in managing and harvesting the tree crop. The equipment can be used during the drier seasons. Drainage is needed to overcome seedling mortality.

This soil is poorly suited to most urban uses and only moderately suited to recreation uses because of wetness. This limitation commonly can be reduced by drainage.

This map unit is in capability subclass IIIw and woodland suitability group 3w.

Of—Ocilla loamy sand, occasionally flooded. This deep, somewhat poorly drained, nearly level soil is on stream terraces. It is occasionally flooded for brief periods from winter to mid spring. Slope is 0 to 2 percent. Areas range from 5 to 40 acres.

Typically, the surface layer is very dark gray loamy sand about 6 inches thick. The subsurface layer is loamy sand to a depth of 27 inches. The upper part of that layer is light brownish gray and has pale brown mottles, and the lower part is pale brown and has light brownish gray mottles. The subsoil dominantly is sandy clay loam and extends to a depth of 80 inches or more. The upper part of the subsoil is brownish yellow and has gray mottles; the middle part is brownish yellow and has light gray and yellowish red mottles; and the lower part is mottled light yellowish brown, light gray, and red.

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and available water capacity is low. Runoff is slow. Tilth is good. This soil can be worked throughout a wide range in moisture content. The root zone is deep; however, from winter to mid spring the water table commonly is at a depth of 1 foot to 2.5 feet and limits root penetration.

Included in mapping are a few small areas of Rains soils.

This Ocilla soil is poorly suited to corn, soybeans, and pasture because of wetness and flooding.

This soil is used mainly as woodland. It is moderately suited to slash pine and loblolly pine. Wetness and flooding are the main limitations to equipment use in managing and harvesting the tree crop. The equipment can be used during the drier seasons. Drainage is needed to overcome high seedling mortality.

This soil is poorly suited to most urban and recreation uses because of wetness and flooding. These limitations are difficult to overcome.

This map unit is in capability subclass IVw and woodland suitability group 3w.

OnA—Ocilla-Urban land complex. This complex consists of areas of deep, somewhat poorly drained Ocilla soil and areas of Urban land that are so intermingled that they could not be mapped separately at the scale selected. It is in nearly level, low-lying upland areas. Slope is 0 to 2 percent. Areas are 4 to 40 acres.

Ocilla loamy sand makes up about 55 percent of each mapped area. Typically, the surface layer is very dark gray loamy sand about 6 inches thick. The subsurface layer is loamy sand and extends to a depth of 32 inches. The upper part of that layer is light brownish gray, and the lower part is pale brown and has light yellowish brown and light gray mottles. The subsoil dominantly is sandy clay loam and extends to a depth of 80 inches or more. The upper part of the subsoil is brownish yellow and has light gray and yellowish brown mottles; the middle part is brownish yellow and has light gray, yellowish brown, and yellowish red mottles; and the lower part is mottled light yellowish brown, light gray, yellowish brown, strong brown, and brown.

This Ocilla soil is low in natural fertility and organic matter. It is very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate and available water capacity is low. Runoff is slow. Tilth is good. This soil can be worked throughout a wide range in moisture content. The root zone is deep; however, from winter to mid spring the water table commonly is at a depth of 1 foot to 2.5 feet and limits root penetration.

Urban land makes up about 35 percent of each mapped area. Most of this land is covered by shopping centers, schools, parking lots, streets, industrial and commercial buildings, and private dwellings. The original soil material has been altered by cutting, filling, and shaping.

The Ocilla soil is used for urban purposes, including building sites, gardens, shrubs, shade trees, and lawns. Wetness is a limitation to urban use; however, it commonly can be overcome by drainage, filling, or other measures. Because the Ocilla soil has a seasonally high water table, it is best suited to water tolerant plants for landscaping and gardening.

The Ocilla soil is in capability subclass IIIw. It is not placed in a woodland suitability group.

Os—Olustee sand. This deep, poorly drained, nearly level soil is in broad, smooth, low-lying areas. Slope is 0 to 2 percent. Areas are 5 to 40 acres.

Typically, the surface layer is very dark gray sand about 8 inches thick. The layer below that, to a depth of 13 inches, is dark brown sand that is organically stained and weakly cemented. The next layer, to a depth of 20 inches, is dark brown sand that is weakly cemented in places. In the next 14 inches the soil is light gray sand that has light yellowish brown mottles. Below that, light gray sandy clay loam that has yellowish brown, yellowish red, and light yellowish brown mottles extends to a depth of 65 inches or more.

This soil is low in natural fertility and organic matter. It is very strongly acid or strongly acid throughout except for the surface layer in limed areas. Permeability is moderate except in the rapidly permeable loose or very friable layers. Available water capacity is low. Tilth is good. The weakly cemented, organically stained layer somewhat restricts root penetration. The root zone is deep; however, in winter and spring the water table commonly is within 1 foot of the surface and limits root penetration.

Included in mapping are a few areas of Leefield and Pelham soils.

This Olustee soil is only moderately suited to most commonly grown row crops and vegetables because of wetness. In addition, the weakly cemented organically stained layer somewhat restricts root penetration.

This soil is moderately suited to slash pine and loblolly pine. Wetness is the main limitation to equipment use in managing and harvesting the wood crop. The equipment can be used during the drier seasons. Drainage is needed to overcome seedling mortality.

This soil is poorly suited to most urban and recreation uses because of wetness. This limitation can be partly overcome by drainage.

This map unit is in capability subclass IIIw and woodland suitability group 3w.

Pe—Pelham loamy sand. This deep, poorly drained, nearly level soil is in broad smooth areas and in depressions on uplands and near drainageways. It is occasionally flooded for brief periods from winter to mid spring. Slope is 0 to 2 percent. Areas are 5 to 40 acres.

Typically, the surface layer is dark gray loamy sand about 5 inches thick. The subsurface layer is gray loamy sand and extends to a depth of 26 inches. The subsoil is dominantly sandy clay loam and extends to a depth of 80 inches or more. It is light gray throughout except it has light yellowish brown, brownish yellow, strong brown, and yellowish red mottles.

This soil is low in natural fertility and organic matter. It is very strongly acid or strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and available water capacity is low. Runoff is slow. Tilth is good. The root zone is deep; however, from mid winter to mid spring the water table commonly is at a depth of 0.5 foot to 1.5 feet and limits root penetration.

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

This Pelham soil is poorly suited to cultivated crops because of wetness and flooding. It is moderately suited to pasture.

This soil is well suited to slash pine and loblolly pine. Wetness is the main limitation to equipment use in managing and harvesting the tree crop. The equipment can be used during the drier seasons.

This soil is poorly suited to most urban and recreation uses because of wetness and flooding. Unless outlets are available for drainage, overcoming these limitations is difficult.

This map unit is in capability subclass Vw and woodland suitability group 2w.

Ra—Rains loamy fine sand. This deep, poorly drained, nearly level soil is in smooth areas and in slight depressions on terraces near the larger streams. Slope is 0 to 2 percent. Areas are 5 to 50 acres.

Typically, the surface layer is dark gray loamy fine sand about 5 inches thick. The subsurface layer is grayish brown loamy fine sand to a depth of 12 inches. The subsoil is mainly sandy clay loam and extends to a depth of 65 inches or more. It is gray throughout and has yellowish brown, yellowish red, and brownish yellow mottles.

This soil is low in natural fertility and organic matter. It is very strongly acid or strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and available water capacity is medium. Runoff is slow. Tilth is good. The root zone is deep; however, from late fall to mid spring the water table commonly is at a depth of less than 1 foot and limits the depth of root penetration.

Included in mapping are a few small areas of Ocilla soils.

Most of the acreage of this Rains soil is wooded. This soil is poorly suited to cultivated crops and pasture because of wetness.

This soil is well suited to slash pine, loblolly pine, and sweetgum. Wetness is a limitation to equipment use in managing and harvesting the tree crop. However, logging can be done during the drier seasons. Drainage is needed to overcome seedling mortality.

This soil is poorly suited to urban and recreation uses because of wetness. Unless outlets are available for drainage, overcoming this limitation is difficult.

This map unit is in capability subclass IVw and woodland suitability group 2w.

Se—Stilson loamy sand. This deep, moderately well drained, nearly level soil is in smooth, low lying areas on uplands. Slope is 0 to 2 percent. Areas are 5 to 30 acres.

Typically, the surface layer is dark grayish brown loamy sand about 6 inches thick. The subsurface layer is light yellowish brown loamy sand to a depth of 25 inches. The subsoil extends to a depth of 65 inches or more. The upper few inches of the subsoil is light

yellowish brown sandy loam, and the rest of the subsoil is dominantly brownish yellow sandy clay loam that has light gray, light brownish gray, yellowish brown, yellowish red, and strong brown mottles. Plinthite makes up about 8 percent of the lower part of the subsoil, below a depth of about 38 inches.

This soil is low in natural fertility and organic matter. It is very strongly acid or strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and available water capacity is low. Runoff is slow. Tilth is good. The soil can be worked throughout a wide range in moisture content. The root zone is deep and is easily penetrated by the roots.

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

This Stilson soil is only moderately suited to corn, tobacco, peanuts, soybeans, truck crops, hay, and pasture because of wetness. During dry seasons, high yields can be obtained by irrigating.

This soil is moderately suited to slash pine and loblolly pine. Wetness is the main limitation to equipment use in managing and harvesting the tree crop. The equipment can be used during the drier seasons.

This soil is only moderately suited to most urban uses because of wetness. This limitation commonly can be reduced by drainage. This soil is only moderately suited to recreation development because of its sandiness.

This map unit is in capability subclass IIw and woodland suitability group 2w.

StD2—Sunsweet gravelly sandy loam, 5 to 12 percent slopes, eroded. This deep, well drained, gently sloping and sloping soil is on hillsides, narrow ridgetops, and knolls on uplands. The surface layer is a mixture of the original surface soil and the upper part of the subsoil. Slopes are short and irregular. They are characterized by rills and galled spots. In places, they are gullied. Areas are 5 to 25 acres.

Typically, the surface layer is dark grayish brown gravelly sandy loam about 4 inches thick. The subsoil is sandy clay and extends to a depth of 66 inches or more. The upper part of the subsoil is mainly strong brown and has red and yellowish brown mottles, and the rest of the subsoil is mottled yellowish brown, dark red, and light gray. Plinthite makes up 5 to 15 percent of the subsoil, below a depth of about 9 inches.

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderately slow, and available water capacity is low. Runoff is rapid. Tilth is fair. The root zone is restricted because of the firm and clayey subsoil.

Included in mapping are small areas of Carnegie and Cowarts soils. Also included are several eroded areas in which the surface layer is sandy clay loam.

This Sunsweet soil is poorly suited to row crops, small grain, hay, and pasture. It is limited for use as cropland, hayland, and pasture because of the irregular landscape, rapid runoff, and a severe erosion hazard.

This soil is well suited to slash pine and loblolly pine. The clay in the upper part of this soil limits the use of equipment and causes seedling mortality.

This soil is only moderately suited to most urban and recreation uses because of slope. The moderately slow permeability of the subsoil further limits this soil for use as septic tank absorption fields.

This map unit is in capability subclass VIe and woodland suitability group 3c.

SuB—Susquehanna sandy loam, 2 to 5 percent slopes. This deep, somewhat poorly drained, very gently sloping soil is on ridgetops on uplands. Slopes commonly are smooth and undulating. Areas are 4 to 15 acres.

Typically, the surface layer is dark grayish brown sandy loam about 6 inches thick. The subsoil is clay and extends to a depth of 84 inches or more. The upper few inches of the subsoil is yellowish red and has strong brown and light gray mottles; the middle part is mottled light brownish gray, strong brown, and red; and the lower part is light gray and has red and strong brown mottles.

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is very slow, and available water capacity is medium. Runoff is moderate. Tilth is fair. The root zone is somewhat restricted by the very firm and clayey subsoil.

Included in mapping are areas of Esto and Cowarts soils. In some places the surface layer is sandy clay loam.

This Susquehanna soil is poorly suited to row crops and small grain because the subsoil is clayey and very firm and the erosion hazard is severe. This soil is moderately suited to hay and pasture.

This soil is moderately suited to loblolly pine. The clay in the upper part of the soil limits the use of equipment.

This soil is poorly suited to most urban uses. The very slow permeability of the subsoil limits this soil for use as septic tank absorption fields. The high shrink-swell potential limits it for use as a building site. This soil is moderately suited to recreation development because of the very slow permeability and wetness.

This map unit is in capability subclass IVe and woodland suitability group 3c.

TfA—Tifton loamy sand, 0 to 2 percent slopes. This deep, well drained, nearly level soil is on ridgetops on uplands. Areas are 5 to 80 acres.

Typically, the surface layer is dark grayish brown loamy sand about 10 inches thick. The subsoil is dominantly sandy clay loam and extends to a depth of 65 inches or more. It is strong brown throughout except that it also has red and gray mottles in the lower part. Plinthite makes up 8 to 15 percent of the lower part of the subsoil, below a depth of about 35 inches. Many nodules of ironstone are on the surface and in the upper part of the profile.

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and available water capacity is medium. Tilth is good, and the soil can be worked throughout a wide range in moisture content. The root zone is deep and is easily penetrated by the roots.

Included in mapping are a few small areas of Dothan and Fuquay soils. Wet areas smaller than three acres, indicated by a wet spot symbol on the map, are included also.

This Tifton soil is well suited to row crops, small grains, hay, and pasture (fig. 2 and 3). During dry seasons, high yields can be obtained by irrigating. Conservation tillage and the use of cover crops, including grasses and legumes, in the cropping system help maintain the content of organic matter.

This soil is well suited to loblolly pine and slash pine. There are no limitations to woodland use.

This soil is well suited to most urban and recreation uses. However, the moderate permeability of the subsoil limits this soil for use as septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation.

This map unit is in capability class I and woodland suitability group 2o.

TfB—Tifton loamy sand, 2 to 5 percent slopes. This deep, well drained, very gently sloping soil is on ridgetops and hillsides on uplands. Slopes commonly are smooth and convex. Areas are 5 to 150 acres.

Typically, the surface layer is dark grayish brown loamy sand about 10 inches thick. The subsoil is dominantly sandy clay loam and extends to a depth of 72 inches or more. The upper part of the subsoil is yellowish brown, and the lower part is mottled yellowish brown, red, olive yellow, and light gray. Plinthite makes up 10 to 15 percent of the lower part of the subsoil, below a depth of about 29 inches. Many nodules of ironstone are on the surface and in the upper part of the profile.

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and available water capacity is medium. Runoff is moderate. Tilth is good. This soil can be worked throughout a wide range in moisture content. The root zone is deep and is easily penetrated by the roots.

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

This Tifton soil is well suited to row crops, small grains, hay, and pasture (fig. 4 and 5). During dry seasons, high yields can be obtained by irrigating. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a moderate hazard if cultivated crops are grown. Conservation tillage and the use of cover crops, including grasses and legumes, in the cropping system help reduce runoff and control erosion.

This soil is well suited to loblolly pine and slash pine. There are no limitations to woodland use or management.

This soil is well suited to most urban and recreation uses (fig. 6). However, the moderate permeability of the subsoil limits this soil for use as septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation.

This map unit is in capability subclass IIe and woodland suitability group 2o.

TsC2—Tifton sandy loam, 5 to 8 percent slopes, eroded. This deep, well drained, gently sloping soil is on hillsides on uplands. The surface layer is a mixture of the original surface soil and the upper part of the subsoil. In most places, slopes are irregular. These slopes commonly contain rills and galled spots and in places are gullied. Areas are 4 to 15 acres.

Typically, the surface layer is dark grayish brown sandy loam about 6 inches thick. The subsoil is dominantly 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 strong brown and red mottles; and the lower part is mottled strong brown, red, yellowish brown, and light gray. Plinthite makes up 8 to 15 percent of the lower part of the subsoil, below a depth of about 34 inches. Many nodules of ironstone are on the surface and in the upper part of the profile.

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and available water capacity is medium. Runoff is moderate. This soil has good tilth. The root zone is deep and is easily penetrated by the roots.

Included in mapping are a few areas of Carnegie and Cowarts soils. Also included are a few areas of Tifton soils that have a surface layer of loamy sand.

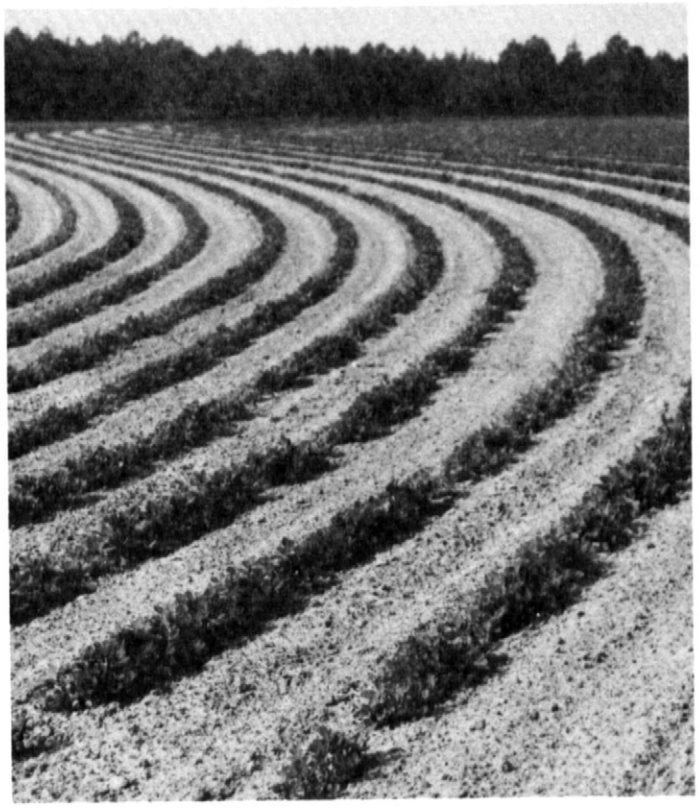
This Tifton soil is only moderately suited to row crops and small grain because of the irregular, somewhat gullied landscape. It is well suited to hay and pasture. Good tilth can be maintained by returning crop residue to the soil. Erosion is a severe hazard if cultivated crops are grown. Conservation tillage and the use of cover crops, including grasses and legumes, in the cropping system help reduce runoff and control erosion.

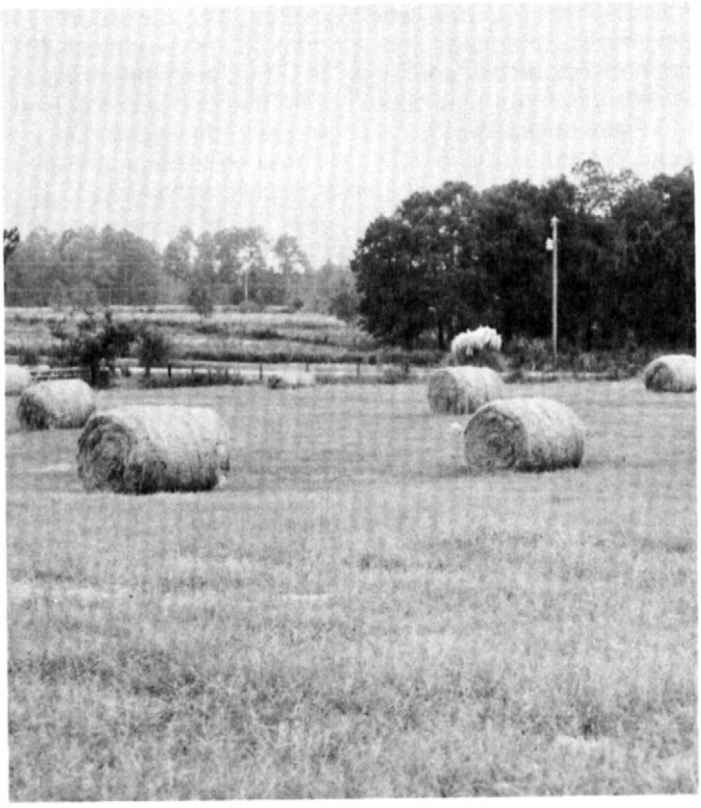
This soil is well suited to loblolly pine and slash pine. There are no significant limitations to woodland use or management.

This soil is well suited to most urban uses. However, the moderate permeability of the subsoil limits this soil for use as septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation.

This map unit is in capability subclass IIIe and woodland suitability group 2o.

The peanuts and corn in figure 2 (top) and the tobacco in figure 3 (bottom) are on Tifton loamy sand, 0 to 2 percent slopes. This soil is prime farmland and is well suited to the commonly grown crops.





The peanuts in figure 4 (top, left), the improved bermudagrass hay in figure 5 (top, right), and the golf fairway in figure 6 (bottom) are on Tifton loamy sand, 2 to 5 percent slopes.

TuB—Tifton-Urban land complex, 0 to 5 percent slopes. This complex consists of areas of deep, well drained Tifton soils and areas of Urban land that are so intermingled that they could not be mapped separately at the scale selected. It is on ridgetops and hillsides. On some ridgetops it is nearly level, and on other ridgetops and on hillsides it is very gently sloping. Areas are 15 to 200 acres.

Tifton loamy sand makes up about 50 percent of each mapped area. Typically, the surface layer is dark grayish brown loamy sand about 10 inches thick. The subsoil is dominantly sandy clay loam that extends to a depth of 72 inches or more. The upper part of the subsoil is yellowish brown, and the lower part is mottled red, yellowish brown, olive yellow, and light gray. Plinthite makes up 10 to 15 percent of the lower part of the subsoil, below a depth of about 39 inches. Many nodules of ironstone are on the surface and in the upper part of the profile.

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and available water capacity is medium. Runoff is moderate. Tilth is good. This soil can be worked throughout a wide range in moisture content. The root zone is deep and is easily penetrated by the roots.

Urban land makes up about 40 percent of each mapped area. Most of this land is covered by shopping centers, schools, parking lots, streets, industrial and commercial buildings, and private dwellings. The original soil material has been altered by cutting, filling, and shaping.

Although this complex is used primarily for urban purposes, it is well suited to gardens, shrubs, shade trees, and lawns.

The soil in this complex is well suited to most urban and recreation uses. However, the moderate permeability of the subsoil limits this soil for use as septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation.

The Tifton soil is in capability subclass IIe. It is not assigned to a woodland suitability group.

Important farmland

This section gives the extent and location of the land in Tift County that is important for producing food, feed, fiber, forage, and oilseed crops.

Prime farmland

Prime farmland, as defined by.the U.S. Department of Agriculture, is that land that is best suited to producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to economically produce sustained high crop yields if acceptable farming methods are used. Prime farmland produces the highest yields with minimal inputs of energy and money, and farming it results in the least damage to the environment. Prime farmland is of major importance in satisfying the nation's short- and long-range needs for food and fiber. The supply of high quality farmland is limited, and it should be used with wisdom and foresight.

Prime farmland is either currently used for producing food or fiber or is available for this use. Urban or built-up land or water areas are not included. Urban and built-up land includes any unit of land of 10 acres or more in size that is used for residences, industrial sites, commercial sites, construction sites, institutional sites, railroad yards, small parks, cemeteries, airports, golf courses, sanitary landfills, sewage treatment plants, water-control structures and spillways, shooting ranges, and so forth.

Prime farmland usually has an adequate and dependable supply of moisture from precipitation or irrigation. It has favorable temperature and growing season and acceptable reaction. It has few or no rocks and is permeable to water and air. Prime farmland is not excessively erodible or saturated with water for long periods or frequently flooded during the growing season. Slope ranges mainly from 0 to 6 percent.

In Tift County, 81,560 acres, or 48 percent of the county, meets the soil requirements for prime farmland. Areas are scattered throughout the county but most are in map units 5 and 6 on the general soil map. The main crops grown on the prime farmland are corn, soybeans, and peanuts.

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 marginal land.

The map units that make up prime farmland in Tift County, and their extent, 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 use and management of the soils is described in the section "Detailed soil map units."

Additional farmland of statewide importance

In Tift County, 20,150 acres is marginal cropland. This farmland consists of soils that are important to agriculture 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, usually, less productive than prime farmland soils. The slope is 8 percent or less.

The map units that make up this additional important farmland, and their extent, are listed in table 5. The location of each map unit is shown on the detailed soil maps at the back of this publication. The use and management of the soils is described in the section "Detailed soil map units."

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 potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

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

Information in this section can be used to plan the use and management of soils for crops and pasture; as 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 potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

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

Contractors can use this survey to locate sources of sand 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

James E. Helm, conservation agronomist, Soil Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils 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.

Erosion is a major concern on most of the soils used for cropland and pasture in Tift County. If slope is more than 2 percent, erosion is a hazard. Carnegie, Cowarts, Dothan, Esto, Susquehanna, and Tifton soils, for example, have slope of 2 to 5 percent.

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, which is difficult to till. Carnegie, Esto, Sunsweet, and Susquehanna soils are examples. Tillage or preparation of a good seedbed is difficult on the eroded spots common in areas of eroded Carnegie, Cowarts, Sunsweet, and Tifton soils. Erosion also reduces productivity on soils that tend to be droughty, for example, Fuquay 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.

A cropping system that keeps plant cover on the soil for extended periods will aid in maintaining the productive capacity of the soils. On livestock farms the grass forage crops in the cropping system reduce erosion on sloping land and improve the tilth of the soil for the following crop.

Conservation tillage that leaves adequate amounts of crop residue on the surface increases infiltration and reduces runoff and erosion. This practice can be used on most of the soils in the survey area. No-tillage for corn, use of which is increasing, reduces erosion on the more sloping land and can be adapted to most soils in the county.

Terraces and diversions reduce the length of slope, reduce runoff, and control gully erosion. They are most practical on deep, well drained soils that have regular slopes. Carnegie, Cowarts, Dothan, Esto, and Tifton soils are suitable for terraces.

Contouring is a widely used erosion-control practice in the county. It is most effective on soils that have smooth, uniform slopes, including most areas of the very gently sloping and gently sloping Carnegie, Cowarts, Dothan, Esto, and Tifton soils.

Soil blowing is a concern on the sandy Lakeland and Kershaw 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.

Drainage is a major management need on most of the seasonally wet soils used for crops and pasture in Tift County. Some of the seasonally wet soils are so wet that production of crops common in the survey area is generally not possible. These are the poorly drained Alapaha, Grady, Kinston, Mascotte, Olustee, Osier, Pelham, and Rains soils. Most of the land is wooded.

Unless artificially drained, the somewhat poorly drained soils are so wet that crops are damaged during most years. In this category are the Albany, Ardilla, Leefield, and Ocilla soils. Clarendon and Stilson soils are moderately well drained, but they also need artificial drainage in most years.

The design of both surface and subsurface drainage systems varies with the kind of soil. A combination of surface drainage and tile drainage is needed in most areas of poorly drained soils before they can be used for intensive row cropping. Drains have to be more closely spaced in slowly permeable soils than in more permeable soils. Tile drainage is very slow in Grady and Rains soils. Finding adequate outlets for tile drainage systems is difficult in many areas of Alapaha, Grady, Pelham, and Rains soils.

Fertility is naturally low in most of the soils in the survey area. The poorly drained soils in depressions on uplands, along drainageways, and on flood plains, such as Alapaha, Grady, Kinston, Osier, Pelham, and Rains soils, have slightly more organic matter than most of the well drained soils on uplands.

All of the soils are naturally acid. Therefore, 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 for good growth of clover and other crops that grow on nearly neutral soils. Available phosphorus and potash levels are naturally low in most of these soils. On all soils, additions of lime and fertilizer should be based on the results of soils 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. Circular 639 (*3*) of the University of Georgia College of Agriculture provides general recommendations for fertilizing field crops.

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

Most of the soils used for crops in the county have a surface layer of loamy sand that is low in organic matter. Tilth is generally good except in areas of the eroded Carnegie, Cowarts, Sunsweet, and Tifton soils, where the subsoil is exposed. Regular additions of crop residue, manure, and other organic material help improve or maintain tilth.

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

The soils and climate of Tift County are suited to many field crops. Corn, peanuts, soybeans, cotton, tobacco, and grain sorghum are commonly grown. Sunflowers, navy beans, sugar beets, and similar crops can be grown.

Rye, oats, and wheat are the common close-grown crops. Barley could be grown, and bahiagrass, tall fescue, crimson clover, and arrowleaf clover could be grown for seed.

Special crops grown commercially in the county are watermelons, cantaloupe, vegetables, pecans, peaches, sunflower, blueberries, and nursery plants. Field peas, butter beans, turnips, collards, mustard, English peas, tomatoes, sweet potatoes, Irish potatoes, okra, sweet corn, and cabbage are the common vegetable crops.

Deep soils that have good natural drainage and that warm up early in spring are especially well suited to many vegetables and small fruits. Carnegie, Cowarts, Dothan, and Tifton soils that have slopes of less than 5 percent are examples. If irrigated, Fuquay and Lakeland soils that have slopes of less than 5 percent also are well suited to vegetables and small fruits. Crops can generally be planted and harvested earlier on all of these soils than on the other soils in the county.

If excess water is removed, the moderately well drained Clarendon and Stilson soils are well suited to a wide range of vegetables.

Most of the well drained soils in the survey area 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.

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.

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.

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.

Land capability classification

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

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

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

Class I soils have slight limitations that restrict their use.

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

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

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

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

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

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

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

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

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 prepare this section.

The native vegetation of Tift County once included extensive stands of longleaf and slash pine, mixed with some hardwoods. In 1971, the Forest Service reported that the county's major forest type was still longleaf and slash pine but that only about 43 percent of the county was commercial forest land (*10*).

In the period 1970 to 1971, land use changes significantly reduced the amount of commercial forest land in Georgia. In Tift County and southwest Georgia, the area in commercial forest land decreased almost 6 percent from 1960 to 1971, compared to a decrease of 1 to 2 percent over central and north Georgia. A large part of this forest land was cleared for agriculture, and most of the rest was cleared for urban development.

In addition to the longleaf-slash pine forest type, oak-pine and oak-gum-cypress are significant forest types in Tift County. Oak-pine and pure pine forests account for two-thirds of the commercial forest land in the county.

In spite of the significant changes in land use, the growing stock in Tift County is increasing. The growth potential of the woodland in Tift County is more fully utilized than in most of the rest of the state. Only about 10 percent of the commercial forest land in the county would be described as non-stocked or poorly stocked, compared to 33 percent for southwest Georgia as a whole. Most of the land in the county where stocking rates can be improved is in farm and miscellaneous private ownership. The attractive price structure for forest products in the area, together with available technical and financial assistance, can further improve stocking rates.

A number of soils in the county can be identified as important for growing trees. The well drained Carnegie, Cowarts, Dothan, and Tifton soils in the higher lying areas are most often associated with pure pine forest types. The moderately well-drained Clarendon and Stilson soils and the poorly drained Pelham and Rains soils support pure pine and mixed pine, as well as pure hardwood stands. The flood plain soils, such as Alapaha, Kinston, and Osier soils commonly support hardwoods such as oak, gum, and cypress.

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

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

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

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

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

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

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

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

Recreation

The survey area is suited to many types of recreation. It is only necessary to find the best uses for each kind of soil.

The Alapaha, Little, and New Rivers as well as the many farm ponds are suitable for fishing and boating. The flood plains along the streams are well suited to nature study, hunting, and similar activities. The well drained, very gently sloping Carnegie and Cowarts soils and nearly level and very gently sloping Dothan and Tifton soils, which commonly are on ridgetops, are well suited to playgrounds. The very gentle slopes can be leveled and smoothed for ballfields and tennis courts. Most of the well drained, nearly level to gently sloping soils are well suited to campsites and picnic areas. The gently sloping Carnegie, Cowarts, Esto, and Sunsweet soils, on hillsides, are well suited to parks, paths and trails, golf courses, and nature study areas.

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

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

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

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface 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 or 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, horseback riding, and bicycling 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

Jesse Mercer, Jr., biologist, Soil Conservation Service, helped prepare this section.

The survey area takes in a variety of wildlife habitat. The woodland supports deer, squirrel, raccoon, opossum, many nongame animals, and songbirds. Mourning doves are abundant throughout the survey area. Many quail and rabbits are in cropland areas adjacent to suitable cover. Streams and impoundments provide habitat for waterfowl and other aquatic wildlife. Beaver ponds are especially attractive to wood ducks. The streams and more than 900 ponds support large populations of fish.

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

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

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

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

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, 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 fescue, lovegrass, bromegrass, 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, beggarweed, wheatgrass, and grama.

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, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse, seeds, and cones. 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, spruce, fir, cedar, and juniper.

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, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are 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, dove, 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, deer, and bear.

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

Engineering

Joe A. Stevens, Jr., assistant state conservation engineer, Soil Conservation Service, helped prepare this section.

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

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

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

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

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

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

performance of existing similar structures on the same or similar soils.

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

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

Building site development

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

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

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

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

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

Sanitary facilities

Table 12 shows the degree and the kind of soil limitations that affect septic tank absorption fields, 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 good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

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

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 is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be

unsaturated soil material beneath the absorption field to effectively filter the effluent. 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, a high water table, flooding, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of 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, a high water table, slope, and flooding affect both types of landfill. Texture, highly organic layers, and soil reaction affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

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

Soil texture, wetness, 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, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10 and 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 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, stones, or soluble salts, or soils that have slopes of 8 to 15 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, stones, 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 nutrients for plant growth.

Water management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and 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 for each soil the restrictive features that affect 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. 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 even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or organic matter. 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 depth to 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, permeability, erosion hazard, and slope. The performance of a system is affected by the soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across

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

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Wetness and slope affect the construction of grassed waterways. 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 (*9*). 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 a soil contains particles coarser than sand, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

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

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

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

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

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

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

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

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

Physical and chemical properties

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

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

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

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

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

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

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

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

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

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

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

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is 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 of the plow layer is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the

soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and water features

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

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

The four hydrologic soil groups are:

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

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

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

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

Flooding, the temporary inundation of an area, is caused by overflowing streams or runoff from adjacent slopes. Water standing for short periods after rainfall or snowmelt and water in swamps and marshes are not considered flooding.

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

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

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

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

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

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

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

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

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

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

Engineering index test data

Table 18 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are typical of the series and are described in the section "Soil series and their morphology." The soil samples were tested by 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 (*11*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. In table 19, the soils of the survey area are classified according to the system. 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 plain, plus *aquent*, the suborder of the Entisols that have an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not 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. The texture of the surface layer or of the substratum can differ within a series.

Soil series and their morphology

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

Characteristics of the soil and the material in which it formed are identified for each series. 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 (*7*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*11*). 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."

Alapaha series

The Alapaha series consists of deep, poorly drained soils that are moderately slowly permeable in the lower part of the subsoil. These soils formed in sandy and loamy marine sediment. They are along drainageways and in depressions. The water table is within 0.5 foot to 1.5 feet of the surface during winter and spring. Slope is 0 to 2 percent.

Alapaha soils are geographically closely associated with Ardilla, Leefield, and Stilson soils. Ardilla and Leefield soils are on somewhat higher lying landscapes and are somewhat poorly drained. Also, Ardilla soils

have an A horizon less than 20 inches thick, and they have fragic properties in 40 percent or more of the control section. Stilson soils are on higher lying landscapes and are moderately well drained.

Typical pedon of Alapaha loamy sand in a pasture 1.1 miles east of Mt. Calvary Church on county road, 0.3 mile southeast on county road, on west roadbank:

A1—0 to 6 inches; very dark gray (10YR 3/1) loamy sand; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; abrupt wavy boundary.

A21—6 to 12 inches; dark gray (10YR 4/1) loamy sand; few pockets of very dark gray (10YR 3/1); weak fine granular structure; common fine and medium roots; strongly acid; clear wavy boundary.

A22—12 to 30 inches; gray (10YR 5/1) loamy sand; weak fine granular structure; few medium roots; common clean sand grains; very strongly acid; clear wavy boundary.

B21tg—30 to 42 inches; gray (10YR 6/1) sandy clay loam; few sandy loam pockets; common medium distinct brownish yellow (10YR 6/6) mottles and few medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary.

B22t—42 to 65 inches; mottled yellowish brown (10YR 5/6), light gray (10YR 7/1), red (10YR 4/8), and strong brown (7.5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; firm; patchy clay films on faces of peds; about 10 percent plinthite; very strongly acid; gradual wavy boundary.

B23t—65 to 80 inches; mottled yellowish brown (10YR 5/6), strong brown (7.5YR 5/6), light gray (10YR 7/1), and red (10YR 4/8) sandy clay loam; moderate medium subangular blocky structure; firm; patchy clay films on faces of peds; about 10 percent plinthite; very strongly acid.

Solum thickness is 80 inches or more. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas.

The A horizon is 26 to 32 inches thick. The A1 horizon has hue of 10YR, value of 3 or 4, and chroma of 1, or it is neutral and has value of 3 or 4. The A2 horizon has hue of 10YR, value of 4 to 6, and chroma of 1.

The B1 horizon, if present, has hue of 10YR, value of 6 or 7, and chroma of 1.

The B21tg horizon has hue of 10YR, value of 6 or 7, and chroma of 1. It has common or many medium or coarse brown and red mottles.

The B22t horizon and B23t horizon are mottled in hue of 10R, value of 4, and chroma of 6 or 8; in hue of 2.5YR, value of 4 or 5, and chroma of 6; in hue of 7.5YR, value of 5, and chroma of 6 or 8; or in hue of 10YR and value of 5 and chroma of 6 or 8 or value of 6 or 7 and chroma of 1. The B22t horizon and the B23t horizon are about 10 percent plinthite.

Albany series

The Albany series consists of deep, somewhat poorly drained soils that are rapidly permeable in the surface layer and thick subsurface layer and moderately permeable in the subsoil. These soils formed in sandy and loamy marine sediment. They are on low lying uplands. The water table is at a depth of 1 foot to 2.5 feet during winter and early spring. Slope is 0 to 2 percent.

Albany soils are geographically closely associated with Lakeland, Ocilla, and Pelham soils. Lakeland soils do not have an argillic horizon and are on higher lying landscapes. Ocilla soils are arenic. Pelham soils are arenic and poorly drained and commonly are on lower lying landscapes.

Typical pedon of Albany sand in a cultivated field 1 mile west on U.S. Highway 82 from crossing with I-75, 0.4 mile south on county road, 900 feet southwest:

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

A21—6 to 23 inches; light yellowish brown (10YR 6/4) sand; few medium distinct yellowish brown (10YR 5/6) mottles; single grain; loose; common fine roots in upper part; strongly acid; clear wavy boundary.

A22—23 to 41 inches; light yellowish brown (10YR 6/4) sand; common medium distinct yellowish brown (10YR 5/6) and light gray (10YR 7/2) mottles; single grain; loose; very strongly acid; gradual wavy boundary.

A23—41 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 grain; loose; very strongly acid; gradual wavy boundary.

B21t—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; discontinuous clay films in some pores; few gray lenses of sand; very strongly acid; gradual wavy boundary.

B22t—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; patchy clay films on faces of peds; very strongly acid.

Solum thickness is 80 inches or more. The soils are very strongly acid or strongly acid throughout except for the surface layer in limed areas.

The A horizon is 40 to 55 inches thick. The A1 horizon or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 4, 6, or 8. It has few or common gray, yellow, or brown mottles.

The B1 horizon, if present, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 or 6.

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

Ardilla series

The Ardilla series consists of deep, somewhat poorly drained soils that are moderately permeable in the upper part of the subsoil and moderately slowly permeable in the lower part. These soils formed mainly in loamy marine sediment. They are on low lying uplands. The water table is at a depth of 1 foot to 2 feet from late fall to mid spring. Slope is 0 to 2 percent.

Ardilla soils are geographically closely associated with Alapaha, Dothan, and Tifton soils. Alapaha soils are arenic and poorly drained and commonly are on somewhat lower lying landscapes. Dothan and Tifton soils are well drained and commonly are on somewhat higher lying landscapes.

Typical pedon of Ardilla loamy sand in a cultivated field 1.5 miles west of Harding Church on county road, 1,500 feet south of road:

Ap—0 to 8 inches; very dark gray (10YR 3/1) loamy sand; weak fine granular structure; very friable; many fine roots; few nodules of ironstone; medium acid; abrupt wavy boundary.

A2—8 to 12 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable; many fine roots; few nodules of ironstone; medium acid; clear wavy boundary.

B1—12 to 17 inches; light yellowish brown (10YR 6/4) sandy loam; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; common fine roots; few nodules of ironstone; strongly acid; clear wavy boundary.

B21t—17 to 34 inches; yellowish brown (10YR 5/8) sandy clay loam; many medium distinct light gray (10YR 6/1) and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; patchy clay films on faces of peds; few nodules of ironstone; very strongly acid; clear wavy boundary.

B22t—34 to 46 inches; mottled yellowish brown (10YR 5/8), light gray (10YR 6/1), and yellowish red (5YR 4/8) sandy clay loam; weak medium subangular blocky structure; 40 to 45 percent, by volume, of the areas dominated by yellowish red are firm, brittle, and compact; the gray areas are friable; patchy clay films on faces of peds; few nodules of ironstone; about 6 percent plinthite; very strongly acid; gradual wavy boundary.

B23t—46 to 65 inches; reticulately mottled red (2.5YR 4/8), strong brown (7.5YR 5/6), light gray (10YR 6/1), and light yellowish brown (10YR 6/4) sandy clay loam; weak medium subangular blocky structure; about 40 to 45 percent, by volume, of the areas dominated by red and strong brown are firm, brittle, and compact; the gray areas are friable; patchy clay films on faces of peds; about 5 percent nodules of ironstone; about 12 percent plinthite; very strongly acid.

Solum thickness is 72 to 80 inches or more. The soils are strongly acid or very strongly acid throughout except for the surface layer in limed areas. Depth to horizons that are 5 percent or more plinthite is 28 to 48 inches.

The Ap horizon or A1 horizon is 6 to 8 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 1 or 2.

The A2 horizon is 4 to 8 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 2.

The B1 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4, 6, or 8.

The B21t horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4, 6, or 8. This horizon has common or many gray, yellow, yellowish red, or brown mottles.

The B22t horizon and B23t horizon commonly are mottled yellowish brown, gray, red, yellowish red, and strong brown. Content of plinthite ranges from 5 to 15 percent. Forty to fifty percent of the lower part of the Bt horizon is brittle.

Carnegie series

The Carnegie series consists of deep, well drained, moderately permeable soils that formed in loamy and clayey marine sediment on uplands. Slope is 3 to 8 percent.

Carnegie soils are geographically closely associated with Sunsweet and Tifton soils. Sunsweet soils have plinthite above a depth of 15 inches. Tifton soils commonly are on smoother topography, are in a fine-loamy family, and are 5 percent or more plinthite below a depth of 30 to 50 inches.

Typical pedon of Carnegie sandy loam, 5 to 8 percent slopes, eroded, in a pasture 3.5 miles southeast of Whiddons Mill Pond, east side of paved road:

Apcn—0 to 5 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; many fine roots; many nodules of ironstone 0.12 to 0.50 inch in diameter; strongly acid; abrupt wavy boundary.

B21tcn—5 to 19 inches; strong brown (7.5YR 5/6) sandy clay; moderate medium subangular blocky structure; friable; common fine roots in upper part; patchy clay films on faces of peds; common nodules of ironstone; very strongly acid; gradual wavy boundary.

B22t—19 to 35 inches; strong brown (7.5YR 5/6) sandy clay; common medium distinct red (10R 4/8) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine roots; thin patchy clay films on faces of peds; few nodules of ironstone; about 8 percent nodular plinthite; very strongly acid; gradual wavy boundary.

B23t—35 to 46 inches; mottled yellowish brown (10YR 5/6), red (10R 4/6), and yellowish red (5YR 5/6) sandy clay; moderate medium subangular blocky structure; firm; patchy clay films on faces of peds; about 10 percent nodular plinthite; very strongly acid; gradual wavy boundary.

B24t—46 to 65 inches; coarsely mottled strong brown (7.5YR 5/6), red (2.5YR 4/6), light gray (10YR 7/1), and yellowish brown (10YR 5/6) sandy clay; moderate medium subangular blocky structure; firm; patchy clay films on faces of peds; 8 percent plinthite; very strongly acid.

Solum thickness is 61 inches or more. The soil is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Depth to horizons that are 5 percent or more plinthite is 18 to 22 inches.

The A horizon is 4 to 8 inches thick. The Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. Nodules of ironstone make up 5 to 15 percent, by volume, of the horizon.

The Bt horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 6 or 8. The middle part of the Bt horizon has many medium and coarse red, gray, yellow, or brown mottles. The lower part of the Bt horizon is mottled red, gray, yellow, or brown. The gray mottles do not represent wetness. Nodules of ironstone make up 5 to 10 percent of the horizon. Plinthite content ranges from 5 to 12 percent between depths of 19 and 61 or more inches.

Clarendon series

The Clarendon series consists of deep, moderately well drained soils that are moderately permeable in the upper part of the subsoil and moderately slowly permeable in the lower part. These soils formed mainly in loamy marine sediment and are on low-lying uplands. The water table is about 1.5 to 2.5 feet below the surface in winter and early spring. Slope is 0 to 2 percent.

Clarendon soils are geographically closely associated with Alapaha, Leefield, and Stilson soils. The associated soils are arenic. Alapaha soils are poorly drained and are in depressions and along drainageways. Leefield soils are somewhat poorly drained and commonly are on somewhat lower lying landscapes.

Typical pedon of Clarendon loamy sand in a cultivated field 1.6 miles west on county road from Harding Church, 1,500 feet south of road:

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

B1—8 to 14 inches; light yellowish brown (10YR 6/4) sandy loam; weak fine subangular blocky structure; friable; common fine roots; few nodules of ironstone; strongly acid; clear wavy boundary.

B21t—14 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 nodules of ironstone; few patchy clay films on faces of peds and in pores; strongly acid; gradual wavy boundary.

B22t—24 to 40 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct gray (10YR 6/1), yellowish red (5YR 4/8), and strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; few nodules of ironstone; patchy clay films on faces of peds and in pores; about 5 percent plinthite; very strongly acid; gradual wavy boundary.

B23t—40 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; few patchy clay films on faces of peds and in pores; about 10 percent plinthite; very strongly acid; gradual wavy boundary.

Solum thickness is 60 to 70 inches or more. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas.

The A horizon is 7 to 12 inches thick. The Ap horizon has hue of 10YR, value of 4, and chroma of 1 or 2. The A2 horizon, if present, has hue of 10YR, value of 6, and chroma of 3 or 4. The A horizon has few or common nodules of ironstone.

The B1 horizon has hue of 10YR, value of 5 or 6, and chroma of 4 or 6.

The upper part of the Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 4 or 6. It has red, brown, or gray mottles. The lower part is mottled red, brown, yellow, or gray; the grayish mottles are at a depth of 20 to 30 inches. Plinthite content ranges from 5 to 15 percent, but the plinthite is mostly in the lower part. This horizon commonly is sandy clay loam, but some pedons have a thin subhorizon that is sandy loam or sandy clay.

Cowarts series

The Cowarts series consists of deep, well drained soils that have moderate permeability in the subsoil and slow permeability in the substratum. These soils formed in mostly loamy marine sediment on uplands. Slope is 2 to 12 percent.

Cowarts soils are geographically closely associated with Carnegie and Esto soils. Carnegie and Esto soils are in a clayey family and have a thicker solum than Cowarts soils. In addition, Carnegie soils are more than 5 percent nodules of ironstone in the A horizon and in the upper part of the Bt horizon.

Typical pedon of Cowarts sandy loam, 5 to 8 percent slopes, eroded, 1,200 feet west on Brighton Road from I-75 exit, 40 feet north of road:

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; very friable; many fine roots; few nodules of ironstone; few quartz pebbles; strongly acid; abrupt wavy boundary.

B21t—5 to 20 inches; yellowish brown (10YR 5/4) sandy clay loam; weak medium subangular blocky structure; friable; common fine roots; few patchy clay films on faces of peds; few nodules of ironstone; few quartz pebbles; strongly acid; clear wavy boundary.

B22t—20 to 26 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct yellowish red (5YR 4/8) mottles; common medium prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; firm; few patchy clay films on faces of peds; about 3 percent plinthite; few nodules of ironstone; strongly acid; gradual wavy boundary.

C1—26 to 62 inches; mottled yellowish brown (10YR 5/6), red (2.5YR 4/8), light gray (10YR 7/1), and strong brown (7.5YR 5/6) sandy clay loam that has sandy loam strata; massive; firm and compact; very strongly acid; gradual wavy boundary.

Solum thickness is 20 to 40 inches. The soil is strongly acid or very strongly acid throughout except for the surface layer in limed areas.

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. The A2 horizon, if present, has hue of 10YR, value of 6, and chroma of 3 or 4 or it is 2.5Y 5/2. Nodules of ironstone make up 2 to 4 percent of the A horizon. The A horizon is loamy sand or sandy loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4, 6, or 8. The lower part of the Bt horizon has many medium or coarse red, yellow, or brown mottles. If present, nodules of ironstone make up to 3 percent of the upper part of the subsoil.

The C horizon is mottled in hue of 10R, 5YR, and 10YR, value of 4 to 8, and chroma of 1 to 4, 6, or 8 and in hue of 2.5YR and 7.5YR, value of 4 to 8, and chroma of 2, 4, 6, or 8. This horizon is sandy clay loam or sandy loam. Commonly, pockets or layers of loamy sand and sandy clay are present.

Dothan series

The Dothan series consists of deep, well drained soils that are moderately permeable in the upper part of the subsoil and moderately slowly permeable in the lower part. These soils formed in mostly loamy marine sediment. Dothan soils are on uplands of the Southern Coastal Plain. Slope is 0 to 5 percent.

Dothan soils are goegraphically closely associated with Fuquay, Stilson, and Tifton soils. Fuquay and Stilson soils are arenic, but Stilson soils have mottles of chroma of 2 or less between a depth of 30 and 40 inches, and they are lower lying on the landscape. Tifton soils commonly have more nodules of ironstone throughout.

Typical pedon of Dothan loamy sand, 2 to 5 percent slopes, in a cultivated field 0.6 mile west of Ty Ty on U.S. Highway 82, 650 feet north:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable; many fine roots; few nodules of ironstone; medium acid; abrupt smooth boundary.

B1—9 to 13 inches; yellowish brown (10YR 5/6) sandy loam; weak fine subangular blocky structure; friable; common fine roots; few nodules of ironstone; strongly acid; clear wavy boundary.

B21t—13 to 37 inches; yellowish brown (10YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable; few fine roots and pores; few clean sand grains; few nodules of ironstone; thin patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

B22t—37 to 44 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium prominent red (2.5YR 4/6) mottles and common medium distinct very pale brown (10YR 7/3) and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable; common fine pores; thin patchy clay films on faces of peds; 8 percent plinthite; very strongly acid; gradual wavy boundary.

B23t—44 to 74 inches; coarsely mottled yellowish brown (10YR 5/6), white (10YR 8/2), red (2.5YR 4/6), and strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; compact in place; common fine pores; thin patchy clay films on faces of peds; 6 percent plinthite; very strongly acid.

Solum thickness is 60 to 72 inches or more. The soil is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Depth to horizons that have plinthite content of 5 to 15 percent ranges from 32 to 44 inches.

The A horizon is 8 to 15 inches thick. The Ap horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2. The A2 horizon, if present, 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. Nodules of ironstone make up 2 to 4 percent, by volume, of the A horizon.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 6 or 8. It is dominantly sandy clay loam but ranges to sandy loam. The lower part of the Bt horizon includes many medium and coarse brown, yellow, red, white, and gray mottles. Nodules of ironstone make up less than 5 percent of the upper part of the Bt horizon.

Esto series

The Esto series consists of deep, well drained, slowly permeable soils that formed in dominantly clayey marine sediment. Esto soils are on uplands. Slope is 2 to 8 percent.

Esto soils are geographically closely associated with Carnegie, Cowarts, and Susquehanna soils. Carnegie soils have a subsoil that is 5 percent or more plinthite below a depth of about 18 inches. Cowarts soils are in a fine-loamy family and have a thinner solum. Susquehanna soils have a subsoil that is very firm, very sticky, and very plastic.

Typical pedon of Esto sandy loam, 2 to 5 percent slopes, in a pasture 0.7 mile southeast of Hillsdale on county road, 0.4 mile north of railroad tracks near county road, 500 feet east of road:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) sandy loam; moderate medium granular structure; friable; many fine roots; strongly acid; abrupt wavy boundary.

B1—6 to 12 inches; strong brown (7.5YR 5/6) sandy clay; common medium distinct yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; firm; common fine roots; few thin patchy clay films on faces of peds; very strongly acid; clear wavy boundary.

B21t—12 to 18 inches; yellowish red (5YR 5/8) clay; few medium distinct brownish yellow (10YR 6/6) mottles; strong medium subangular blocky structure; firm; common fine roots; patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

B22t—18 to 38 inches; mottled yellowish red (5YR 5/8), brownish yellow (10YR 6/6), and light gray (10YR 6/1) clay; strong medium subangular blocky structure; firm; patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

B23t—38 to 65 inches; mottled light gray (10YR 6/1), red (2.5YR 4/6), brownish yellow (10YR 6/6), and strong brown (7.5YR 5/6) clay; strong medium subangular blocky structure; firm; patchy clay films on faces of peds; 2 percent plinthite; very strongly acid.

Solum thickness is 60 to 72 inches or more. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas.

The A horizon is 4 to 9 inches thick. The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. If present, nodules of ironstone make up to 3 percent of the A horizon.

The B1 horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 or 6.

The Bt horizon is mottled in hue of 10YR, 5YR, and 10R, value of 4 to 6, and chroma of 1 to 4 or 6; in hue of 10YR and 5YR, value of 5 to 7, and chroma of 8; in hue of 10R, value of 4 to 6, and chroma of 8; or in hue of 7.5YR and 2.5YR, value of 4 to 6, and chroma of 2, 4, or 6. Some pedons have a matrix that has hue of 10YR or 5YR, value of 4 to 6, and chroma of 4 or 6 and many medium or coarse gray, red, yellow, and brown mottles. The Bt horizon is clay or sandy clay.

Fuquay series

The Fuquay series consists of deep, well drained soils that are moderately permeable in the upper part of the subsoil and slowly permeable in the lower part. These soils formed in sandy and loamy marine sediments on uplands. Slope is 0 to 5 percent.

Fuquay soils are geographically closely associated with Dothan, Lakeland, and Stilson soils. Dothan soils have an A horizon less than 20 inches thick. Lakeland soils are sandy throughout and do not have an argillic horizon. Stilson soils have chroma of 2 or less between depths of 20 to 40 inches, and they are lower lying on the landscape.

Typical pedon of Fuquay loamy sand, 0 to 5 percent slopes, in a pasture on Ponder Farm (Coastal Plain Experiment Station) 0.6 mile east on county road from Worth-Tift County Line, 1,200 feet north:

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

A2—10 to 32 inches; light yellowish brown (10YR 6/4) loamy sand; weak fine granular structure; very friable; many fine roots; few hard nodules of ironstone; very strongly acid; clear wavy boundary.

B1—32 to 40 inches; yellowish brown (10YR 5/6) sandy loam; weak fine subangular blocky structure; very friable; few fine roots; few hard nodules of ironstone; very strongly acid; clear wavy boundary.

B21t—40 to 46 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; few hard nodules of ironstone; common fine pores; few patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

B22t—46 to 54 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium prominent red (2.5YR 4/6) mottles; common medium distinct light gray (10YR 7/2) mottles; weak medium subangular blocky structure; firm; common fine pores; about 8 percent plinthite; few patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

B23t—54 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 inches plinthite; few patchy clay films on faces of peds; very strongly acid.

The solum is more than 80 inches thick. It is very strongly acid or strongly acid throughout except for the surface layer in limed areas.

The A horizon is 20 to 40 inches thick. If present, nodules of ironstone are few. The Ap horizon or A1 horizon has hue of 10YR, value of 4, and chroma of 1 or 2 or is 2.5Y 5/2. The A2 horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 4.

The B1 horizon has hue of 10YR, value of 5, and chroma of 6 or 8.

The Bt horizon has hue of 10YR, value of 5, and chroma of 4, 6, or 8 and hue of 10YR, value of 6, and chroma of 6. The lower part of the Bt horizon includes common medium and coarse brown, red, and gray mottles. Plinthite makes up 8 to 12 percent of the lower part of the Bt horizon. Few or common nodules of ironstone are in the upper part of the Bt horizon.

Grady series

The Grady series consists of deep, poorly drained, slowly permeable soils that formed in clayey marine sediment. Grady soils are in depressions on uplands. From winter to early summer the soil commonly is ponded or the water table is within 1 foot of the surface.

Grady soils are geographically closely associated with Clarendon, Dothan, Stilson, and Tifton soils. The well drained Dothan and Tifton soils and the moderately well drained Clarendon soils contain plinthite and are on higher lying landscapes than Grady soils. The moderately well drained Stilson soils are arenic and are also on the higher lying landscapes.

Typical pedon of Grady sandy loam on the agronomy farm of the Coastal Plain Experiment Station, 1,320 feet north of superintendent's office:

A1—0 to 8 inches; very dark gray (10YR 3/1) sandy loam; weak medium granular structure; very friable; many fine roots; very strongly acid; abrupt smooth boundary.

B1g—8 to 18 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.

B21tg—18 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 subangluar blocky structure; firm; common fine pores; patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

B22tg—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; patchy clay films on faces of peds; very strongly acid.

Solum thickness is 60 to 70 inches or more. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas.

The A horizon is 5 to 8 inches thick. The A1 horizon or A horizon has hue of 10YR, value of 2 or 3, and chroma of 1, or it is neutral and has value of 2 or 3.

The B1g horizon has hue of 10YR, value of 5 or 6, and chroma of 1. In some pedons, this horizon has few or common brown or gray mottles.

The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1. It has few to many brown, yellow, and red mottles. The Btg horizon is sandy clay or clay.

Kershaw series

The Kershaw series consists of deep, excessively drained, very rapidly permeable soils that formed in coarse sandy marine sediment. Kershaw soils are on uplands. Slope is 2 to 8 percent.

Kershaw soils are geographically closely associated with Pelham and Lakeland soils. Pelham soils are in drainageways and depressions, have an argillic horizon, and are poorly drained. Lakeland soils are 5 to 10 percent silt and clay in the control section.

Typical pedon of Kershaw coarse sand, 2 to 8 percent slopes, 2.2 miles northwest on county road from Whiddons Mill pond, 50 feet north of road:

A—0 to 3 inches; grayish brown (10YR 5/2) coarse sand; single grain; loose; many fine and medium roots; strongly acid; abrupt smooth boundary.

C&A—3 to 8 inches; yellowish brown (10YR 5/4) coarse sand; common medium distinct dark yellowish brown (10YR 4/4) mottles; single grain; loose; many fine and medium roots; strongly acid; clear wavy boundary.

C1—8 to 65 inches; yellowish brown (10YR 5/4) coarse sand; single grain; loose; few medium roots in upper part; very strongly acid; gradual wavy boundary.

C2—65 to 90 inches; yellow (10YR 7/6) coarse sand; single grain; loose; very strongly acid.

Thickness of the coarse sand ranges from 85 to 90 inches or more. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas.

The A1 horizon or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2.

The C&A horizon has hue of 10YR, value of 4 or 5, and chroma of 4 or 6.

The C horizon has hue of 10YR, value of 5 to 7, and chroma of 4 or 6. Some pedons have light gray or white mottles below a depth of 60 inches.

Kinston series

The Kinston series consists of deep, poorly drained, moderately permeable soils that formed in loamy alluvial sediment. Kinston soils are on flood plains. The water table commonly is 1 foot or less from the surface from late fall to early summer. Slope is 0 to 2 percent.

Kinston soils are geographically closely associated with Osier soils. Osier soils are Psamments.

Typical pedon of Kinston fine sandy loam in a wooded area of Kinston and Osier soils 0.2 mile west of Salem Church on county road, 60 feet north of road:

A1—0 to 6 inches; dark gray (10YR 4/1) fine sandy loam; moderate medium granular structure; friable; many fine and medium roots; strongly acid; abrupt wavy boundary.

B1g—6 to 16 inches; gray (10YR 5/1) fine sandy loam; few medium distinct very pale brown (10YR 7/3) mottles; weak medium subangular blocky structure; friable; common medium roots; strongly acid; clear wavy boundary.

B21g—16 to 43 inches; light gray (10YR 6/1) sandy clay loam; common medium distinct brownish yellow (10YR 6/6) mottles; massive in place parting to weak medium subangular blocky structure; firm; common medium roots; strongly acid; gradual wavy boundary.

B22g—43 to 60 inches; gray (10YR 5/1) sandy clay loam; common medium distinct light gray (10YR 7/1) mottles and few medium distinct yellowish brown (10YR 5/6) mottles; massive in place parting to weak medium subangular blocky structure; friable; strongly acid; gradual wavy boundary.

Solum thickness is 60 inches or more. The soil is strongly acid or very strongly acid throughout.

The A horizon is 4 to 6 inches thick. It has hue of 10YR, value of 4, and chroma of 1 or 2.

The B1g horizon has hue of 10YR or is neutral, value of 5 or 6, and chroma of 1 or 2.

The B2g horizon has hue of 10YR, value of 5 or 6, and chroma of 1. It is loam or sandy clay loam and has few to many gray, brown, and yellow mottles.

The C horizon, if present, is sandy loam or loamy sand. It commonly contains strata of coarse sand.

Lakeland series

The Lakeland series consists of deep, excessively drained, very rapidly permeable soils that formed in sandy marine, eolian, or fluvial sediment. Lakeland soils are on uplands. Slope is 0 to 8 percent.

Lakeland soils are geographically closely associated with Alapaha, Albany, Cowarts, and Fuquay soils. Alapaha soils are in drainageways and depressions, are arenic, and are poorly drained. Albany soils are on smoother, lower lying areas, are grossarenic, and are somewhat poorly drained. Cowarts and Fuquay soils are well drained and have an argillic horizon. In addition, Fuquay soils are arenic.

Typical pedon of Lakeland sand, 0 to 5 percent slopes, in woodland 1.1 miles east of Hickory Springs Church on county road, 1 mile south on county road, 1.1 miles southwest on county road to border of idle field:

A—0 to 4 inches; dark grayish brown (10YR 4/2) sand; single grain; loose; common clean uncoated white (10YR 8/1) sand grains; many fine roots; strongly acid; abrupt wavy boundary.

C1—4 to 7 inches; yellowish brown (10YR 5/4) sand; common yellowish brown (10YR 5/6) splotches; single grain; loose; few fine roots; few uncoated sand grains; very strongly acid; gradual wavy boundary.

C2—7 to 60 inches; yellowish brown (10YR 5/4) sand; single grain; loose; many uncoated sand grains; very strongly acid; gradual wavy boundary.

C3—60 to 85 inches; yellowish brown (10YR 5/6) sand; common medium faint very pale brown (10YR 7/3) mottles; single grain; loose; many uncoated sand grains; very strongly acid.

The sand is 80 to 86 or more inches thick. It is very strongly acid or strongly acid throughout except for the surface layer in limed areas.

The A horizon is 3 to 6 inches thick. The A1 horizon or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2.

The C horizon has hue of 10YR and value of 6 or 7 and chroma of 3, 4, or 6 or value of 5 and chroma of 4 or 6. Small pockets of light gray or white sand are below a depth of 40 inches in some pedons.

Leefield series

The Leefield series consists of deep, somewhat poorly drained soils that are moderately permeable in the upper part of the subsoil and moderately slowly permeable in the lower part. These soils formed in loamy and sandy marine sediments on low lying uplands. The water table is about 1.5 to 2.5 feet below the surface late in winter and early in spring. Slope is 0 to 3 percent.

Leefield soils are geographically closely associated with Alapaha, Fuquay, and Stilson soils. Alapaha soils are in lower lying depressions and drainageways and are poorly drained. Fuquay soils are on adjacent upland ridgetops and are well drained. Stilson soils are on somewhat higher landscapes and do not have chroma of 2 or less in the upper 30 inches.

Typical pedon of Leefield loamy sand in a wooded area 0.2 mile east of Mt. Calvary Church on county road, 1.3 miles north on county road, west road cut:

A1—0 to 6 inches; very dark gray (10YR 3/1) loamy sand; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt wavy boundary.

A2—6 to 25 inches; light brownish gray (2.5Y 6/2) loamy sand; few medium faint pale yellow mottles; weak fine granular structure; very friable; common fine and medium roots; very strongly acid; clear wavy boundary.

B1—25 to 30 inches; light yellowish brown (2.5Y 6/4) sandy loam; common medium distinct light gray (10YR 6/1) mottles; weak medium subangular

blocky structure; friable; very strongly acid; gradual wavy boundary.

B21t—30 to 38 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; sand grains coated and bridged with clay; few nodules of ironstone; very strongly acid; gradual wavy boundary.

B22t—38 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; sand grains coated and bridged with clay; few nodules of ironstone; about 5 percent plinthite; very strongly acid; gradual wavy boundary.

B23t—54 to 80 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; few thin patchy clay films on faces of peds; about 5 percent plinthite; very strongly acid.

Solum thickness is 80 inches or more. The soil is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Depth to horizons that are 5 percent or more plinthite is 38 to 48 inches.

The A horizon is 20 to 40 inches thick. The Ap horizon or A1 horizon is 6 to 12 inches thick and has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. The A2 horizon is 12 to 23 inches thick. It has hue of 2.5Y or 10YR, value of 5 or 6, and chroma of 2 and few or common gray, brown, or yellow mottles.

The B1 horizon has hue of 10YR or 2.5YR, value of 6, and chroma of 4. It has few or common light gray or brownish yellow mottles.

The B21t 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 yellow, brown, and gray mottles. In some pedons this horizon has a few nodules of ironstone.

The B22t horizon has hue of 10YR or 2.5Y, value of 6, and chroma of 4. It has many or common gray, red, or brown mottles.

The B23t horizon is mottled brown, yellow, red, or gray. Content of plinthite ranges from 5 to 12 percent. In some pedons this horizon has a few nodules of ironstone.

Mascotte series

The Mascotte series consists of deep, poorly drained, moderately permeable soils that formed in sandy and loamy marine sediments. These soils are in broad, smooth low-lying areas. The water table is within 1 foot of the surface in winter and spring. Slope is 0 to 2 percent.

The Mascotte soils are geographically closely associated with Alapaha and Olustee soils. Alapaha soils are on somewhat lower lying landscapes and they contain 5 percent or more plinthite in the lower part of the subsoil. Olustee soils commonly share the landscape with Mascotte soils, but they do not have an A2 horizon.

Typical pedon of Mascotte sand in an idle field 1.1 miles south of Mt. Olive Church on county road and U.S. Highway 319, 1.2 miles east on county road, 900 feet south:

A1—0 to 4 inches; very dark gray (10YR 3/1) sand; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear wavy boundary.

A2—4 to 10 inches; light gray (10YR 6/1) sand; few wormholes filled with very dark gray A1 material; single grain; loose; many fine and medium roots; very strongly acid; abrupt wavy boundary.

B21h—10 to 16 inches; dark reddish brown (5YR 3/2) sand; weak medium subangular blocky structure; firm; weakly cemented; few medium roots; many sand grains coated with organic matter; few clean sand grains; very strongly acid; clear wavy boundary.

B22h—16 to 20 inches; dark brown (7.5YR 4/4) sand; few medium distinct grayish brown (10YR 5/2) mottles; weak fine granular structure; friable; few medium roots; many sand grains thinly coated with organic matter; common uncoated sand grains; very strongly acid; gradual wavy boundary.

A'2—20 to 28 inches; light brownish gray (10YR 6/2) sand; few medium distinct light gray (10YR 7/1) mottles; single grain; loose; few medium roots; very strongly acid; clear wavy boundary.

B'21tg—28 to 50 inches; light gray (10YR 6/1) sandy clay loam; common medium distinct yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary.

B'22tg—50 to 62 inches; light gray (10YR 6/1) sandy clay loam; common medium distinct yellowish brown (10YR 5/6) and yellowish red (5YR 5/6) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; thin patchy clay films on faces of some peds; very strongly acid.

The underlying argillic horizon is at a depth of 26 to 40 inches. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas.

The A horizon is 10 to 18 inches thick. The A1 horizon has hue of 10YR, value of 2, 3, or 4, and chroma of 1. The A2 horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2.

The Bh horizon has hue of 5YR, value of 2 or 3, and chroma of 1 or 3 or hue of 7.5YR, value of 3 or 4, and chroma of 2 or 4.

The A'2 horizon has hue of 10YR, value of 6 or 7, and chroma of 2 or 3. If present, mottles are brown and gray.

The B'tg horizon has hue of 10YR, value of 6 or 7, and chroma or 1 or 2. If present, mottles are yellow, brown, and red. This horizon is sandy loam or sandy clay loam.

Ocilla series

The Ocilla series consists of deep, somewhat poorly drained, moderately permeable soils that formed in sandy and loamy sediment. These low-lying soils are on uplands and stream terraces. The water table is 1 foot to 2.5 feet below the surface from winter to mid spring. Slope is 0 to 2 percent.

Ocilla soils are geographically closely associated with Pelham and Stilson soils. The poorly drained Pelham soils are on lower lying landscapes. The moderately well drained Stilson soils are on somewhat higher lying landscapes.

Typical pedon of Ocilla loamy sand in a cultivated field 1,320 feet east on county road from Mt. Olive Church, 60 feet south of road:

A1—0 to 6 inches; very dark gray (10YR 6/2) loamy sand; weak fine granular structure; very friable; few fine roots; common root holes filled with very dark gray loamy sand; strongly acid; clear wavy boundary.

A21—6 to 20 inches; light brownish gray (10YR 6/2) loamy sand; weak fine granular structure; very friable; few fine roots; common root holes filled with very dark gray loamy sand; strongly acid; clear wavy boundary.

A21—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.

B1—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; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary.

B21t—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 1 percent plinthite; very strongly acid; gradual wavy boundary.

B22t—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.

B23t—68 to 80 inches; mottled light yellowish brown (10YR 6/4), light gray (10YR 7/1), strong brown (7.5YR 5/6), and brownish yellow (10YR 6/6) sandy clay loam; weak medium subangular blocky structure; friable; very strongly acid.

Solum thickness is 80 inches or more. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas.

The A horizon is 20 to 40 inches thick. The Ap horizon or A1 horizon is 4 to 6 inches thick and has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. The A2 horizon is 16 to 34 inches thick. It has hue of 10YR, value of 6, and chroma of 2 to 4 or hue of 2.5Y, value of 6 or 7, and chroma of 2 to 4. The A2 horizon has few to many gray and brown mottles.

The B1 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 6. This horizon has common gray and brown mottles.

The B21t horizon has hue of 10YR, value of 5 to 7, and chroma of 6 or 8 or hue of 2.5Y, value of 6 or 7, and chroma of 4 to 6. This horizon has few to many light gray, yellowish brown, and yellowish red mottles.

In the B22t and B23t horizons the matrix is mottled gray, brown, yellow, and red; or it has hue of 10YR, value of 5, and chroma of 2 to 4 or 6 or hue of 2.5Y, value of 6, and chroma of 4 or 6. This horizon has common or many gray, brown, and red mottles. Plinthite makes up as much as 3 percent of this horizon in some pedons.

Olustee series

The Olustee series consists of deep, poorly drained, moderately permeable soils. These soils formed in sandy and loamy marine sediment. They are in broad, smooth low-lying areas. The water table is within 1 foot of the surface in winter and spring. Slope is 0 to 2 percent.

Olustee soils are geographically closely associated with Alapaha, Leefield, Mascotte, and Pelham soils. The Alapaha, Leefield, and Pelham soils do not have a Bh horizon. The Alapaha and Pelham soils are on somewhat lower lying landscapes; also, the Alapaha soils contain more than 5 percent plinthite in the lower part of the subsoil, and the Pelham soils are arenic. The somewhat poorly drained Leefield soils contain plinthite and are arenic. The Mascotte soils commonly share the landscape with Olustee soils, but they do have an A2 horizon.

Typical pedon of Olustee sand in a cultivated field 1.1 miles south of Mt. Olive Church on county road and U.S. Highway 319, 1.2 miles east on county road, 1,320 feet south:

Ap—0 to 8 inches; very dark gray (10YR 3/1) sand; weak fine granular structure; very friable; many fine roots; very strongly acid; clear wavy boundary.

Bh—8 to 13 inches; dark brown (7.5YR 3/2) sand; massive in place, parting to weak fine granular structure; friable; weakly cemented; common fine roots; sand grains are organically stained; very strongly acid; clear wavy boundary.

B3&Bh—13 to 20 inches; dark brown (7.5YR 4/2) sand; few medium distinct grayish brown (10YR 5/2)

mottles; single grain; loose; common fine dark brown (7.5YR 3/2) weakly cemented bodies; very strongly acid; gradual wavy boundary.

A'2—20 to 34 inches; light brownish gray (10YR 6/2) sand; few fine distinct light yellowish brown mottles; single grain; loose; very strongly acid; clear wavy boundary.

B'2tg—34 to 65 inches; light gray (10YR 6/1) sandy clay loam; common medium distinct yellowish brown (10YR 5/6), yellowish red (5YR 4/6), and light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; patchy clay films on faces of peds and in pores; very strongly acid.

Solum thickness is 72 inches or more. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas. Depth to the B't horizon ranges from 32 to 40 inches.

The Ap horizon is 5 to 9 inches thick. It has hue of 10YR, value of 2 to 4, and chroma of 1.

The Bh horizon has hue of 5YR, 7.5YR, or 10YR, value of 2 or 3, and chroma of 2.

The B3&Bh horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 2. The Bh part of this horizon is one value higher than the Bh horizon above.

The A'2 horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. This horizon has yellow or brown mottles.

The B't horizon has hue of 10YR, value of 5 to 7, and chroma of 1. It has common or many red, brown, and yellow mottles. It is sandy loam or sandy clay loam.

Osier series

The Osier series consists of deep, poorly drained, rapidly permeable soils that formed in sandy alluvial sediment. These soils are on flood plains. The water table is less than 1 foot below the surface from late fall to early spring. Slope is 0 to 2 percent.

Osier soils are geographically closely associated with Kinston soils. Kinston soils are in a fine-loamy family.

Typical pedon of Osier fine sandy loam in an area of Kinston and Osier soils in a pasture 0.6 mile south of Ty Ty on county road; 60 feet west of road:

A—0 to 6 inches; dark gray (10YR 4/1) fine sandy loam; moderate fine granular structure; friable; many fine roots; thin strata of sand; strongly acid; abrupt wavy boundary.

C1g—6 to 14 inches; light brownish gray (10YR 6/2) sand; few fine distinct light yellowish brown (10YR 6/4) mottles; single grain; loose; common fine roots; few thin strata of gray loamy sand; strongly acid; clear wavy boundary.

C2g—14 to 36 inches; light gray (10YR 7/1) sand; single grain; loose; few partially decayed roots; strongly acid; gradual wavy boundary.

C3g—36 to 58 inches; light gray (10YR 7/1) sand; few medium distinct very pale brown (10YR 7/3) mottles; few iron stained strata of coarse sand; single grained; loose; strongly acid; gradual wavy boundary.

C4g—58 to 65 inches; light brownish gray (10YR 6/2) loamy coarse sand; few medium distinct grayish brown (10YR 5/2) and brownish yellow (10YR 6/6) mottles; weak fine granular structure; very friable; strongly acid.

The sandy layers are 72 or more inches thick. The soil is very strongly acid or strongly acid throughout. Thin strata ranging from sand to sandy loam are in most horizons.

The A horizon is 3 to 10 inches thick. It has hue of 10YR, value of 3 or 4, 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 is coarse sand or sand. This horizon has few or common mottles that are gray, yellow, and brown.

Pelham series

The Pelham series consists of deep, poorly drained, moderately permeable soils that formed in sandy and loamy marine sediment. These soils are in broad, smooth areas and in depressions on uplands and near drainageways. The water table commonly is 0.5 foot to 1.5 feet below the surface from mid winter to mid spring. Slope is 0 to 2 percent.

Pelham soils are geographically closely associated with Albany and Ocilla soils. The associated soils are on higher lying landscapes and are somewhat poorly drained. In addition, Albany soils are grossarenic.

Typical pedon of Pelham loamy sand in a cultivated field 0.7 mile south of Brookfield on hard surface county road; 50 feet east of road:

A1—0 to 5 inches; dark gray (10YR 4/1) loamy sand; weak fine granular structure; very friable; common fine roots in upper part; very strongly acid; clear wavy boundary.

A2—5 to 26 inches; gray (10YR 5/1) loamy sand; weak fine granular structure; very friable; common fine roots in upper part; very strongly acid; clear wavy boundary.

B1—26 to 32 inches; light gray (10YR 6/1) sandy loam; few medium distinct light yellowish brown (10YR 6/4) mottles; weak fine subangular blocky structure; friable; very strongly acid; clear wavy boundary.

B21tg—32 to 48 inches; light gray (10YR 6/1) sandy clay loam; common medium distinct brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary.

B22tg—48 to 65 inches; light gray (10YR 6/1) sandy clay loam; common medium distinct brownish yellow

(10YR 6/6) mottles and few medium distinct strong brown (7.5YR 5/6) and yellowish red (5YR 4/8) mottles; weak medium subangular blocky structure; friable; thin patchy clay films on faces of some peds; very strongly acid.

B23tg—65 to 80 inches; mottled light gray (10YR 6/1), yellowish brown (10YR 5/6), brownish yellow (10YR 6/6), and yellowish red (5YR 4/8) sandy clay loam; weak medium subangular blocky structure; friable; thin patchy clay films; very strongly acid.

Solum thickness is 60 to 72 inches or more. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas.

The A horizon is 26 to 36 inches thick. The A1 horizon has hue of 10YR, value of 3 or 4, and chroma of 1. The A2 horizon has hue of 10YR, value of 5 to 7, and chroma of 1.

The B1 horizon has hue of 10YR, value of 5 to 7, and chroma of 1. The B2t horizon has hue of 10YR, value of 5 to 7, and chroma of 0 to 2, or it is neutral and has value of 5 to 7. In some pedons, the B2t horizon has few to many fine or medium yellow, brown, or red mottles. This horizon is sandy clay loam or sandy loam.

Rains series

The Rains series consists of deep, poorly drained, moderately permeable soils that formed in loamy fluvial and marine sediment. These soils are in smooth areas and in slight depressions on terraces near the larger streams. The water table commonly is within 1 foot of the surface from late fall to mid spring. Slope is 0 to 2 percent.

Rains soils are geographically closely associated with Ocilla and Pelham soils. Ocilla soils are on somewhat higher lying landscapes and are somewhat poorly drained. Ocilla and Pelham soils are arenic.

Typical pedon of Rains loamy fine sand in a wooded area 1.3 miles west of Lake Larry on county road; 1.2 miles south on county road; 1,600 feet southeast:

A1—0 to 5 inches; very dark gray (10YR 3/1) loamy fine sand; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; abrupt smooth boundary.

A2—5 to 12 inches; grayish brown (10YR 5/2) loamy fine sand; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear wavy boundary.

B1g—12 to 16 inches; gray (10YR 6/1) sandy loam; few medium distinct yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable; common medium roots; very strongly acid; clear wavy boundary.

B21tg—16 to 30 inches; gray (10YR 6/1) sandy clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; many fine pores; thin patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

B22tg—30 to 48 inches; gray (10YR 6/1) sandy clay loam; common medium distinct yellowish brown (10YR 5/6) mottles and few medium distinct yellowish red (5YR 4/8) mottles; weak medium subangular blocky structure; friable; few fine pores; thin patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

B23tg—48 to 65 inches; gray (10YR 6/1) sandy clay loam; common medium distinct brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; friable; thin patchy clay films on faces of peds; very strongly acid.

Solum thickness is 60 to 70 inches or more. The soil is strongly acid or very strongly acid throughout except for the surface layer in limed areas.

The A horizon is 10 to 16 inches thick. The A1 horizon or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2.

The B1 horizon, if present, has hue of 10YR, value of 5 or 6, and chroma of 1. It has high chroma mottles in some pedons. The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 1. It has few to many brown, yellow, and red mottles. The Bt horizon commonly is sandy clay loam or clay loam, but in some pedons it is sandy clay below a depth of 40 inches.

Stilson series

The Stilson series consists of deep, moderately well drained, moderately permeable soils that formed in sandy and loamy marine sediment. These soils are on uplands. The water table is perched within 2.5 to 3.0 feet of the surface from winter to mid spring. Slope is 0 to 2 percent.

Stilson soils are geographically closely associated with Dothan, Leefield, and Alapaha soils. Dothan soils are on higher lying landscapes, are well drained, and have an A horizon less than 20 inches thick. Leefield soils are on slightly lower lying landscapes and have mottles with chroma of 2 or less within 30 inches of the surface. Alapaha soils are in drainageways and depressions and have dominant chroma of 2 or less in the Bt horizon.

Typical pedon of Stilson loamy sand in a cultivated field 3.8 miles east of G.O. Bailey School on hard surface road; 60 feet north of road:

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

A2—6 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.

B1—25 to 29 inches; light yellowish brown (10YR 6/4) sandy loam; weak fine subangular blocky structure; very friable; very strongly acid; clear wavy boundary.

B21t—29 to 39 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium distinct yellowish brown (10YR 5/6) mottles throughout and light brownish gray (10YR 6/2) mottles in the lower part; weak medium subangular blocky structure; friable; few fine pores; few nodules of ironstone; thin patchy clay films on faces of some peds; very strongly acid; gradual wavy boundary.

B22t—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; few nodules of ironstone; thin patchy clay films on faces of peds; about 2 percent plinthite; very strongly acid; gradual wavy boundary.

B23t—45 to 64 inches; brownish yellow (10YR 6/6) sandy clay loam; many coarse distinct light gray (10YR 7/1), yellowish red (5YR 4/8), and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine pores; few nodules of ironstone; thin patchy clay films on faces of peds; about 8 percent nodular plinthite in lower part; very strongly acid.

B24t—64 to 80 inches; brownish yellow (10YR 6/6) sandy clay loam; many coarse distinct light gray (10YR 7/1), yellowish red (5YR 4/8), and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; firm; thin patchy clay films; 2 percent plinthite in upper part; very strongly acid.

Solum thickness is 60 to 70 inches or more. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas. In some pedons the soil has few nodules of ironstone throughout.

The A horizon is 20 to 30 inches thick. The A1 horizon or Ap horizon is 10YR 4/2, 2.5Y 4/2, or 5Y 4/1. The A2 horizon has hue of 2.5Y, value of 5 or 6, and chroma of 4 or 6, or it is 10YR 5/2 or 10YR 6/4.

The B1 horizon has the same range in color as the A2 horizon.

The Bt horizon has hue of 10YR, value of 6, and chroma of 6 or 8. Few or common gray and brown mottles are at a depth of 30 to 40 inches. The lower part of the Bt horizon has distinct or prominent gray, red, and brown mottles. The Bt horizon commonly is sandy clay loam, but in some pedons it is sandy loam. Plinthite makes up 5 to 15 percent of the lower part of the Bt horizon.

Sunsweet series

The Sunsweet series consists of deep, well drained, moderately slowly permeable soils that formed dominantly in clayey marine sediment. Sunsweet soils are on uplands. Slope is 5 to 12 percent.

Sunsweet soils are geographically closely associated with Carnegie, Cowarts, and Tifton soils. Carnegie soils are 5 percent or more plinthite between depths of 18 and 22 inches. Cowarts and Tifton soils are in a fine-loamy family and commonly are on smoother landscapes. Also, Cowarts soils have a thinner solum and contain less than 5 percent plinthite in the subsoil.

Typical pedon of Sunsweet gravelly sandy loam, 5 to 12 percent slopes, eroded, in a wooded area 1,950 feet south of the animal disease laboratory on the Coastal Plain Experiment Station:

Apcn—0 to 4 inches; dark grayish brown (10YR 4/2) gravelly sandy loam; weak fine granular structure; very friable; many fine and medium roots; about 18 percent nodules of ironstone 0.12 to 0.50 inch in diameter; very strongly acid; abrupt wavy boundary.

B21tcn—4 to 9 inches; strong brown (7.5YR 5/6) sandy clay; moderate medium subangular blocky structure; firm; common fine and medium roots; thin patchy clay films on faces of peds; 10 percent nodules of ironstone; very strongly acid; clear wavy boundary.

B22t—9 to 12 inches; strong brown (7.5YR 5/6) sandy clay; common medium prominent red (2.5YR 4/8) and common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium angular blocky structure; firm; thin patchy clay films on faces of peds; 5 percent nodules of ironstone; 8 percent plinthite; very strongly acid; clear wavy boundary.

B23t—12 to 17 inches; yellowish brown (10YR 5/6) sandy clay; many medium prominent red (10R 4/6) and many medium distinct light gray (10YR 7/1) mottles; moderate medium angular blocky structure; firm; thin patchy clay films on faces of peds; 10 percent plinthite; very strongly acid; clear wavy boundary.

B24t—17 to 66 inches; coarsely mottled yellowish brown (10YR 5/6), dusky red (10R 3/4), and light gray (10YR 7/1) sandy clay; moderate medium angular blocky structure; firm; thin patchy clay films on faces of peds; 12 percent plinthite; very strongly acid.

Solum thickness is 60 to 72 inches or more. The soils are strongly acid or very strongly acid throughout except for the surface layer in limed areas. Horizons that are more than 5 percent plinthite are at a depth of 8 to 12 inches.

The A horizon is 3 to 6 inches thick. The Ap horizon has hue of 10YR, value of 4, and chroma of 2 or 3. Nodules of ironstone make up 5 to 20 percent, by volume, of the A horizon.

The Bt horizon has hue of 5YR, value of 4 or 5, and chroma of 6 or 8, and hue of 7.5YR; value of 5; and chroma of 6 or 8, or hue of 10YR; value of 5; and chroma of 4 or 6. It is sandy clay or clay. The B22t horizon has common medium red and brown mottles.

Commonly, the B23t horizon has red, brown, and gray mottles, and the B24t horizon has medium and coarse red, brown, and gray mottles. The gray mottles do not represent wetness. Content of nodules of ironstone ranges from 5 to 15 percent in the upper part of the Bt horizon and from 0 to 5 percent in the lower part. Plinthite makes up 6 to 10 percent of the B22t horizon and 6 to 15 percent of the B23t and B24t horizons.

Susquehanna series

The Susquehanna series consists of deep, somewhat poorly drained, very slowly permeable soils that formed in clayey marine sediment. Susquehanna soils are on uplands. The water table commonly is at a depth of more than 6 feet. These soils are wet during periods of high rainfall, but they do not have a free water table. Slope is 2 to 5 percent.

Susquehanna soils are geographically closely associated with Cowarts and Esto soils. The Cowarts and Esto soils are well drained. The Cowarts soils are in a fine-loamy family.

Typical pedon of Susquehanna sandy loam, 2 to 5 percent slopes, in a pasture 0.5 mile south of Tift-Worth County line road from bridge over Daniels Creek; 0.6 mile east on county road; 2,700 feet south on private road; 50 feet east:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) sandy loam; weak medium granular structure; friable; common fine roots; very strongly acid; abrupt wavy boundary.

B21t—6 to 17 inches; yellowish red (5YR 4/6) clay; few fine distinct strong brown (7.5YR 5/6) mottles throughout and pinkish gray (7.5YR 6/2) mottles in the lower part; strong medium subangular blocky structure; very firm; very plastic; few fine roots; continuous thin clay films on faces of most peds; very strongly acid; clear wavy boundary.

B22t—17 to 45 inches; mottled light brownish gray (10YR 6/2), strong brown (7.5YR 5/6), and red (2.5YR 4/6) clay; strong medium subangular blocky structure; very firm; very plastic; few fine roots; continuous clay films on faces of peds; few slickensides; very strongly acid; gradual wavy boundary.

B23t—45 to 60 inches; mottled light gray (10YR 6/1), strong brown (7.5YR 5/6), and dark red (10R 3/6) clay; strong medium subangular blocky structure; very firm; very plastic; continuous clay films on faces of peds; few slickensides; very strongly acid; gradual wavy boundary.

B24t—60 to 84 inches; light gray (5Y 7/2) clay; few medium distinct strong brown (7.5YR 5/6) mottles and few medium prominent red (10R 4/6) mottles; weak medium subangular blocky structure; very firm; very plastic; continuous clay films on faces of peds; few slickensides; very strongly acid.

Solum thickness is 60 to 70 inches. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas.

The Ap horizon has hue of 10YR, value of 4, and chroma of 2. The A1 horizon, if present, has hue of 10YR, value of 4, and chroma of 1 or 2. There are a few nodules of ironstone in some pedons.

In the Bt horizon the upper part has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 and has few or common gray, red, or brown mottles. The lower part has hue of 10YR or 5Y, value of 4 to 7, and chroma of 1 or 2 and has few to many red and brown mottles. In some pedons, the lower part of the Bt horizon is mottled red, brown, and gray and has no dominant matrix color. The Bt horizon is clay but ranges to silty clay.

Tifton series

The Tifton series consists of deep, well drained, moderately permeable soils that formed dominantly in loamy marine sediment. Tifton soils are on uplands. Slope is 0 to 8 percent.

Tifton soils are geographically closely associated with Carnegie, Clarendon, and Dothan soils. Carnegie soils in most places are on hillsides and have a clayey subsoil that is 5 percent or more plinthite between depths of 18 and 22 inches. Clarendon soils are in lower lying areas and have chroma of 2 or less within 30 inches of the surface. Dothan soils commonly are on smoother landscapes and contain fewer nodules of ironstone.

Typical pedon of Tifton loamy sand, 2 to 5 percent slopes, in a pasture 0.4 mile east of Zion Hope Church on county road; 50 feet west of road:

Apcn—0 to 10 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable; many fine roots; 12 percent nodules of ironstone 0.12 to 0.50 inch in diameter; strongly acid; abrupt wavy boundary.

Blcn—10 to 14 inches; yellowish brown (10YR 5/6) sandy loam; weak fine subangular blocky structure; friable; common fine roots; 15 percent nodules of ironstone; strongly acid; clear wavy boundary.

B21tcn—14 to 22 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; common fine roots; sand grains coated and bridged with clay; patchy clay films on faces of peds; 10 percent nodules of ironstone; very strongly acid; gradual wavy boundary.

B22tcn—22 to 39 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; sand grains coated and bridged with clay; patchy clay films on faces of peds; 8 percent small nodules of ironstone; 2 percent plinthite in the lower part; very strongly acid; gradual smooth boundary.

B23t—39 to 44 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium prominent red

(2.5YR 4/8) mottles; moderate medium subangular blocky structure; firm; patchy clay films on faces of peds; 3 percent small nodules of ironstone; about 15 percent plinthite; very strongly acid; gradual wavy boundary.

B24t—44 to 72 inches; reticulately mottled yellowish brown (10YR 5/6), red (10R 4/8), light gray (10YR 7/1), and olive yellow (2.5Y 6/6) sandy clay loam; weak medium subangular blocky structure; firm; patchy clay films on faces of peds; about 10 percent plinthite; very strongly acid.

Solum thickness is 60 to 72 inches or more. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas.

The A horizon is 10 to 14 inches thick. The Ap horizon has hue of 10YR, value of 4, and chroma of 2 or 3. The A2 horizon, if present, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 or 6. Nodules of ironstone make up 5 to 25 percent, by volume, of the A horizon.

The B21t, B22t, and B23t horizons have hue of 10YR or 7.5YR, value of 5, and chroma of 4, 6, or 8. The B23t horizon has few or common red mottles. The B24t horizon is reticulately mottled red, brown, gray, or yellow, or it has dominant hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4, 6, or 8. In the Bt horizon, plinthite content ranges fom 8 to 15 percent between depths of 30 and 60 inches. Nodules of ironstone make up 10 to 15 percent of the upper part of the Bt horizon, and 8 percent of the middle and lower parts.

Formation of the soils

Soil characteristics are determined by the physical and mineral composition of the parent material; the climate under which the parent material accumulated and has existed since accumulation; the plant and animal life on and in the soil; the relief, or lay of the land; and the length of time that the forces of soil formation have acted on the soil material (*4*). All of these factors influence every soil, but the relative significance of each factor varies from place to place.

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.

Tift County is underlain mostly by loamy and sandy Coastal Plain marine sediments (*5*). Soils in the southern part of the county are underlain by sedimentary material classified as the Miccosukee Formation; those in the northern part are underlain by sediments classified as Neogene Undifferentiated. In most of Tift County, these marine sediments are stratified and weakly consolidated.

The soils on uplands formed in these sediments and are mostly low in base saturation; they are strongly acid or very strongly acid throughout except in the surface layer in limed areas. Soils that have a loamy subsoil, such as Cowarts, Dothan, and Tifton soils, have siliceous mineralogy. Soils that have a clayey subsoil, such as Carnegie, Esto, and Sunsweet, are mainly kaolinitic. The sandy soils, such as Kershaw and Lakeland soils, have very little silt and clay and very high content of quartz sand; they are not assigned to a mineralogy class.

The soils on flood plains formed in more recent sediments than the soils on the uplands. Osier soils formed in these recent sediments and are considered "young" because they do not have a subsoil. These soils have siliceous mineralogy, reflecting the characteristics of the upland soils from which the parent material washed.

Plants and animals

The role of plants, animals, and other organisms is significant in soil development. Plants and animals increase the content of organic matter and nitrogen and increase or decrease the content of plant nutrients in the soil, and they change the structure and porosity of the soil.

Plants recycle nutrients, accumulate as organic matter, and provide food and cover for animals. They stabilize the surface layer so that soil-forming processes can continue. Plants also provide a more stable environment for soil-forming processes by protecting the soils from extremes in temperature.

The soils in Tift County formed under a succession of briars, 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 for crops, removing natural vegetation and establishing different vegetation, 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 Tift County. However, the relationship among 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 Tift 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 Tift County formed under a thermic temperature regime. The average annual air temperature is about 67 degrees F. The soil temperature at a depth

of 20 inches is commonly about 2 degrees higher. 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 land surface considered collectively. The color of the soil, wetness, thickness of the A horizon, content of organic matter, and plant cover are commonly related to relief. In Tift County, the obvious effects of relief are color of the soil and wetness.

Dothan and Tifton soils have mainly a yellowish brown subsoil; Grady and Rains 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 higher lying and better drained than the other soils; therefore, the soil material is better oxidized and the subsoil is browner.

The movement of water across the surface and through the soil is controlled to a large extent by relief. Water flowing over the soil commonly carries solid particles and causes erosion or deposition, depending on the kind of relief. In sloping areas, more water runs off and less water enters the soil, so the soils are drier. In lower lying areas the soils commonly are wetter because they receive the water that flows off and through the higher lying soils.

Time

The length of time that soil-forming factors act on the parent material determines to a large degree the characteristics of the soil. Determinations of when soil formation began in the survey area are not exact, but most soils in Tift County are considered mature. A mature soil is in equilibrium with the environment. It has readily recognized pedogenic horizons and a regular decrease in content of carbon with depth. Some Dothan and Tifton soils, for example, are on rather broad, stable landscapes, where the soil-forming processes have been active for thousands of years. These mature soils have a thick solum and well expressed zones of eluviation and illuviation.

Osier soils receive sediment annually from floodwaters. These "young" soils are stratified and are not old enough to have a zone of illuviation. Young soils do not have pedogenic horizons. The content of carbon decreases irregularly with depth in these soils.

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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

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

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.

Coarse textured soil. Sand or loamy sand.

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 all or part of the 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.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial

drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide 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.

Fine textured soil. Sandy clay, silty clay, and clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

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.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

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.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the 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 Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

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.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Drip (or 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.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Leaching. The removal of soluble material from soil or other material by percolating water.

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.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

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.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

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.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.20 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). Formation of subsurface tunnels or pipelike cavities 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. The water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

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. Seepage 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.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and runoff water.

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.

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.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

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.

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 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.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

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 in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-78 at Tifton, 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[1]	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----	59.9	37.6	48.8	79	15	157	4.14	2.07	5.93	7	.0
February---	62.6	39.4	51.1	80	20	152	4.27	2.47	5.86	7	.0
March------	69.5	46.5	58.1	85	26	277	4.49	2.45	6.28	7	.0
April------	77.8	54.4	66.1	89	37	483	3.85	1.46	5.84	5	.0
May--------	84.4	61.7	73.0	95	46	713	4.11	2.08	5.88	6	.0
June-------	89.1	67.7	78.5	98	55	855	4.44	2.45	6.18	7	.0
July-------	90.6	70.2	80.4	98	62	942	5.38	3.42	7.14	9	.0
August-----	90.8	70.0	80.4	98	62	942	4.69	2.27	6.78	7	.0
September--	87.1	66.3	76.7	96	53	801	3.45	1.27	5.26	5	.0
October----	79.0	54.7	66.9	92	34	524	2.01	.48	3.24	4	.0
November---	69.7	45.4	57.6	84	25	243	2.18	.84	3.30	4	.0
December---	62.2	39.1	50.7	80	19	135	3.55	2.02	4.90	6	.0
Yearly:											
Average--	76.9	54.4	65.7	---	---	---	---	---	---	---	---
Extreme--	---	---	---	100	14	---	---	---	---	---	---
Total----	---	---	---	---	---	6,224	46.56	38.55	54.21	74	.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

[Recorded in the period 1951-78 at Tifton, 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 4	March 15	March 29
2 years in 10 later than--	February 22	March 8	March 23
5 years in 10 later than--	February 1	February 22	March 11
First freezing temperature in fall:			
1 year in 10 earlier than--	November 17	November 11	October 30
2 years in 10 earlier than--	November 27	November 17	November 5
5 years in 10 earlier than--	December 17	November 29	November 18

TABLE 3.--GROWING SEASON

[Recorded in the period 1951-78 at Tifton, Georgia]

Probability	Daily minimum temperature		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	283	251	223
8 years in 10	294	260	232
5 years in 10	318	279	251
2 years in 10	351	298	269
1 year in 10	>365	307	279

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
Ah	Alapaha loamy sand	26,907	15.8
An	Alapaha-Urban land complex	788	0.5
AoA	Albany sand	500	0.3
ArA	Ardilla loamy sand	1,874	1.1
CaB2	Carnegie sandy loam, 3 to 5 percent slopes, eroded	1,883	1.1
CaC2	Carnegie sandy loam, 5 to 8 percent slopes, eroded	2,914	1.7
Cn	Clarendon loamy sand	2,625	1.5
CoB	Cowarts loamy sand, 2 to 5 percent slopes	4,773	2.8
CrC2	Cowarts sandy loam, 5 to 8 percent slopes, eroded	3,359	2.0
DoA	Dothan loamy sand, 0 to 2 percent slopes	1,264	0.7
DoB	Dothan loamy sand, 2 to 5 percent slopes	11,851	7.0
EuB	Esto sandy loam, 2 to 5 percent slopes	656	0.4
EuC	Esto sandy loam, 5 to 8 percent slopes	385	0.2
FsB	Fuquay loamy sand, 0 to 5 percent slopes	10,660	6.3
Gr	Grady sandy loam	496	0.3
KeC	Kershaw coarse sand, 2 to 8 percent slopes	308	0.2
KO	Kinston and Osier fine sandy loams	12,923	7.6
LaB	Lakeland sand, 0 to 5 percent slopes	2,604	1.5
LaC	Lakeland sand, 5 to 8 percent slopes	569	0.3
Le	Leefield loamy sand	2,719	1.6
Mn	Mascotte sand	126	0.1
Oc	Ocilla loamy sand	6,560	3.9
Of	Ocilla loamy sand, occasionally flooded	720	0.4
OnA	Ocilla-Urban land complex	509	0.3
Os	Olustee sand	523	0.3
Pe	Pelham loamy sand	5,892	3.5
Ra	Rains loamy fine sand	1,772	1.0
Se	Stilson loamy sand	4,375	2.6
StD2	Sunsweet gravelly sandy loam, 5 to 12 percent slopes, eroded	372	0.2
SuB	Susquehanna sandy loam, 2 to 5 percent slopes	119	0.1
TfA	Tifton loamy sand, 0 to 2 percent slopes	2,174	1.3
TfB	Tifton loamy sand, 2 to 5 percent slopes	49,304	29.0
TsC2	Tifton sandy loam, 5 to 8 percent slopes, eroded	3,311	1.9
TuB	Tifton-Urban land complex, 0 to 5 percent slopes	4,325	2.5
	Water	100	0.1
	Total	170,240	100.0

TABLE 5.--IMPORTANT FARMLAND

[Recorded in 1979]

Soil name and map symbol	Prime farmland	Additional farmland of statewide importance
	Acres	Acres
AoA---------- Albany	---	500
ArA---------- Ardilla	---	1,874
CaB2---------- Carnegie	1,883	---
CaC2---------- Carnegie	---	2,914
Cn---------- Clarendon	2,625	---
CoB---------- Cowarts	4,773	---
CrC2---------- Cowarts	---	3,359
DoA---------- Dothan	1,264	---
DoB---------- Dothan	11,851	---
EuB---------- Esto	---	656
EuC---------- Esto	---	385
FsB---------- Fuquay	---	10,660
Le---------- Leefield	---	2,719
Oc---------- Ocilla	---	6,560
Os---------- Olustee	---	523
Se---------- Stilson	4,375	---
TfA---------- Tifton	2,174	---
TfB---------- Tifton	49,304	---
TsC2---------- Tifton	3,311	---
Total----------	81,560	30,150

TABLE 6.--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]

Soil name and map symbol	Corn		Soybeans		Peanuts		Tobacco		Improved bermudagrass		Bahiagrass	
	N	I	N	I	N	I	N	I	N	I	N	I
	Bu	Bu	Bu	Bu	Lb	Lb	Lb	Lb	AUM*	AUM*	AUM*	AUM*
Ah---------- Alapaha	---	---	---	---	---	---	---	---	---	---	5.0	6.5
An---------- Alapaha-Urban land	---	---	---	---	---	---	---	---	---	---	---	---
AoA---------- Albany	65	105	25	33	1,700	2,300	---	2,100	7.0	9.0	6.5	8.0
ArA---------- Ardilla	85	135	45	55	---	---	---	---	8.5	10.5	8.5	10.5
CaB2---------- Carnegie	65	105	30	35	2,500	3,400	---	2,400	6.5	8.0	7.0	8.5
CaC2---------- Carnegie	55	90	25	30	---	---	---	---	6.0	7.5	6.5	8.0
Cn---------- Clarendon	110	175	40	50	---	---	---	3,500	10.5	13.0	10.0	12.5
CoB---------- Cowarts	80	125	35	40	2,400	3,300	---	---	8.0	10.0	7.5	9.5
CrC2---------- Cowarts	60	100	20	23	1,600	2,200	---	---	7.0	9.0	6.5	8.5
DoA---------- Dothan	120	190	40	45	3,800	5,100	---	3,500	10.5	13.0	9	11.5
DoB---------- Dothan	120	190	35	40	3,600	4,800	---	3,500	10.5	13.0	9	11.5
EuB---------- Esto	50	80	35	40	1,700	2,050	---	---	6.0	7.5	6.0	7.0
EuC---------- Esto	40	65	30	35	1,500	1,800	---	---	5.8	7.0	5.8	6.5
FsB---------- Fuquay	80	140	30	40	2,900	4,350	---	3,300	7.5	9.5	7.5	9.0
Gr---------- Grady	---	---	---	---	---	---	---	---	---	---	---	---
KeC---------- Kershaw	---	---	---	---	---	---	---	---	3.5	4.5	3.5	4.0
KO---------- Kinston and Osier	---	---	---	---	---	---	---	---	---	---	---	---
LaB---------- Lakeland	55	110	20	35	2,000	3,500	---	1,800	7.0	10.0	7.0	10.0
LaC---------- Lakeland	---	---	---	---	---	---	---	---	6.5	9.5	6.5	9.5
Le---------- Leefield	85	135	45	55	---	---	---	---	8.7	10.5	8.0	10.0
Mn---------- Mascotte	50	70	20	25	---	---	---	---	---	---	8.0	10.5

See footnote at end of table.

TABLE 6.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn		Soybeans		Peanuts		Tobacco		Improved bermudagrass		Bahiagrass	
	N	I	N	I	N	I	N	I	N	I	N	I
	Bu	Bu	Bu	Bu	Lb	Lb	Lb	Lb	AUM*	AUM*	AUM*	AUM*
Oc---------- Ocilla	75	120	35	45	---	---	---	2,600	8.5	10.5	8.0	10.0
Of---------- Ocilla	65	105	30	40	---	---	---	2,400	8.5	10.5	8.0	10.0
OnA---------- Ocilla-Urban land	---	---	---	---	---	---	---	---	---	---	---	---
Os---------- Olustee	70	95	30	38	---	---	---	---	---	---	8.5	10.5
Pe---------- Pelham	---	---	---	---	---	---	---	---	---	---	---	---
Ra---------- Rains	---	---	---	---	---	---	---	---	---	---	6.0	7.0
Se---------- Stilson	80	130	35	45	---	---	---	2,600	10.0	12.5	7.5	10.0
StD2---------- Sunsweet	---	---	---	---	---	---	---	---	4.5	6.0	4.5	6.0
SuB---------- Susquehanna	---	---	---	---	---	---	---	---	---	---	6.5	7.5
TfA---------- Tifton	115	185	46	55	3,800	5,100	---	3,300	10.5	13.5	8.5	10.5
TfB---------- Tifton	115	185	46	55	3,800	5,100	---	3,300	10.5	13.5	8.5	10.5
TsC2---------- Tifton	80	130	34	40	3,000	4,050	---	2,400	9.0	12.0	7.0	9.0
TuB---------- Tifton-Urban land	---	---	---	---	---	---	---	---	---	---	---	---

* 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	3,438	---	---	---
II	92,506	70,253	11,593	10,660
III	13,942	5,850	8,092	---
IV	11,999	6,777	2,618	2,604
V	47,006	---	47,006	---
VI	941	372		569
VII	308	---	---	308

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]

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Potential productivity: Common trees	Potential productivity: Site index	Trees to plant
Ah---------- Alapaha	2w	Slight	Moderate	Slight	Slash pine----------	87	Slash pine, loblolly pine.
					Loblolly pine----------	87	
					Longleaf pine----------	70	
AoA---------- Albany	2w	Slight	Moderate	Moderate	Loblolly pine----------	95	Loblolly pine, slash pine.
					Slash pine----------	85	
					Longleaf pine----------	80	
ArA---------- Ardilla	2w	Slight	Moderate	Moderate	Loblolly pine----------	90	Loblolly pine, longleaf pine, slash pine, sweetgum.
					Longleaf pine----------	78	
					Slash pine----------	89	
					Sweetgum----------	90	
					Water oak----------	90	
CaB2, CaC2--------- Carnegie	2o	Slight	Slight	Slight	Loblolly pine----------	86	Loblolly pine, slash pine.
					Slash pine----------	86	
					Longleaf pine----------	72	
Cn---------- Clarendon	2w	Slight	Moderate	Slight	Loblolly pine----------	90	Loblolly pine, slash pine, American sycamore, yellow-poplar, sweetgum.
					Slash pine----------	90	
					Sweetgum----------	85	
CoB, CrC2---------- Cowarts	2o	Slight	Slight	Slight	Loblolly pine----------	86	Loblolly pine, longleaf pine, slash pine.
					Slash pine----------	86	
					Longleaf pine----------	67	
DoA, DoB---------- Dothan	2o	Slight	Slight	Slight	Slash pine----------	89	Slash pine, loblolly pine, longleaf pine.
					Longleaf pine----------	70	
					Loblolly pine----------	---	
EuB, EuC---------- Esto	3o	Slight	Slight	Slight	Loblolly pine----------	82	Loblolly pine, slash pine, longleaf pine.
					Longleaf pine----------	66	
					Slash pine----------	82	
FsB---------- Fuquay	3s	Slight	Moderate	Moderate	Loblolly pine----------	83	Slash pine, longleaf pine.
					Slash pine----------	83	
					Longleaf pine----------	67	
Gr---------- Grady	4w	Slight	Severe	Severe	Baldcypress----------	---	Loblolly pine, slash pine, American sycamore, water tupelo.
					Blackgum----------	65	
					Water oak----------	65	
KeC---------- Kershaw	5s	Slight	Moderate	Severe	Slash pine----------	65	Sand pine, slash pine, longleaf pine.
					Longleaf pine----------	55	
KO*:							
Kinston----------	1w	Slight	Severe	Severe	Loblolly pine----------	100	Loblolly pine, slash pine, American sycamore, yellow-poplar, eastern cottonwood, cherrybark oak, green ash, sweetgum.
					Sweetgum----------	95	
					White oak----------	90	
					Eastern cottonwood-----	100	
					Cherrybark oak---------	95	
Osier----------	3w	Slight	Severe	Severe	Slash pine----------	85	Slash pine, loblolly pine.
					Loblolly pine----------	87	
					Longleaf pine----------	69	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Potential productivity: Common trees	Potential productivity: Site index	Trees to plant
LaB, LaC---------- Lakeland	4s	Slight	Moderate	Moderate	Slash pine----------	75	Slash pine, loblolly pine.
					Loblolly pine----------	75	
					Longleaf pine----------	60	
Le---------- Leefield	3w	Slight	Moderate	Moderate	Loblolly pine----------	84	Loblolly pine, slash pine.
					Slash pine----------	84	
					Longleaf pine----------	70	
Mn---------- Mascotte	3w	Slight	Moderate	Moderate	Slash pine----------	80	Slash pine, loblolly pine.
					Loblolly pine----------	80	
					Longleaf pine----------	70	
Oc, Of---------- Ocilla	3w	Slight	Moderate	Moderate	Loblolly pine----------	85	Loblolly pine, slash pine.
					Slash pine----------	90	
					Longleaf pine----------	77	
Os---------- Olustee	3w	Slight	Moderate	Moderate	Slash pine----------	80	Slash pine, loblolly pine.
					Loblolly pine----------	80	
					Longleaf pine----------	70	
Pe---------- Pelham	2w	Slight	Severe	Severe	Slash pine----------	90	Slash pine, loblolly pine.
					Loblolly pine----------	90	
					Longleaf pine----------	80	
					Sweetgum----------	80	
					Blackgum----------	80	
					Water oak----------	80	
Ra---------- Rains	2w	Slight	Severe	Severe	Loblolly pine----------	94	Loblolly pine, slash pine, sweetgum, American sycamore.
					Slash pine----------	91	
					Sweetgum----------	90	
Se---------- Stilson	2w	Slight	Moderate	Slight	Loblolly pine----------	95	Slash pine, loblolly pine, longleaf pine.
					Slash pine----------	95	
					Longleaf pine----------	80	
					Sweetgum----------	---	
StD2---------- Sunsweet	3c	Slight	Moderate	Moderate	Loblolly pine----------	85	Loblolly pine, slash pine.
					Slash pine----------	85	
					Longleaf pine----------	70	
SuB---------- Susquehanna	3c	Slight	Moderate	Slight	Loblolly pine----------	78	Loblolly pine, shortleaf pine.
					Shortleaf pine---------	68	
TfA, TfB, TsC2----- Tifton	2o	Slight	Slight	Slight	Loblolly pine----------	86	Loblolly pine, slash pine.
					Slash pine----------	86	
					Longleaf pine----------	72	

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--RECREATIONAL DEVELOPMENT

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

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Ah---------- Alapaha	Severe: floods, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
An*:					
Alapaha----------	Severe: floods, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Urban land.					
AoA---------- Albany	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
ArA---------- Ardilla	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
CaB2---------- Carnegie	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope.	Slight----------	Slight.
CaC2---------- Carnegie	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight----------	Slight.
Cn---------- 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.
CrC2---------- Cowarts	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight----------	Slight.
DoA---------- Dothan	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
DoB---------- Dothan	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
EuB---------- Esto	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight----------	Slight.
EuC---------- Esto	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight----------	Slight.
FsB---------- Fuquay	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
Gr---------- Grady	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
KeC---------- Kershaw	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
KO*:					
Kinston	Severe: floods, wetness.	Severe: floods, wetness.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: floods, wetness.
Osier	Severe: floods, wetness.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness.	Severe: wetness, droughty, floods.
LaB Lakeland	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
LaC Lakeland	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
Le Leefield	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
Mn Mascotte	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness.
Oc Ocilla	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
Of Ocilla	Severe: floods.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty, floods.
OnA*:					
Ocilla	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
Urban land.					
Os Olustee	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness.
Pe Pelham	Severe: floods, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ra Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Se Stilson	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: droughty.
StD2 Sunsweet	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: droughty, slope.
SuB Susquehanna	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Slight	Slight.
TfA Tifton	Slight	Slight	Moderate: small stones.	Slight	Slight.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
TfB---------- Tifton	Slight----------	Slight----------	Moderate: slope, small stones.	Slight----------	Slight.
TsC2---------- Tifton	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
TuB*:					
Tifton----------	Slight----------	Slight----------	Moderate: slope, small stones.	Slight----------	Slight.
Urban land.					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor"]

Soil name and map symbol	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
Ah---------- Alapaha	Very poor.	Poor	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair.
An*:										
Alapaha----------	Very poor.	Poor	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair.
Urban land.										
AoA---------- Albany	Fair	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Poor.
ArA---------- Ardilla	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
CaB2---------- Carnegie	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CaC2---------- Carnegie	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Cn---------- Clarendon	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CoB---------- Cowarts	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
CrC2---------- Cowarts	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
DoA, DoB---------- Dothan	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
EuB---------- Esto	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EuC---------- Esto	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
FsB---------- Fuquay	Fair	Fair	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
Gr---------- Grady	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
KeC---------- Kershaw	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
KO*:										
Kinston----------	Very poor.	Poor	Poor	Poor	Poor	Good	Fair	Poor	Poor	Fair.
Osier----------	Very poor.	Poor	Fair	Fair	Fair	Fair	Good	Poor	Fair	Fair.
LaB, LaC---------- Lakeland	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Le---------- Leefield	Fair	Fair	Good	Fair	Fair	Fair	Fair	Fair	Fair	Fair.
Mn---------- Mascotte	Poor	Fair	Fair	Poor	Fair	Poor	Fair	Fair	Fair	Poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	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
Oc---------- Ocilla	Fair	Fair	Good	Fair	Good	Fair	Fair	Fair	Good	Fair
Of---------- Ocilla	Poor	Fair	Fair	Fair	Good	Fair	Fair	Fair	Good	Fair.
OnA*:										
Ocilla----------	Fair	Fair	Good	Fair	Good	Fair	Fair	Fair	Good	Fair.
Urban land.										
Os---------- Olustee	Poor	Fair	Fair	Poor	Fair	Poor	Fair	Fair	Fair	Poor.
Pe---------- Pelham	Poor	Poor	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair.
Ra---------- Rains	Very poor.	Very poor.	Very poor.	Fair	Fair	Good	Good	Very poor.	Poor	Good.
Se---------- Stilson	Fair	Fair	Good	Fair	Fair	Poor	Poor	Fair	Fair	Poor.
StD2---------- Sunsweet	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
SuB---------- Susquehanna	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very 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.
TsC2---------- Tifton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
TuB*:										
Tifton----------	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT

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

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Ah---------- Alapaha	Severe: cutbanks cave, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: wetness.
An*:						
Alapaha----------	Severe: cutbanks cave, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: wetness.
Urban land.						
AoA---------- Albany	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Severe: droughty.
ArA---------- Ardilla	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
CaB2, CaC2-------- Carnegie	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
Cn---------- Clarendon	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
CoB---------- Cowarts	Slight---------	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
CrC2---------- Cowarts	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
DoA, DoB---------- Dothan	Slight. wetness.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate:
EuB---------- Esto	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Slight.
EuC---------- Esto	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell.	Slight.
FsB---------- Fuquay	Moderate: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty.
Gr---------- Grady	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding.	Severe: ponding.
KeC---------- Kershaw	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Severe: droughty.
KO*:						
Kinston----------	Severe: wetness, floods.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: low strength, wetness, floods.	Severe: wetness, floods.
Osier----------	Severe: cutbanks cave, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: wetness, floods.	Severe: wetness, droughty, floods.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
LaB---------- Lakeland	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty, too sandy.
LaC---------- Lakeland	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: droughty, too sandy.
Le---------- Leefield	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
Mn---------- Mascotte	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Oc---------- Ocilla	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
Of---------- Ocilla	Severe: cutbanks cave, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods.	Moderate: wetness, droughty, floods.
OnA*:						
Ocilla----------	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
Urban land.						
Os---------- Olustee	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Pe---------- Pelham	Severe: cutbanks cave, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: wetness, floods.	Severe: wetness.
Ra---------- Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Se---------- Stilson	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty.
StD2---------- Sunsweet	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
SuB---------- Susquehanna	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
TfA, TfB---------- Tifton	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Slight.
TsC2---------- Tifton	Moderate: wetness.	Slight---------	Moderate: wetness.	Moderate: slope.	Slight---------	Slight.
TuB*:						
Tifton----------	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Slight.
Urban land.						

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--SANITARY FACILITIES

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

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ah---------- Alapaha	Severe: floods, wetness, percs slowly.	Severe: seepage, floods, wetness.	Severe: floods, wetness.	Severe: floods, seepage, wetness.	Poor: wetness.
An*:					
Alapaha----------	Severe: floods, wetness, percs slowly.	Severe: seepage, floods, wetness.	Severe: floods, wetness.	Severe: floods, seepage, wetness.	Poor: wetness.
Urban land.					
AoA---------- Albany	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy, wetness.
ArA---------- Ardilla	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: seepage, wetness.	Poor: wetness.
CaB2, CaC2---------- Carnegie	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
Cn---------- Clarendon	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
CoB, CrC2---------- Cowarts	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Good.
DoA---------- Dothan	Moderate: wetness, percs slowly.	Moderate: seepage.	Slight----------	Slight----------	Good.
DoB---------- Dothan	Moderate: wetness, percs slowly.	Moderate: seepage, slope.	Slight----------	Slight----------	Good.
EuB, EuC---------- Esto	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey, hard to pack.
FsB---------- Fuquay	Moderate: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Fair: too sandy.
Gr---------- Grady	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: ponding.
KeC---------- Kershaw	Severe: poor filter.	Severe: seepage.	Severe: too sandy, seepage.	Severe: seepage.	Poor: seepage, too sandy.
KO*:					
Kinston----------	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, seepage, wetness.	Severe: floods, seepage, wetness.	Poor: wetness.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
KO*:					
Osier	Severe: floods, wetness, poor filter.	Severe: seepage, floods, wetness.	Severe: floods, seepage, wetness.	Severe: floods, seepage, wetness.	Poor: seepage, too sandy, wetness.
LaB, LaC Lakeland	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Le Leefield	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: wetness.
Mn Mascotte	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Poor: wetness.
Oc Ocilla	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: wetness.
Of Ocilla	Severe: floods, wetness.	Severe: seepage, floods, wetness.	Severe: floods, wetness.	Severe: floods, seepage, wetness.	Fair: wetness.
OnA*:					
Ocilla	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: wetness.
Urban land.					
Os Olustee	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: wetness.	Poor: seepage, too sandy, wetness.
Pe Pelham	Severe: floods, wetness.	Severe: seepage, floods, wetness.	Severe: floods, wetness.	Severe: floods, seepage, wetness.	Poor: wetness.
Ra Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Se Stilson	Severe: wetness.	Severe: seepage, wetness.	Moderate: wetness.	Severe: seepage.	Fair: wetness.
StD2 Sunsweet	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
SuB Susquehanna	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
TfA, TfB Tifton	Moderate: percs slowly, wetness.	Moderate: seepage.	Slight	Slight	Fair: small stones.
TsC2 Tifton	Moderate: percs slowly, wetness.	Moderate: slope, seepage.	Slight	Slight	Fair: small stones.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
TuB*:					
Tifton	Moderate: percs slowly, wetness.	Moderate: slope, seepage.	Slight	Slight	Fair: small stones.
Urban land.					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable"]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Ah: Alapaha	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
An*:				
Alapaha	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Urban land.				
AoA: Albany	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
ArA: Ardilla	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
CaB2, CaC2: Carnegie	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Cn: Clarendon	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
CoB, CrC2: Cowarts	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
DoA, DoB: Dothan	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
EuB, EuC: Esto	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
FsB: Fuquay	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Gr: Grady	Poor: ponding.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
KeC: Kershaw	Good	Probable	Improbable: too sandy.	Poor: too sandy.
KO*:				
Kinston	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Osier	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
LaB, LaC: Lakeland	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Le: Leefield	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Mn: Mascotte	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
Oc, Of: Ocilla	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
OnA*:				
Ocilla	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Urban land.				
Os Olustee	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: too sandy, wetness.
Pe Pelham	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Ra Rains	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Se Stilson	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones.
StD2 Sunsweet	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
SuB Susquehanna	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
TfA, TfB, TsC2 Tifton	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
TuB*:				
Tifton	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Urban land.				

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--WATER MANAGEMENT

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

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
Ah: Alapaha	Severe: seepage.	Severe: wetness.	Floods	Wetness, droughty, floods.	Wetness	Wetness, droughty.
An*:						
Alapaha	Severe: seepage.	Severe: wetness.	Floods	Wetness, droughty, floods.	Wetness	Wetness, droughty.
Urban land.						
AoA: Albany	Severe: seepage.	Severe: seepage, piping, wetness.	Cutbanks cave	Wetness, droughty.	Wetness, too sandy.	Wetness, droughty.
ArA: Ardilla	Moderate: seepage.	Severe: wetness.	Favorable	Wetness	Wetness	Wetness.
CaB2, CaC2: Carnegie	Slight	Slight	Deep to water	Slope	Favorable	Favorable.
Cn: Clarendon	Moderate: seepage.	Moderate: wetness.	Favorable	Wetness	Wetness	Favorable.
CoB, CrC2: Cowarts	Slight	Slight	Deep to water	Percs slowly, slope.	Percs slowly	Percs slowly.
DoA: Dothan	Moderate: seepage.	Slight	Deep to water	Favorable	Favorable	Favorable.
DoB: Dothan	Moderate: seepage.	Slight	Deep to water	Slope	Favorable	Favorable.
EuB, EuC: Esto	Slight	Severe: hard to pack.	Deep to water	Percs slowly, slope.	Percs slowly	Percs slowly.
FsB: Fuquay	Moderate: seepage.	Moderate: piping.	Deep to water	Droughty	Too sandy	Droughty.
Gr: Grady	Slight	Severe: ponding.	Ponding, percs slowly.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
KeC: Kershaw	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, slope.	Too sandy	Droughty.
KO*:						
Kinston	Moderate: seepage.	Severe: wetness.	Floods	Wetness, floods.	Wetness	Wetness.
Osier	Severe: seepage.	Severe: seepage, piping, wetness.	Floods, cutbanks cave.	Wetness, droughty, floods.	Wetness, too sandy.	Wetness, droughty.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
LaB, LaC: Lakeland	Severe: seepage.	Severe: seepage.	Deep to water	Droughty	Too sandy	Droughty.
Le: Leefield	Moderate: seepage.	Severe: piping, wetness.	Favorable	Wetness, droughty.	Wetness	Droughty.
Mn: Mascotte	Severe: seepage.	Severe: piping, wetness.	Favorable	Wetness, droughty.	Wetness, too sandy.	Wetness, droughty.
Oc: Ocilla	Severe: seepage.	Severe: piping, wetness.	Favorable	Wetness, droughty.	Wetness	Droughty.
Of: Ocilla	Severe: seepage.	Severe: piping, wetness.	Floods	Wetness, droughty.	Wetness	Droughty.
OnA*:						
Ocilla	Severe: seepage.	Severe: piping, wetness.	Favorable	Wetness, droughty.	Wetness	Droughty.
Urban land.						
Os: Olustee	Severe: seepage.	Severe: wetness.	Favorable	Wetness, droughty.	Wetness, too sandy.	Wetness, droughty.
Pe: Pelham	Severe: seepage.	Severe: piping, wetness.	Floods	Wetness, droughty, floods.	Wetness	Wetness, droughty.
Ra: Rains	Moderate: seepage.	Severe: piping, wetness.	Favorable	Wetness	Wetness	Wetness.
Se: Stilson	Moderate: seepage.	Severe: piping.	Favorable	Wetness, droughty.	Wetness	Droughty.
StD2: Sunsweet	Slight	Slight	Deep to water	Droughty, slope.	Slope, erodes easily.	Slope, erodes easily, droughty.
SuB: Susquehanna	Slight	Severe: hard to pack.	Percs slowly, slope.	Percs slowly, slope.	Percs slowly	Percs slowly.
TfA, TfB: Tifton	Moderate: seepage.	Slight	Deep to water	Favorable	Favorable	Favorable.
TsC2: Tifton	Moderate: seepage.	Slight	Deep to water	Slope	Favorable	Favorable.
TuB*:						
Tifton	Moderate: seepage.	Slight	Deep to water	Favorable	Favorable	Favorable.
Urban land.						

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
Ah---------- Alapaha	0-30	Loamy sand-------	SM	A-2	0	100	99-100	70-95	15-31	---	NP
	30-42	Sandy loam, sandy clay loam.	SC, SM-SC	A-2, A-4	0	99-100	98-100	70-95	30-45	19-30	5-10
	42-80	Sandy clay loam	SC	A-2, A-4, A-6	0	93-100	88-100	66-90	29-40	20-30	7-22
An*:											
Alapaha---------	0-30	Loamy sand-------	SM	A-2	0	100	99-100	70-95	15-31	---	NP
	30-42	Sandy loam, sandy clay loam.	SC, SM-SC	A-2, A-4	0	99-100	98-100	70-95	30-45	19-30	5-10
	42-80	Sandy clay loam	SC	A-2, A-4, A-6	0	93-100	88-100	66-90	29-40	20-30	7-22
Urban land.											
AoA---------- Albany	0-53	Sand----------	SM	A-2	0	100	100	75-90	12-23	---	NP
	53-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM, SM-SC	A-2, A-4, A-6	0	97-100	95-100	70-100	25-50	<40	NP-17
ArA---------- Ardilla	0-17	Loamy sand-------	SM	A-2	0	98-100	95-100	80-90	20-35	---	NP
	17-46	Sandy clay loam, sandy loam.	SM, SM-SC, SC	A-2, A-4	0	98-100	95-100	75-90	30-45	<30	NP-8
	46-65	Sandy clay loam, sandy clay.	SM, SM-SC, SC	A-4, A-6	0	95-100	90-100	70-90	36-50	<35	NP-15
CaB2, CaC2------- Carnegie	0-5	Sandy loam-------	SM, SM-SC	A-2	0	95-100	90-95	51-75	13-30	<25	NP-5
	5-19	Sandy clay-------	CL	A-6, A-7, A-4	0	95-100	90-99	90-95	65-70	36-49	13-25
	19-46	Sandy clay-------	CL	A-6, A-7	0	92-100	90-98	89-98	63-76	36-49	13-25
	46-65	Sandy clay-------	CL	A-7, A-6	0	99-100	98-100	90-98	68-79	36-49	13-25
Cn---------- Clarendon	0-14	Loamy sand-------	SM, SP-SM	A-2	0	98-100	92-100	65-90	10-30	<20	NP-3
	14-40	Sandy clay loam	SC, CL, SM-SC, CL-ML	A-4, A-6	0	98-100	92-100	75-95	36-55	20-40	5-15
	40-65	Sandy clay loam, sandy loam, sandy clay.	SC, CL, SM-SC, CL-ML	A-2, A-4, A-6	0	99-100	96-100	80-95	25-55	<40	NP-15
CoB---------- Cowarts	0-9	Loamy sand-------	SM	A-2	0	90-100	85-100	50-80	13-30	---	NP
	9-24	Fine sandy loam, sandy loam, sandy clay loam.	SM-SC, SC, SM	A-2, A-4, A-6	0	95-100	90-100	60-90	23-45	20-40	NP-15
	24-30	Sandy clay loam, sandy clay.	SC	A-6, A-7	0	95-100	90-100	60-90	25-50	30-54	11-23
	30-65	Sandy loam, sandy clay loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6, A-7	0	85-100	80-100	60-95	30-58	25-53	5-20
CrC2---------- Cowarts	0-5	Sandy loam-------	SM, SM-SC	A-2, A-4	0	95-100	90-100	75-90	20-40	<20	NP-5
	5-20	Fine sandy loam, sandy loam, sandy clay loam.	SM-SC, SC, SM	A-2, A-4, A-6	0	95-100	90-100	60-90	23-45	20-40	NP-15
	20-26	Sandy clay loam, sandy clay.	SC	A-6, A-7	0	95-100	90-100	60-90	25-50	30-54	11-23
	26-62	Sandy loam, sandy clay loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6, A-7	0	85-100	80-100	60-95	30-58	25-53	5-20
DoA, DoB--------- Dothan	0-13	Loamy sand-------	SM	A-2	0	95-100	92-100	60-80	13-30	---	NP
	13-37	Sandy clay loam, sandy loam.	SM-SC, SC, SM	A-2, A-4, A-6	0	95-100	92-100	68-90	23-45	<40	NP-15
	37-74	Sandy clay loam, sandy clay.	SM-SC, SC, SM	A-2, A-4, A-6, A-7	0	95-100	92-100	70-95	30-50	25-45	4-21

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
EuB, EuC---------- Esto	0-6	Sandy loam--------	SM, SM-SC, ML, CL-ML	A-4, A-2	0	95-100	95-100	70-96	34-55	<25	NP-4
	6-12	Clay loam, sandy clay, sandy clay loam.	CL, SC	A-6, A-7	0	95-100	95-100	90-100	45-90	35-50	12-25
	12-65	Clay loam, clay, sandy clay.	CL, CH	A-6, A-7	0	95-100	95-100	90-100	51-98	35-80	18-52
FsB---------- Fuquay	0-32	Loamy sand--------	SP-SM, SM	A-2, A-3	0	95-100	90-100	50-83	5-35	---	NP
	32-40	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	85-100	80-100	70-90	23-45	<30	NP-13
	40-80	Sandy clay loam	SC	A-2, A-4, A-6	0	85-100	80-100	60-93	28-50	20-49	8-25
Gr---------- Grady	0-8	Sandy loam--------	SM, ML, CL-ML, SM-SC	A-4, A-6	0	100	99-100	85-100	40-75	<30	NP-15
	8-18	Clay loam, sandy clay loam, loam.	CL	A-6	0	100	100	90-100	51-80	25-40	11-20
	18-65	Clay, sandy clay	CL, ML, CH	A-6, A-7	0	100	100	90-100	55-90	30-51	12-25
KeC---------- Kershaw	0-90	Coarse sand--------	SP, SP-SM, SW	A-2, A-3	0	98-100	98-100	50-80	1-7	---	NP
KO*:											
Kinston----------	0-16	Fine sandy loam	SM, SC, SM-SC	A-2, A-4	0	100	98-100	55-80	25-50	<25	NP-8
	16-60	Loam, clay loam, sandy clay loam.	CL	A-4, A-6, A-7	0	100	95-100	75-100	60-95	20-45	8-22
Osier----------	0-6	Fine sandy loam	SM	A-2	0	100	98-100	70-90	13-25	---	NP
	6-58	Sand, loamy sand, loamy fine sand.	SP-SM, SM	A-2, A-3	0	100	95-100	65-90	5-20	---	NP
	58-65	Coarse sand, sand, fine sand.	SP, SP-SM	A-1, A-3	0	100	90-100	40-60	2-10	---	NP
LaB, LaC---------- Lakeland	0-60	Sand----------	SP-SM	A-3, A-2-4	0	90-100	90-100	60-100	5-12	---	NP
	60-85	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	90-100	90-100	50-100	1-12	---	NP
Le---------- Leefield	0-25	Loamy sand--------	SM, SW-SM, SP-SM	A-2	0	98-100	95-100	65-95	10-20	---	NP
	25-30	Sandy loam, sandy clay loam.	SC, SM, SM-SC	A-2, A-4, A-6	0	95-100	93-100	65-95	20-40	<40	NP-16
	30-80	Sandy loam, sandy clay loam.	SC, SM, SM-SC	A-2, A-4, A-6	0	95-100	95-100	65-90	20-40	<40	NP-20
Mn---------- Mascotte	0-10	Sand----------	SP-SM	A-3, A-2-4	0	100	100	85-100	5-12	---	NP
	10-20	Fine sand, sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	85-100	8-15	---	NP
	20-28	Fine sand, sand, loamy fine sand.	SP-SM	A-3, A-2-4	0	100	100	85-100	5-12	---	NP
	28-62	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM-SC, SM	A-2, A-4, A-6	0	100	100	85-100	19-45	<38	NP-15
Oc, Of---------- Ocilla	0-32	Loamy sand--------	SM, SP-SM	A-2, A-3	0	100	95-100	75-100	8-35	---	NP
	32-68	Sandy loam, sandy clay loam.	SM, CL, SC	A-2, A-4, A-6	0	100	95-100	80-100	30-55	<40	NP-18
OnA*:											
Ocilla----------	0-32	Loamy sand--------	SM, SP-SM	A-2, A-3	0	100	95-100	75-100	8-35	---	NP
	32-68	Sandy loam, sandy clay loam.	SM, CL, SC	A-2, A-4, A-6	0	100	95-100	80-100	30-55	<40	NP-18
Urban land.											

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
Os---------- Olustee	0-8	Sand----------	SP-SM, SM	A-3, A-2-4	0	100	100	75-100	5-15	---	NP
	8-20	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	75-100	8-15	---	NP
	20-34	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	75-100	5-15	---	NP
	34-65	Sandy clay loam, sandy loam.	SC	A-2, A-4, A-6	0	100	100	85-100	30-45	25-38	8-15
Pe---------- Pelham	0-26	Loamy sand-------	SM	A-2	0	100	95-100	75-90	15-30	---	NP
	26-48	Sandy clay loam, sandy loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	100	95-100	65-90	30-50	15-30	2-12
	48-80	Sandy clay loam, sandy loam, sandy clay.	SC, SM-SC, ML, CL	A-2, A-4, A-6, A-7	0	100	95-100	65-90	30-65	15-45	5-20
Ra---------- Rains	0-12	Loamy fine sand	SM	A-2	0	100	95-100	60-98	15-35	<30	NP-4
	12-48	Sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	100	98-100	65-98	30-70	18-40	4-18
	48-65	Sandy clay loam, clay loam, sandy clay.	SC, SM-SC, CL, CL-ML	A-4, A-6, A-7	0	100	98-100	65-98	36-72	18-45	4-22
Se---------- Stilson	0-25	Loamy sand-------	SM	A-2	0	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	0	89-100	86-100	77-94	28-41	<29	NP-13
	45-64	Sandy loam, sandy clay loam.	SM, SC SM-SC	A-2, A-6	0	96-100	95-100	70-99	30-50	<40	NP-20
StD2---------- Sunsweet	0-4	Gravelly sandy loam.	SM	A-2	0	80-100	55-92	45-90	17-30	---	NP
	4-12	Clay, sandy clay, sandy clay loam.	CL, SC	A-6, A-7, A-4	0	95-100	90-100	80-97	40-70	30-41	8-16
	12-66	Clay, sandy clay	CL	A-6, A-7	0	95-100	92-100	90-99	55-80	36-47	13-24
SuB---------- Susquehanna	0-6	Sandy loam-------	ML, SM	A-4	0	100	100	65-90	40-55	---	NP
	6-84	Clay, silty clay loam, silty clay.	CH	A-7	0	100	100	88-100	80-98	50-90	28-56
TfA, TfB--------- Tifton	0-10	Loamy sand-------	SM, SP-SM	A-2	0	70-96	62-94	53-85	11-27	---	NP
	10-14	Sandy loam, sandy clay loam.	SM, SM-SC	A-2	0	70-95	56-89	55-89	20-35	<25	NP-7
	14-39	Sandy clay loam	SC, CL	A-2, A-6	0	70-98	65-94	60-89	22-53	22-40	10-22
	39-72	Sandy clay loam, sandy clay.	SC, CL	A-2, A-6, A-7, A-4	0	87-100	80-99	50-94	34-55	24-45	8-23
TsC2---------- Tifton	0-6	Sandy loam-------	SM, SM-SC	A-2	0	70-95	60-89	55-89	15-30	<20	NP-6
	6-14	Sandy loam, sandy clay loam.	SM, SM-SC	A-2	0	70-95	56-89	55-89	20-35	<25	NP-7
	14-31	Sandy clay loam	SC, CL	A-2, A-6	0	70-98	65-94	60-89	22-53	22-40	10-22
	31-65	Sandy clay loam, sandy clay.	SC, CL	A-2, A-6, A-7, A-4	0	87-100	80-99	50-94	34-55	24-45	8-23
TuB*:											
Tifton----------	0-10	Loamy sand-------	SM, SP-SM	A-2	0	70-96	62-94	53-85	11-27	---	NP
	10-14	Sandy loam, sandy clay loam.	SM, SM-SC	A-2	0	70-95	56-89	55-89	20-35	<25	NP-7
	14-39	Sandy clay loam	SC, CL	A-2, A-6	0	70-98	65-94	60-89	22-53	22-40	10-22
	39-72	Sandy clay loam, sandy clay.	SC, CL	A-2, A-6, A-7, A-4	0	87-100	80-99	50-94	34-55	24-45	8-23
Urban land.											

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
Ah---------- Alapaha	0-30	4-10	---	6.0-20	0.05-0.08	4.5-5.5	Low----------	0.10	5	1-2
	30-42	15-30	---	0.6-2.0	0.10-0.13	4.5-5.5	Low----------	0.24		
	42-80	20-30	---	0.2-0.6	0.08-0.10	4.5-5.5	Low----------	0.28		
An*:										
Alapaha---------	0-30	4-10	---	6.0-20	0.05-0.08	4.5-5.5	Low----------	0.10	5	1-2
	30-42	15-30	---	0.6-2.0	0.10-0.13	4.5-5.5	Low----------	0.24		
	42-80	20-30	---	0.2-0.6	0.08-0.10	4.5-5.5	Low----------	0.28		
Urban land.										
AoA---------- Albany	0-53	5-10	---	6.0-20	0.02-0.04	3.6-6.5	Low----------	0.10	5	1-2
	53-62	15-35	---	0.6-2.0	0.10-0.16	4.5-6.0	Low----------	0.24		
ArA---------- Ardilla	0-17	4-17	---	2.0-6.0	0.08-0.11	4.5-5.5	Low----------	0.24	5	.5-2
	17-46	18-35	---	0.6-2.0	0.10-0.14	4.5-5.5	Low----------	0.28		
	46-65	20-40	---	0.2-0.6	0.10-0.15	4.5-5.5	Low----------	0.28		
CaB2, CaC2------- Carnegie	0-5	3-8	---	2.0-6.0	0.05-0.08	4.5-6.0	Low----------	0.28	3	1-2
	5-19	36-43	---	0.2-0.6	0.10-0.14	4.5-5.5	Low----------	0.32		
	19-46	36-51	---	0.2-0.6	0.10-0.12	4.5-5.5	Low----------	0.28		
	46-65	36-55	---	0.2-0.6	0.10-0.12	4.5-5.5	Low----------	0.28		
Cn---------- Clarendon	0-14	2-10	1.40-1.60	2.0-6.0	0.08-0.12	4.5-6.5	Low----------	0.15	5	.5-3
	14-40	18-35	1.40-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.20		
	40-65	15-40	1.40-1.70	0.2-0.6	0.08-0.12	4.5-5.5	Low----------	0.15		
CoB---------- Cowarts	0-9	3-10	---	2.0-6.0	0.06-0.10	4.5-5.5	Low----------	0.20	3	<1
	9-24	10-30	---	0.6-2.0	0.10-0.14	4.5-5.5	Low----------	0.28		
	24-30	25-40	---	0.2-2.0	0.10-0.16	4.5-5.5	Low----------	0.28		
	30-65	---	---	0.06-0.6	0.08-0.12	4.5-5.5	Low----------	0.24		
CrC2---------- Cowarts	0-5	5-20	---	2.0-6.0	0.08-0.13	4.5-5.5	Low----------	0.24	3	<1
	5-20	10-30	---	0.6-2.0	0.10-0.14	4.5-5.5	Low----------	0.28		
	20-26	25-40	---	0.2-2.0	0.10-0.16	4.5-5.5	Low----------	0.28		
	26-62	---	---	0.06-0.6	0.08-0.12	4.5-5.5	Low----------	0.24		
DoA, DoB--------- Dothan	0-13	5-15	---	2.0-6.0	0.06-0.10	4.5-5.5	Very low-----	0.20	4	<.5
	13-37	18-35	---	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	0.28		
	37-74	18-40	---	0.2-0.6	0.08-0.12	4.5-5.5	Low----------	0.28		
EuB, EuC--------- Esto	0-6	8-20	---	2.0-6.0	0.11-0.15	4.5-5.5	Low----------	0.28	3	<1
	6-12	26-45	---	0.6-2.0	0.12-0.17	4.5-5.5	Moderate-----	0.32		
	12-65	35-60	---	0.06-0.2	0.12-0.18	4.5-5.5	Moderate-----	0.32		
FsB---------- Fuquay	0-32	2-10	1.60-1.70	>6.0	0.04-0.09	4.5-6.0	Low----------	0.15	5	.5-2
	32-40	10-35	1.40-1.60	0.6-2.0	0.12-0.15	4.5-6.0	Low----------	0.20		
	40-80	20-35	1.40-1.60	0.06-0.2	0.10-0.13	4.5-6.0	Low----------	0.20		
Gr---------- Grady	0-8	15-30	---	0.6-2.0	0.10-0.18	3.6-5.5	Low----------	0.10	5	---
	8-18	20-35	---	0.2-0.6	0.10-0.15	3.6-5.5	Low----------	0.10		
	18-65	45-65	---	0.06-0.2	0.12-0.16	3.6-5.5	Moderate-----	0.10		
KeC---------- Kershaw	0-90	1-3	---	>20	0.02-0.05	4.5-6.0	Very low-----	0.10	5	---

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	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/cm3	In/hr	In/in	pH				Pct
KO*:										
Kinston	0-16	5-15	1.2-1.4	2.0-6.0	0.13-0.19	4.5-6.0	Low	0.24	5	1-5
	16-60	18-35	1.4-1.5	0.6-2.0	0.14-0.18	4.5-5.5	Low	0.32		
Osier	0-6	10-15	---	6.0-20	0.10-0.15	4.5-6.0	Low	0.15	5	---
	6-58	5-10	---	6.0-20	0.03-0.10	4.5-6.0	Low	0.10		
	58-65	2-5	---	>20	0.02-0.05	4.5-6.0	Low	0.05		
LaB, LaC Lakeland	0-60	2-8	1.35-1.55	>20	0.05-0.08	4.5-6.0	Low	0.10	5	>1
	60-85	2-6	1.50-1.60	>20	0.03-0.08	4.5-6.0	Low	0.10		
Le Leefield	0-25	5-10	---	6.0-20	0.04-0.07	4.5-6.0	Low	0.10	5	1-2
	25-30	15-25	---	0.6-2.0	0.10-0.13	4.5-5.5	Low	0.15		
	30-80	15-30	---	0.2-0.6	0.08-0.12	4.5-5.5	Low	0.10		
Mn Mascotte	0-10	1-8	1.20-1.45	6.0-20	0.03-0.08	3.6-5.5	Very low	0.20	5	3-11
	10-20	5-12	1.35-1.50	0.6-2.0	0.10-0.15	3.6-5.5	Very low	0.20		
	20-28	2-8	1.35-1.50	6.0-20	0.03-0.08	3.6-5.5	Very low	0.20		
	28-62	14-35	1.45-1.65	0.6-2.0	0.10-0.15	3.6-5.5	Low	0.32		
Oc, Of Ocilla	0-32	4-10	---	2.0-20	0.05-0.08	4.5-5.5	Low	0.10	5	1-2
	32-68	15-35	---	0.6-2.0	0.09-0.12	4.5-5.5	Low	0.24		
OnA*:										
Ocilla	0-32	4-10	---	2.0-20	0.05-0.08	4.5-5.5	Low	0.10	5	1-2
	32-68	15-35	---	0.6-2.0	0.09-0.12	4.5-5.5	Low	0.24		
Urban land.										
Os Olustee	0-8	1-8	1.10-1.40	6.0-20	0.05-0.10	3.6-5.5	Very low	0.20	5	2-6
	8-20	2-8	1.35-1.55	0.6-2.0	0.10-0.15	3.6-5.5	Very low	0.20		
	20-34	2-8	1.35-1.50	6.0-20	0.03-0.08	4.5-5.5	Very low	0.20		
	34-65	18-35	1.45-1.65	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.32		
Pe Pelham	0-26	5-10	---	6.0-20	0.05-0.08	4.5-5.5	Very low	0.10	5	1-2
	26-48	15-30	---	0.6-2.0	0.10-0.13	4.5-5.5	Low	0.24		
	48-80	15-40	---	0.6-2.0	0.10-0.16	4.5-5.5	Low	0.24		
Ra Rains	0-12	2-10	1.40-1.70	6.0-20	0.07-0.10	4.5-6.5	Low	0.17	5	1-6
	12-48	18-35	1.30-1.50	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.24		
	48-65	18-40	1.30-1.50	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.28		
Se Stilson	0-25	3-8	---	6.0-20	0.06-0.09	4.5-5.5	Low	0.10	5	.5-1
	25-45	15-30	---	0.6-2.0	0.09-0.12	4.5-5.5	Low	0.24		
	45-64	18-35	---	0.6-2.0	0.08-0.10	4.5-5.5	Low	0.17		
StD2 Sunsweet	0-4	5-15	---	2.0-6.0	0.09-0.12	4.5-5.5	Low	0.32	2	.5-1
	4-12	34-55	---	0.2-0.6	0.07-0.10	4.5-5.5	Low	0.37		
	12-66	40-60	---	0.2-0.6	0.07-0.10	4.5-5.5	Low	0.28		
SuB Susquehanna	0-6	2-12	1.50-1.55	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.43	3	.5-2
	6-84	35-60	1.25-1.50	<0.06	0.15-0.20	4.5-5.5	High	0.32		
TfA, TfB Tifton	0-10	3-8	---	6.0-20	0.03-0.08	4.5-5.5	Low	0.05	4	<1
	10-14	13-22	---	6.0-20	0.08-0.12	4.5-5.5	Low	0.24		
	14-39	20-35	---	0.6-2.0	0.12-0.15	4.5-5.5	Low	0.24		
	39-72	25-40	---	0.2-0.6	0.10-0.13	4.5-5.5	Low	0.17		
TsC2 Tifton	0-6	10-20	---	6.0-20	0.06-0.10	4.5-5.5	Low	0.17	4	1-2
	6-14	13-22	---	6.0-20	0.08-0.12	4.5-5.5	Low	0.24		
	14-31	20-35	---	0.6-2.0	0.12-0.15	4.5-5.5	Low	0.24		
	31-65	25-40	---	0.2-0.6	0.10-0.13	4.5-5.5	Low	0.17		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	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/cm3	In/hr	In/in	pH				Pct
TuB*:										
Tifton----------	0-10	3-8	---	6.0-20	0.03-0.08	4.5-5.5	Low----------	0.05	4	<1
	10-14	13-22	---	6.0-20	0.08-0.12	4.5-5.5	Low----------	0.24		
	14-39	20-35	---	0.6-2.0	0.12-0.15	4.5-5.5	Low----------	0.24		
	39-72	25-40	---	0.2-0.6	0.10-0.13	4.5-5.5	Low----------	0.17		
Urban land.										

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
Ah---------- Alapaha	D	Occasional	Brief-----	Jan-Apr	0.5-1.5	Apparent	Dec-May	High-----	High.
An*:									
Alapaha----------	D	Occasional	Brief-----	Jan-Apr	0.5-1.5	Apparent	Dec-May	High-----	High.
Urban land.									
AoA---------- Albany	C	None--------	---	---	1.0-2.5	Apparent	Dec-Mar	High-----	High.
ArA---------- Ardilla	C	None--------	---	---	1.0-2.0	Apparent	Nov-Apr	High-----	High.
CaB2, CaC2-------- Carnegie	C	None--------	---	---	>6.0	---	---	Low------	Moderate.
Cn---------- Clarendon	C	None--------	---	---	1.5-2.5	Apparent	Dec-Mar	Moderate	High.
CoB, CrC2--------- Cowarts	C	None--------	---	---	>6.0	---	---	Moderate	Moderate.
DoA, DoB---------- Dothan	B	None--------	---	---	3.0-5.0	Perched	Jan-Apr	Moderate	Moderate.
EuB, EuC---------- Esto	B	None--------	---	---	>6.0	---	---	High-----	High.
FsB---------- Fuquay	B	None--------	---	---	4.0-6.0	Perched	Jan-Mar	Low------	High.
Gr---------- Grady	D	None--------	---	---	+2-1.0	Apparent	Dec-Jun	High-----	High.
KeC---------- Kershaw	A	None--------	---	---	>6.0	---	---	Low------	High.
KO*:									
Kinston----------	D	Common------	Brief-----	Dec-Apr	0-1.0	Apparent	Nov-Jun	High-----	High.
Osier----------	D	Common------	Brief-----	Dec-Apr	0-1.0	Apparent	Nov-Mar	High-----	High.
LaB, LaC---------- Lakeland	A	None--------	---	---	>6.0	---	---	Low------	Moderate.
Le---------- Leefield	C	None--------	---	---	1.5-2.5	Apparent	Dec-Mar	Moderate	High.
Mn---------- Mascotte	B/D	None--------	---	---	0-1.0	Apparent	Dec-Apr	High-----	High.
Oc---------- Ocilla	C	None--------	---	---	1.0-2.5	Apparent	Dec-Apr	High-----	Moderate.
Of---------- Ocilla	C	Occasional			1.0-2.5	Apparent	Dec-Apr	High-----	Moderate.
OnA*:									
Ocilla----------	C	None--------	---	---	1.0-2.5	Apparent	Dec-Apr	High-----	Moderate.
Urban land.									

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
Os---------- Olustee	B/D	None--------	---	---	0-1.0	Apparent	Dec-Apr	High-----	High.
Pe---------- Pelham	B/D	Occasional	Brief-----	Dec-Mar	0.5-1.5	Apparent	Jan-Apr	High-----	High.
Ra---------- Rains	B/D	None--------	---	---	0-1.0	Apparent	Nov-Apr	High-----	High.
Se---------- Stilson	B	None--------	---	---	2.5-3.0	Perched	Dec-Apr	Moderate	High.
StD2---------- Sunsweet	C	None--------	---	---	>6.0	---	---	Moderate	Moderate.
SuB---------- Susquehanna	D	None--------	---	---	>6.0	---	---	High-----	High.
TfA, TfB, TsC2---- Tifton	B	None--------	---	---	3.5-6.0	Perched	Jan-Feb	Low------	Moderate.
TuB*:									
Tifton----------	B	None--------	---	---	3.5-6.0	Perched	Jan-Feb	Low------	Moderate.
Urban land.									

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--ENGINEERING INDEX TEST DATA

[Dashes indicate data were not available. NP means nonplastic]

Soil name, report number, horizon, and depth in inches	Classification		Grain-size distribution										Liquid limit	Plasticity index	Moisture density		Percentage volume change		
			Percentage passing sieve--							Percentage smaller than--									
	AASHTO	Unified	2 inch	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			Max. dry density	Optimum moisture	Total	Swell	Shrink
													Pct		Lb/ Ft3	Pct	Pct	Pct	Pct
Fuquay loamy sand:[1] (S71GA-137-001)																			
A2--------6 to 29	A-2-4(00)	SM	100	100	100	100	98	83	17	7	4	3	--	NP	114	8	2.2	1.8	0.4
B21t-----32 to 42	A-2-6(00)	SC	100	99	90	85	82	69	28	20	16	16	29	13	123	11	3.1	1.9	1.2
B22t-----42 to 62	A-6 (03)	SC	100	100	100	99	98	93	50	34	30	28	33	12	108	17	8.6	5.1	3.5
Sunsweet gravelly sandy loam:[2] (S71GA-137-002)																			
Apcn------0 to 4	A-2-4(00)	SM	100	100	94	80	74	58	18	11	9	7	--	NP	124	9	5.6	4.2	1.4
B24t-----20 to 62	A-7-6(13)	CL	100	100	100	100	100	97	70	60	54	46	44	19	106	23	15.3	7.2	8.1

[1]Fuquay loamy sand:
East road bank, 1.9 mi E. of Chula on county rd.; 0.4 mi S. on county rd.

[2]Sunsweet gravelly sandy loam:
In a pasture, 3.3 mi E. of Omega on county rd.; 40 ft N. of rd.

TABLE 19.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Alapaha	Loamy, siliceous, thermic Arenic Plinthic Paleaquults
Albany	Loamy, siliceous, thermic Grossarenic Paleudults
Ardilla	Fine-loamy, siliceous, thermic Fragiaquic Paleudults
Carnegie	Clayey, kaolinitic, thermic Plinthic Paleudults
Clarendon	Fine-loamy, siliceous, thermic Plinthaquic Paleudults
Cowarts	Fine-loamy, siliceous, thermic Typic Hapludults
Dothan	Fine-loamy, siliceous, thermic Plinthic Paleudults
Esto	Clayey, kaolinitic, thermic Typic Paleudults
Fuquay	Loamy, siliceous, thermic Arenic Plinthic Paleudults
Grady	Clayey, kaolinitic, thermic Typic Paleaquults
Kershaw	Thermic, uncoated Typic Quartzipsamments
Kinston	Fine-loamy, siliceous, acid, thermic Typic Fluvaquents
Lakeland	Thermic, coated Typic Quartzipsamments
Leefield	Loamy, siliceous, thermic Arenic Plinthaquic Paleudults
Mascotte	Sandy, siliceous, thermic Ultic Haplaquods
Ocilla	Loamy, siliceous, thermic Aquic Arenic Paleudults
Olustee	Sandy, siliceous, thermic Ultic Haplaquods
Osier	Siliceous, thermic Typic Psammaquents
Pelham	Loamy, siliceous, thermic Arenic Paleaquults
Rains	Fine-loamy, siliceous, thermic Typic Paleaquults
Stilson	Loamy, siliceous, thermic Arenic Plinthic Paleudults
Sunsweet	Clayey, kaolinitic, thermic Plinthic Paleudults
Susquehanna	Fine, montmorillonitic, thermic Vertic Paleudalfs
Tifton	Fine-loamy, siliceous, thermic Plinthic Paleudults

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